S-1
Effects of Hormone Therapy on Heart Fat and Atherosclerosis Progression in Recently Postmenopausal Women from KEEPS Trial
Sumit R. El Khoudary, PhD, MPH, Qian Zhao, JoAnn E. Manson, Maria M. Brooks, Nanette Santoro, Dennis M. Black, Mitchell Harman, Marcelle I. Cedars, Paul N. Hopkins, Ann E. Kearns, Virginia Miller, Hugh S. Taylor, Matthew J. Budoff, University of Pittsburgh, Pittsburgh, PA; 2Harvard Medical School and Brigham and Women’s Hospital, Boston, MA; 3University of California San Francisco, San Francisco, CA; 4Los Angeles Biomedical Research Institute, Torrance, CA; 5Mayo Clinic, Rochester, MN; 6Phoenix Veterans Affairs Health Care System, Phoenix, AZ; 7University of Utah Health, Salt Lake City, UT; 8University of Arizona, Tucson, AZ; 9Yale University, New Haven, CT

Objective: Heart fat depots, within [epicardial adipose tissue (EAT)] and outside [paracardial adipose tissue (PAT)] the pericardium, have been linked to increased cardiovascular disease risk. Postmenopausal women have greater volumes of heart fat than premenopausal women. Recent evidence suggests a role of endogenous estrogen in heart fat accumulation, possibly limited to PAT. The impact of hormone therapy (HT) on heart fat build-up is unknown. We evaluated the differential effects of HT on the accumulation of heart fat depots and their associations with coronary artery calcification (CAC) progression in recently postmenopausal women.

Design: KEEPS was a multi-center, randomized, clinical trial of the effects of oral conjugated equine estrogens (o-CEE) and transdermal 17β-estradiol (t-E2), both with progesterone, compared to placebo, on 46-month subclinical atherosclerosis progression in recently postmenopausal women. Heart fat volumes and CAC were measured on CT scans at baseline and 48 months later. Significant CAC progression was defined as present if (1) baseline CAC score = 0 and 48 month CAC Agatston score > 0; (2) baseline CAC score > 0 and annualized change in CAC score ≥ 10; or (3) baseline CAC score ≥ 100 and annualized percent change in CAC score ≥ 10%.

Changes in heart fat depots were tested using Wilcoxon signed test and compared by treatment group using Kruskal–Wallis test. Associations between change in heart fat volumes and CAC progression as well as effect modification by HT type were tested using logistic regression adjusting for age, race, study site, education, physical activity, smoking, alcohol intake, lipids, systolic blood pressure, waist circumference, anti-hypertensive medications and baseline heart fat volume.

Results: Of 727 randomly assigned women, 474 [mean age (SD): 52.7 (6.2); 78.1% White] had heart fat volumes and CAC scores at baseline and 48 months. EAT volume significantly increased over time in the placebo group [median (Q1, Q3): 2.12(-4.58, 6.36) cm³, P<0.003] but not in the o-CEE [0.05(-5.93, 6.12) cm³, P=0.99] or the t-E2 group [1.68(-4.07, 4.91) cm³, P=0.07]. PAT volume did not change significantly in any group. Changes in EAT and PAT did not vary by treatment group. KEEPS only included women whose screening CAC score was < 50, resulting in 88.4% of participants having CAC=0 at baseline. At 48 month CAC progressed in 14% of the study participants. Changes in EAT and PAT were not significantly associated with CAC progression overall. However, assigned treatment significantly modified the association between changes in PAT and CAC progression in adjusted model, P=0.02, so that changes in PAT were associated with greater CAC progression risk only in the t-E2 group (OR [95% CI] per 1 SD of PAT change: 2.8(1.3, 5.9)).

Conclusion: There was no significant difference among treatment groups in 48 month changes of heart fat depots. However, there was a suggestion that o-CEE slowed progress on heart fat accumulation, although not in the t-E2 group. Greater PAT changes were associated with greater CAC progression risk only in the t-E2 group. The current findings support the notion that heart fat accumulation is the result of a complex role played by heart fat depots and their associations with CAC progression in recently postmenopausal women.

S-2
Effects of Single-Capsule 17β-Estradiol/Progesterone (TX-001HR) on Metabolic Parameters and Cardiovascular Outcomes in Menopausal Women of the REPLENISH Trial
Rogerio Lobo, MD, James Liu, MD, Andrew M. Kaunitz, MD, Brian Bernick, MD, Lisa C. Larkin MD, MD, Andrew M. Kaunitz, MD, James Liu, MD, Shelli Graham, PhD, Brian Bernick, MD, Sebastian Mirkin, MD, Ginger Constance, PhD, University of Pittsburgh, Pittsburgh, PA; 2Harvard Medical School and Brigham and Women’s Hospital, Boston, MA; 3TherapeuticsMD, Boca Raton, FL; 4EndoRheum Consultants, LLC, Malvern, PA; 5EndoRheum Consultants, LLC, Malvern, PA; 6University of Colorado, Aurora, CO; 7University of California San Francisco, San Francisco, CA; 8Los Angeles Biomedical Research Institute, Torrance, CA; 9Yale University, New Haven, CT

Objective: Coronary heart disease (CHD) adverse events considered not related to treatment: unstable angina angina, and angiography and coronary artery disease in another (E2/P4 1/0). The woman who experienced unstable angina also experienced subarachnoid hemorrhage and cerebral infarction, neither considered related treatment.

One case of deep vein thrombosis (DVT) with E2/P4 0.5/0.5 was reported in a woman with a family history of DVT. Conclusion: Twelve months of TX-001HR treatment in menopausal women with VMS and an intact uterus had minimal clinically meaningful effects on lipid, glucose, or coagulation parameters. Observed changes in triglyceride levels, antithrombin activity, factor XIV, and protein S were consistent with oral estrogen therapy. Although this trial lacked statistical power to assess these outcomes, VTE rates, cardiovascular disease, and cerebrovascular events were as expected for a postmenopausal population. If approved, TX-001HR may provide the first oral combination of E2/P4 for the treatment of VMS in menopausal women with a uterus.

Sources of Funding: TherapeuticsMD

Mean ± SD

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<th>E2/P4</th>
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<th>n=151</th>
<th>n=151</th>
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<td>E2 (ng/ml)</td>
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<td>24.8±7.0</td>
<td>25.3±7.1</td>
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<tr>
<td>P4 (pg/ml)</td>
<td>25.3±7.1</td>
<td>24.8±7.0</td>
<td>25.3±7.1</td>
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</tr>
</tbody>
</table>

aPTT: activated partial thromboplastin time; INR: international normalized ratio.

S-3
Evaluation of Systemic Effects of a Vaginal Estradiol Softgel Capsule (TX-004HR) in Menopausal Women with Moderate to Severe Vasomotor Symptoms
Lisa C. Larkin MD, MD, Andrew M. Kaunitz, MD, James Liu, MD, Shelli Graham, PhD, Brian Bernick, MD, Sebastian Mirkin, MD, Ginger Constance, MD, University of Pittsburgh, Pittsburgh, PA; 2Harvard Medical School and Brigham and Women’s Hospital, Boston, MA; 3TherapeuticsMD, Boca Raton, FL; 4EndoRheum Consultants, LLC, Malvern, PA; 5Larson MD Associates, Maricopa, OH

Objective: TX-004HR (an investigational vaginal softgel capsule of low-dose, solubilized 17β-estradiol, designed to be mucoadhesive and rapidly dissolving) significantly improved vaginal physiology and dyspareunia (primary endpoints) as well as dryness (secondary endpoint) in menopausal women with moderate to severe dyspareunia as they comprised of bothersome symptoms in the phase 3 REJOICE trial (NCT02253173). Improvements were achieved with negligible to very low systemic absorption of estradiol with doses of 4 µg, 10 µg and 25 µg (the 4 µg and 10 µg doses have been submitted for FDA approval). Systemic levels of estradiol with 10 µg and 25 µg doses remained too low to be measured but higher than with 4 µg dose of a commercial available estradiol tablet (Vagifem®) in head-to-head studies. This report summarizes the effects of TX-004HR on clinical outcomes that are reported to have been significantly
Effect of age, time since menopause and previous hormone therapy on the response to intravaginal 6.5 mg prasterone

S-4. Effect of age, time since menopause and previous hormone therapy on the response to intravaginal 6.5 mg prasterone

David Archer, MD1, Fernand Labrie2, Celine Martel2, Érick Moyneur3. 1CONRAD Clinical Research Center, Norfolk, VA; 2Endoceutics Inc., Quebec, QC, Canada; 3Statlog Economics Inc., Montréal, QC, Canada

Objective: To analyze the effect of intravaginal 6.5 mg prasterone (Intra rat®) in subgroups who participated in the clinical trials performed with women suffering from moderate to severe (MS) pain at sexual activity (dyspareunia) identified as their most bothersome symptom (MBS) of vulvovaginal atrophy (VVA). This analysis intends to assess the potential influence of age, time since menopause, and previous hormone therapy (HRT) on the response to treatment. Design: Data obtained from two independent prospective, randomized, double-blind and placebo-controlled clinical trials were combined to evaluate the effect of daily intravaginal 6.5 mg (0.5%) prasterone administered for 12 weeks on MS/MBS dyspareunia in different subgroups of women depending on their age (≥ 55 yrs and a 56 yrs), time since menopause (1-2 yrs, 3-5 yrs and a 6 yrs) and who had or not received previous HRT. Results: In 406 women treated with 6.5 mg prasterone and 234 women who received placebo, the difference from placebo in the improvement of the severity score of MS/MBS dyspareunia was of 0.44 unit and 0.36 unit in women aged ≥ 55 yrs [n=123; 57] and a 56 yrs [n=283; 177], respectively. On the other hand, the improvement of MS/MBS dyspareunia was of 1.59, 0.59 and 0.27 unit for prasterone in comparison to placebo in women who were menopausal since 1-2 yrs [n=22; 11], 3-5 yrs [n=59; 27], and a 6 yrs [n=325; 196], respectively. Finally, women who previously received HRT [n=184; 113] before taking intravaginal prasterone had an improvement of their MS/MBS dyspareunia of 0.45 unit over placebo in comparison to a difference from placebo of 0.32 unit in women who did not receive HRT previously [n=222; 119]. Conclusion: No major influence of age and previous hormone therapy was observed in the response to intravaginal 6.5 mg prasterone (Intra rat®) on dyspareunia, smaller effect on dyspareunia observed with a longer time since menopause deserves further investigation in order to optimize treatment.

Sources of Funding: This study was funded by Endoceutics Inc.
menopause onset which suggests that AA women had a worse pre-menopause body adiposity profile yet maintained adiposity levels throughout the menopause transition while Caucasian women caught up in body adiposity.

Sources of Funding: NIH Grant #s: NIDDK-R01-DK50736A (PI: Lovejoy); NIDDK-T32-DK064584 (to Marlat); US4-GM104940 (LA CaTS). Registered trial on ClinicalTrials.gov (Healthy Transitions; NCT00412269).

S-7 Increased Anxiety and Depressive Symptoms Are Associated with Abnormal Resting Cardiac Autonomic Function in Peri- and Postmenopausal Women with Hot Flashes

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Objective: The menopause transition is marked by an increased prevalence of mood symptoms in midlife women, including anxiety and depression. Prior research in non-menopausal populations has suggested that both anxiety and depression may be associated with alterations in cardiac autonomic function that are in turn associated with cardiovascular disease or adverse cardiovascular outcomes. We aimed to examine whether anxiety and depressive symptoms are associated with an adverse cardiac autonomic profile among midlife women with hot flashes.

Design: The Menopausal Treatment Using Relaxation Exercise (MaTURE) trial was a parallel-group, single-blinded, randomized trial of slow-paced respiration for treatment of hot flashes in peri- and postmenopausal women, age 40 to 59 years old, with at least four hot flashes reported per day. Anxiety and depressive symptoms were assessed as continuous scores on multiple validated self-administered questionnaires. State anxiety (i.e., fluctuating, transitory emotional state in reaction to perceived threats) and trait anxiety (i.e., stable, individual tendency towards perceived threats) were measured using the Spielberger State Trait Anxiety Inventory (STAI). Cognitive anxiety (i.e., mental component of anxiety associated with fear of future adverse events) was assessed using the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS). Depressive symptoms were assessed using Beck Depression Inventory-II (BDI-II) and the depression subscale of HADS. Main outcomes of cardiac autonomic function included pre-ejection period (PEP) and respiratory sinus arrhythmia (RSA), both measured during a resting period at baseline and 12 weeks using impedance cardiography and electrocardiography. PEP, the time from the start of cardiac ventricular depolarization to the opening of aortic valve, is a marker of sympathetic activity. RSA, the variability of the heart rate during the typical respiratory cycle, is a marker of parasympathetic activity (i.e., cardiac vagal tone). Multivariable repeated measures linear regression models examined associations between anxiety, depressive symptoms, and cardiac autonomic markers, adjusted for age and body mass index.

Results: Among the 121 participants[H11] (mean age 53 years), 30% of women had significant differences in anxiety or depression scores were detected between the paced respiration and the music control groups at baseline or 12 weeks. Resting cardiac autonomic parameters were similar at baseline and at 12 weeks with no significant between-group differences. Greater trait anxiety and cognitive anxiety were associated with lower RSA, reflecting decreased parasympathetic activity (β=−0.03, p<0.01 for STAI Trait Anxiety; β=−0.06, p=0.01 for HADS Anxiety Subscale). Greater depressive symptoms were also associated with lower RSA (β=−0.03, p=0.02 for BDI-II; β=−0.06, p=0.02 for HADS Depression Subscale). Greater state anxiety was associated with shorter PEP, reflecting higher sympathetic activity (β=0.24, p<0.01), but no other significant associations between anxiety or depression and PEP were detected.

Conclusion: Among peri- and postmenopausal women with hot flashes, greater self-reported anxiety and depression were associated with lower levels of cardiac vagal tone, while greater state anxiety was associated with higher resting sympathetic nervous system activation. Findings suggest that midlife women with increased anxiety and depressive symptoms may have an unfavorable cardiac autonomic profile with potential implications for their overall cardiovascular risk.

Sources of Funding: This study was funded by grant #R01AT005491 from the National Center for Complementary and Integrative Health. Dr. Huang was supported by a Paul B. Beeson Career Development Award in Aging Research from National Institute on Aging (1K23AG05833) and the American Federation on Aging Research. Dr. Gibson was supported by an Advanced Fellowship in Women’s Health from the Veteran’s Affairs Office of Academic Affiliations.

S-8. Modifying Effect of ApoE4 Genotype on the Association Between Metabolic Phenotype and Subclinical Atherosclerosis in Postmenopausal Women

Intira Sripriart, MD1,2, Wendy Mack, PhD1,2, Howard Hodis1,2, Roksana Karim, PhD1,2 1Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, CA; 2Atherosclerosis Research Unit, Keck School of Medicine, University of Southern California, Los Angeles, CA; 3Obstetrics and Gynecology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Objective: Both metabolic risk factors and presence of ApoE4 genotype are known to have effects on coronary heart disease. We examined the interaction between these two factors for their associations with subclinical atherosclerosis among early and late postmenopausal women using baseline data from the Early versus Late Intervention Trial with Estradiol (ELITE). Design: Postmenopausal women from the ELITE trial with available ApoE4 genotype were included in the analysis. Women were categorized into healthy, high blood pressure, and poor metabolic clusters based on the levels of baseline glucose, the HOMA insulin sensitivity score, ketones, triglycerides, high density lipoprotein cholesterol, low density lipoprotein cholesterol, hemoglobin A1c, and systolic and diastolic blood pressure using k-means clustering analysis. ApoE4 genotype was classified as either ApoE4+ (homo- or heterozygous for E4 allele) or ApoE4-. General linear models were used to test whether the cross-sectional association between metabolic clusters and baseline common carotid intima media thickness (CIMIT) differed by ApoE4 genotype after adjusting for age. A longitudinal analysis was also performed using mixed effects analysis to evaluate the modifying role of ApoE4 genotype on the association between metabolic clusters and CIMIT progression over a median follow up of 4.8 years. Results: A total of 497 women with information on CIMIT, ApoE4 genotype (343 women with ApoE4+ and 154 women with ApoE4-) and metabolic clusters [healthy, 190 high blood pressure and 99 poor metabolic] were included in the analysis. In cross-sectional analysis among all women, ApoE4+ women in the poor metabolic cluster had the highest CIMIT(SE) of 832.41(17.45) μm, compared to other groups of women. In the ApoE4- group, CIMIT significantly differed between healthy and high blood pressure clusters (p=0.004) and in the ApoE4+ group, CIMIT was significantly higher in the poor metabolic cluster compared to healthy (p=0.0003) and high blood pressure (p=0.001) clusters. ApoE4 genotype significantly modified the effect of metabolic cluster on CIMIT (interaction p=0.001). In stratified analysis by early (<6 years) and late (≥10 years) postmenopause, the highest CIMIT was consistently seen in ApoE4+ women in the poor metabolic cluster in both early and late postmenopause strata. Among late postmenopausal women, metabolic cluster was significantly associated with CIMIT (p=0.04) and there was a significant synergistic effect of both factors on CIMIT (interaction p=0.02), whereas the interaction was marginally significant among the early menopausal women (interaction p=0.05). These results were not observed on longitudinal analysis of CIMIT with a median follow up of 4.8 years. Conclusion: ApoE4+ women with poor metabolic phenotype have higher levels of subclinical atherosclerosis, particularly when they are further from menopause. These results have significant clinical and public health implications as preventive intervention strategies targeted to these high risk women can substantially reduce the burden of coronary heart disease, which is the leading cause of death in women globally.

Sources of Funding: None

Table: CIMIT by metabolic clusters and ApoE4 genotype among early and late postmenopause strata

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<th>Genotype</th>
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<th>(2) High Blood Pressure</th>
<th>(3) Poor Metabolic</th>
<th>Parity p</th>
<th>ApoE4 p</th>
<th>Metabolic cluster p</th>
<th>Interaction p</th>
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<td>n=140</td>
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</table>
| CIMIT reported as μm; Model adjusted for age; Tukey-Kramer method as used to test for pairwise comparisons
Menstrual Cycle Length over the Menopause Transition is Associated with Subclinical Atherosclerosis after Menopause: The Study of Women’s Health Across the Nation Daily Hormone Study

Samar R. El Kouardy, PhD, MPH1, Xirun Chen1, Karen A. Matthews, PhD2, Amanda Allshouse2, Sybil Crawford1, Carol A. Derby3, Rebecca C. Thurston1, Rasa Kazlauskaite4, Nanette Santoro1, University of Pittsburgh, Pittsburgh, PA; University of Colorado, Aurora, CO; University of Massachusetts, Worcester, MA; Rush University Medical Center, Chicago, IL; Albert Einstein College of Medicine, Bronx, NY

Objective: Irregular menstrual cycles have been associated with cardiovascular disease (CVD) risk. Using data from the SWAN Daily Hormone Study (DHS), we characterized trajectories of menstrual cycle length over the menopause transition (MT) and tested whether these trajectories are associated with postmenopausal carotid atherosclerosis.

Design: SWAN DHS includes 875 participants who collected daily, first-morning voided urine for an entire menstrual cycle or up to 50 days, annually until post-menopause or for up to 10 years. This analysis includes DHS participants who became postmenopausal and had: a) an available final menstrual period (FMP) date; b) at least 2 annual DHS collections with cycle length recorded; and c) a postmenopausal measurement of carotid intima-media thickness (cIMT). Cycle length was defined as the number of days from the start of one cycle to the start of the next. Group-based trajectory modeling was used to characterize cycle length trajectories in relation to the FMP which then were linked to postmenopausal cIMT using linear regression. The final model included race/ethnicity, covariates collected concurrent with cIMT, and pre/early peri-menopausal CVD risk factors. Results: We evaluated 218 women with 862 cycles over the MT (mean age±SD at time of cIMT: 58.86±2.34 years). Three distinct cycle length trajectories were identified (Figure A-A): 1) Stable: 54.3% of study participants followed a stable cycle length trajectory up to their FMP, 2) Late-increase: 26.6% followed a late increase in cycle length trajectory as early as 2 years before as early as 5 years before the FMP. 3) Early-increase: 19.1% followed an early increase in cycle length trajectory as early as 5 years before the FMP. In final model, women with the late-increase pattern had significantly lower postmenopausal cIMT (mean±SD: 7.02±0.03 cm) than women with the stable pattern (0.77±0.02 cm, P=0.044). Pattern of late increase was similar for women with stable pattern did not differ from those with stable cycle length pattern (Figure B). Conclusion: Women who experienced a pattern of late increases in cycle length close to the FMP had less evidence of carotid atherosclerosis than those with more stable changes in cycle length. Patterns of cycle length over the MT appear to be a marker of vascular health that may help identify groups at greater risk of atherosclerosis after menopause.

Sources of Funding: SWAN has grant support from the NIH, DHHS, through the Sources of Funding:

TOP-SCORING ABSTRACT PRESENTATIONS

S-9. Does mindfulness moderate perceived stress and menopause-related symptoms in midlife women?

Richa Sood, MD MS FACP NCMP, Carol Kuhle, DO, Ekta Kapoor, MD, Jacqueline Thielen, MD, Karla Fratamore, PhD, Kristin Mara, Stephanie S. Faubion, MD, FACP, NCMP, IF: Mayo Clinic, Rochester, MN

Objective: Midlife women frequently experience stress. Stress can amplify menopause-related symptoms and adversely impact women’s quality of life. Mindfulness, a technique of paying attention on purpose, in the present moment, and non-judgmentally is thought to mitigate stress by decreasing emotional reactivity and maladaptive, negative ruminative thinking. In this study, we sought to assess the associations of mindfulness, menopause-related symptoms and perceived stress among midlife women. Design: In this cross-sectional study, 1744 women ages 40-65 years, who presented to the Women’s Health Clinic at Mayo Clinic, Rochester, MN between January 2015 and December 2016 were included. Participants completed the Menopause Rating Scale (MRS), Perceived Stress Scale-4 (PSS-4), and Mindfulness Attention Awareness Scale (MAAS) at the time of their clinical visit. The point biserial correlations between mindfulness, stress, and menopause symptom burden measures were assessed using correlation coefficients and linear regression. All statistical tests were two-sided, and the threshold statistical significance was set at p<0.05. Results: The mean age of participants was 53.4 years (46.1). The total mean MRS score was 13.9 (±7.5), mean PSS-4 score was 5.1 (±3.5), and the mean MAAS score was 4.4 (±0.9). Higher mindfulness scores correlated with lower MRS scores (correlation -0.492; one point increase in MAAS mean score correlated with a 1.98 point decrease in PSS-4 score (95% CI -2.13, -1.83), p<0.001). Higher MRS scores correlated with higher PSS-4 scores (correlation 0.552; a one point increase in MRS score correlated with a 0.26 point increase in PSS-4 score (95% CI 0.24 to 0.27, p<0.001) (Figure 1). Correlation of higher mindfulness and PSS-4 was more robust in women with higher MRS scores (MRS > 17 – 1.76; 95% CI 2.06 to -1.47 vs. MRS < 17 – 1.45; 95% CI -1.62 to -1.27). PSS-4 scores had the highest correlation with psychological domain symptoms on MRS (correlation 0.665; Slope: 0.62; (95% CI 0.58 to 0.65, p<0.001) as compared to the somato-vegetative and urogenital symptoms (correlation 0.332 and 0.227, respectively; p<0.001). Conclusion: Among midlife women ages 40-65, higher mindfulness correlated with lower menopause symptom scores as well as lower stress scores. Higher menopause symptom scores correlated with higher perceived stress. Women with higher symptom burden (MRS >17) the correlation of mindfulness with lower stress was even more robust. Further, mindfulness correlated with lower stress more strongly for the psychological domain of MRS compared to the somato-vegetative and urogenital domains. Although additional studies are needed in more diverse settings to replicate our findings, this study provides a strong signal for the potential role of mindfulness in improving psychological symptoms, emotional response to menopausal symptoms and stress in women during midlife.

Sources of Funding: None.
S-12. Hypertensive Disorders of Pregnancy and Gestational Diabetes as Risk Factors for Hot Flashes in Midlife Women

Rhonda L. Thurston1,2, Yjmin Corrós, PhD, J. MPH, FNP, Janet Catov, PhD3, Karen A. Matthews, PhD4, Sybil Crawford4, Monique Hedderson, PhD5, Rebecca C. Thurston5,6, OBI/GYN, University of Oklahoma Health Science Center, Edmond, OK; 1Epidemiology, University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA; 1OB/GYN, University of Pittsburgh, Pittsburgh, PA; 2Psychiatry, University of Pittsburgh, Pittsburgh, PA; 3Medicine, University of Massachusetts, Worcester, MA; 4Division of Research, Kaiser Permanente, Oakland, CA

Objective: Most (60-80%) women experience hot flashes (HF) during the menopausal transition. HF have been associated with vascular endothelial dysfunction beyond standard cardiovascular disease risk factors and estradiol. Hypertensive disorders in pregnancy (HPD) and gestational diabetes mellitus (GDM) are associated with vascular and endothelial dysfunction. Given a similar pathophysiology, we hypothesized that women with a history of HPD and GDM may experience a greater burden of HF. We further hypothesize that nulliparous women may have fewer HF.

Design: A longitudinal analysis was performed that included data from 2,249 women who completed a pregnancy history questionnaire at the 13th visit of the Study of Women’s Health Across the Nation (SWAN).

Women were asked if they had “any of the following pregnancy complications: preclampsia/toxemia (high blood pressure and proteinuria), gestational hypertension or pregnancy induced hypertension, gestational diabetes (no diabetes pre-pregnancy).” Accordingly, women were classified as nulliparous, no HPD/GDM, or a history of HPD/GDM. HF were assessed at baseline and at each of the 13 follow-up visits over 15 years. Women with hysterectomy/oophorectomy and study observations with hormone therapy use were excluded. HF were recorded as any vs none; 0 days, 1-3 days, 6+ days in past 4 weeks. Participant characteristics were compared across our exposure groups (nulliparous, no HPD/GDM, history of HPD/GDM) using ANOVA or Kruskal-Wallis tests for continuous data and Chi-Square or Fisher’s Exact for categorical variables. Pregnancy history was examined in relation to HF using generalized estimating equations adjusting for clustering by study site and menopausal status.

Results: At time of the pregnancy questionnaire, women were on average 61 years of age. Out of the 2,249 individuals included in the analysis, 395 (17.6%) women were included in the nulliparous group, 1,646 (73.2%) in parous women without HPD/GDM and 208 (9.2%) in parous women with HPD/GDM. Of the women in the HPD/GDM group, 176 (85%) women had a HPD only, 27 (13%) had GDM and 5 (2%) reported both. Women in the HPD/GDM group had a more adverse cardiovascular disease risk factor profile including higher BMI, anti-hypertensive, lipid-lowering medications and anti-diabetic medication use; and were HDB, levels (p<0.01). In age-adjusted models, compared to women with no HPD/GDM, nulliparous women had a lower odds of reporting any HF (OR: 0.81, 95% CI: 0.71, 0.92), and women with HPD/GDM had a greater odds of any HF (OR: 1.20; 95% CI: 1.01, 1.42). In addition, while nulliparous women had a lower odds of frequent HF (6+ days), the HPD/GDM group had a greater odds of frequent HF (OR: 1.19, 95% CI: 1.00, 1.41). In age-adjusted models, these associations were attenuated after controlling for site, race/ethnicity, financial strain, and particularly education. Conclusion: HPD/GDM may be modestly associated with a greater number of HF. Meanwhile, nulliparity may be associated with fewer HF. Associations between pregnancy history and HF were attenuated after adjusting for education, suggesting the important role of social factors in pregnancy outcomes and HF.

Sources of Funding: SWAN has grant support from the National Institutes of Health (NINDS, R01DK21916, R01DK43896, R01AG012495), the National Institute of Nursing Research (NINR) and the NIH Office of Research on Women’s Health (ORWH) (Grants U01NR004061, U01AG012535, U01AG012555, U01AG012535, U01AG012555, U01AG012554, U01AG012495). This study was also supported by the NIH, National Heart, Lung, and Blood Institute (K24HL134356 to Thurston). The content of this abstract is solely the responsibility of the NIA, NINR, ORWH and does not necessarily represent the official views of the NIA, NINR, ORWH, and NIH.

S-13. Bone turnover and Risk of Hip Fracture: A Case-Control Study in the Women’s Health Initiative

Carolyn J. Crandall, MD, MS1, Sowmya Vasani2, Andrea LaCroix3, Meryl LeBoff3, Jane Cauley3, John A. Robbins4, Douglas Bauer5, University of California, Los Angeles, Los Angeles, CA; 2Fred Hutchinson Cancer Research Center, Seattle, WA; 3University of California, San Diego, La Jolla, CA; 4Brigham and Women’s Hospital, Boston, MA; 5University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA; 6UC Davis Medical Center, Sacramento, CA; 7The Ohio State University, Columbus, OH; 8University of California San Francisco, CA

Objective: To determine the associations of serum C-terminal telopeptide of type I collagen (CTX) and serum procollagen type I amino-terminal propeptide (P1NP) with hip fracture risk among postmenopausal women aged 50-79 years at baseline.

Design: We performed a case-control study (523 cases, 400 controls) nested within the prospective Women’s Health Initiative Observational Study, which enrolled participants at 40 U.S. clinical centers. Cases were women with incident hip fracture not taking osteoporosis medication; hip fractures were confirmed using medical records. Untreated controls were matched by age, race/ethnicity, and date of blood sampling. Serum CTX and serum P1NP were analyzed on 12-hour fasting blood samples. Main outcome measures were incident hip fracture risk (mean follow-up 7.13 years).

Results: After adjustment for body mass index, smoking, frequency of falls, history of fracture, calcium and vitamin D intake, and other relevant covariates, neither serum CTX level nor serum PINP level was statistically significantly associated with hip fracture risk (CTX P1NP value 0.22, PINP P1NP value 0.53)(Table). Conclusion: Our results do not support the utility of serum CTX level or P1NP level to independently predict hip fracture risk in this age group. These data will help inform future guidelines regarding the potential utility of these markers in fracture prediction.

Sources of Funding: The WHI program is funded by the National Heart, Lung, and Blood Institute, National Institutes of Health, U.S. Department of Human and Services through contracts HHSN268201600004C, HHSN268201600005C, HHSN268201600006C, HHSN268201600007C, HHSN268201600008C, HHSN268201600009C, HHSN268201600000C, and HHSN268201600004C. Additional support for these analyses was provided by US Public Health Service Research grants: RO1 AG03105 and AR048919.

Adjusted Associations of C-Terminal Telopeptide of Type I Collagen (CTX) Levels and Procollagen Type I Aminoterminal Propeptide (P1NP) Levels with Hip Fracture Risk

S-14. Efficacy of Internet-based Cognitive Behavioral Therapy for Treatment-induced Menopausal Symptoms in Breast Cancer Survivors: Results of a Randomized Controlled Trial

Vera Atema, MSc1, Marijke van Leeuwen, PhD2, Hester S.A. Oldenburg, MD, PhD2, Marc van Beurden, MD, PhD,3 Jacobien M. Kieffer, PhD2,3 Myra S. Hunter, PhD3, Nienke D. van Assen, PhD4, Division of Psychosocial Research and Epidemiology, The Netherlands Cancer Institute, Amsterdam, Netherlands; 5Department of Surgical Oncology, The Netherlands Cancer Institute, Amsterdam, Netherlands; 6Department of Gynecology, The Netherlands Cancer Institute, Amsterdam, Netherlands; 7Department of Psychology, Institute of Psychology, Psychology and Neuroscience, Kings College London, London, United Kingdom

Objective: Treatment-induced menopause causes significant symptom burden for women who have undergone adjuvant treatment for breast cancer (BC). Hot flushes and night sweats (HF/NS) are the most common and disruptive symptom of the menopause. Previous studies have demonstrated that cognitive behavioral therapy (CBT), delivered in group format, is effective in alleviating menopausal symptoms and particularly HF/NS, in healthy women and BC survivors. In-person CBT can, however, be inconvenient for some women and negatively affect program compliance. A promising approach is to use the Internet to make this form of CBT more accessible and feasible. We evaluated the efficacy of Internet-based CBT, with or without therapist guidance, on frequency and impact of HF/NS, overall levels of menopausal symptoms, sleep quality, sexual functioning, psychological distress and health-related quality of life in BC survivors with treatment-induced menopausal symptoms. Design: We randomly assigned 254 BC survivors to a therapist guided or a self-managed Internet-based CBT group or to a control group. Inclusion criteria included, amongst others, the presence of HF at least 10 or more problematic HF/NS for week, for a period of at least 2 months. Women randomized to the intervention groups had access to a 6 week CBT program including online psychoeducation, behavioral monitoring and cognitive restructuring, supplemented by relaxation exercises and homework assignments. Women allocated to the control group were referred to a trained therapist. Self-report questionnaires were administered at baseline (T0), at 10 weeks (T1) and 24 weeks (T2) post-randomization. We used mixed-effects models to compare groups over time. Results: The mean age of the study sample was 47.4 (SD = 5.5) years. At baseline reported, on average, 50.8 (SD = 40.9) hot flushes and 18.4 (SD = 13.4) night sweats per week. The mean impact of the HF/NS was rated
a 4.9 (SD = 1.9) on a 10 point scale (higher scores indicate more impact). Nearly 86% of women in the guided CBT group and 62% of women in the self-managed CBT group completed the CBT program. Compared with the control group, the guided and self-managed CBT groups reported a significant decrease in the impact of HF/NS (effect size [ES] = .63 and .56, P < .001) and improvement in sleep quality (ES = .57 and .41; P < .001). The guided CBT group also reported a significant decrease in overall levels of menopausal symptoms (ES = .37, P = .010), hot flush frequency (ES = .34; P = .019) and night sweats frequency (ES = .64; P < .001). These effects remained significant at longer term follow-up, with smaller effect sizes. Additional long-term effects for the self-managed CBT group included reduced overall levels of menopausal symptoms and HF/NS frequency. No significant effects were observed for sexual functioning, psychological distress or health-related quality of life. Conclusion: Internet-based CBT, with or without therapist guidance, has salutary effects on the frequency and impact of HF/NS, overall levels of menopausal symptoms and sleep quality. Further analyses should inform us about the cost-effectiveness of both formats of the Internet-based CBT program. If demonstrated to be cost-effective, this program would be a welcome addition to clinical care for BC survivors with treatment-induced menopausal symptoms. Sources of Funding: This trial was funded by the Dutch Cancer Society and the Netherlands Cancer Institute.

FRIDAY CONCURRENT SESSION #1

S-15. 17β-Estradiol/Progesterone in a Single, Oral, Softgel Capsule (TX-001HR) Significantly Increased the Number of Symptom-free Days in the REPLENISh Program
Andrew M. Kaunitz, MD, Ginger Constantine, MD, Brian Bernick, MD, Sebastian Mirkin, MD, University of Florida College of Medicine-Jacksonville, Jacksonville, FL; EndoReum Consultants, LLC, Mulvern, PA; TherapeuticsMD, Boca Raton, FL.
Objective: an investigational combination of 17β-estradiol (E2) and progesterone (P4) in a single, oral, softgel capsule (TX-001HR; TherapeuticsMD, Boca Raton, FL) significantly reduced the frequency and severity of moderate-to-severe vasomotor symptoms (VMS) without increasing the incidence of endometrial hyperplasia in postmenopausal participants of the REPLENISh program.1 The objective of this analysis was to examine the responder rates and number of symptom-free days with TX-001HR vs placebo. Design: REPLENISh (NCT01942668) was a phase 3, randomized, double-blind, placebo-controlled, multicenter trial that evaluated TX-001HR in postmenopausal women (40-65 years) who had an intact uterus and VMS. A VMS substudy examined 4 co-primary efficacy endpoints of change in frequency and severity of moderate-to-severe hot flushes at weeks 4 and 12 with TX-001HR doses vs placebo. Women with moderate-to-severe hot flushes (≥ daily or ≥ a week) were randomized 1:1:1 to daily E2/P4 of 1 mg/100 mg, 0.5 mg/50 mg or 0.25 mg/50 mg, or placebo. Responders groups were women who had at least 50% or 75% reductions in their moderate-to-severe VMS. The weekly number of symptom-free days (days without moderate-to-severe hot flushes) with TX-001HR vs placebo was determined using a mixed effects model for repeated measures. Results: There were 726 women eligible for the VMS efficacy analysis (E2/P4 of 1 mg/100 mg [n=141], 0.5 mg/100 mg [n=149], and 0.25 mg/50 mg [n=154]; or placebo [n=135]). Significantly more (P=0.05) women who took TX-001HR vs placebo were ≥50% responders and ≥75% responders at week 12 (Figure). The proportion of women without severe hot flushes (i.e., sensation of heat with sweating that causes cessation of activity) at week 12 was 48.6%, 62.7%, and 54.0%, and had 1 mg/100 mg, 0.5 mg/50 mg, and 0.25 mg/50 mg, respectively, compared with 26.1% for placebo (150.01). Conclusion: In the REPLENISh trial, the combined formulation of E2/P4 in a single, oral, softgel capsule significantly increased the number of symptom-free days vs placebo. Women taking TX-001HR had 50% and 75% reductions in their moderate-to-severe VMS. By demonstrating reductions in the frequency and severity of moderate-to-severe VMS with TX-001HR relative to placebo, this analysis extends the trial’s primary efficacy results. In addition, no cases of endometrial hyperplasia noted among participants.2 If approved, TX-001HR may provide a new treatment option for those women with moderate-to-severe VMS who need endometrial protection, including those who prefer taking bioidentical hormone therapy.3 Lobo RA et al, Menopause 2017;24:1430-1431

S-16. Estrol, the Next Generation of Hormone Therapy: Results of a Phase 2b Dose-finding Study in Postmenopausal Women (E4 Relief)
Hélena P. Giraldo, Doctorate, Cristina L. Benetti-Pinto, Ticiana Mira, Daniela A. Yela, phd, Paulo c. Giraldo. Obstetrics and Gynecology, University of Campinas, Campinas, Brazil.
Objective: to evaluate the treatment with Interpersonal Current, compared with the use of estradiol cream, in sexual function of women with POI, in use of HT. Design: a randomized clinical trial was carried out with 40 women diagnosed with POI, between the ages of 18 and 50, sexually active and in use of oral hormone therapy (HT). These women filled out a validated questionnaire on sexual function (FSFI) and an informed consent form, as well as data on age, time of diagnosis, length of HT use, and frequency of sexual intercourse. They were randomly assigned to treatment either in a group of electrical stimulation of the pelvic floor with Interpersonal Current (IC group) (Endophasys NMS-0501 Device - KLD Biosystems Electronic Equipment Ltd.) in a total of 8 individual sessions of 20 minutes each throughout 4 weeks (electrodes were placed over the vulvar lips on both sides). The control group was treated with vaginal estradiol cream applied daily for 4 weeks, 0.2 mg/day (E group). The FSFI total score and domains (desire, excitement, lubrication, orgasm, satisfaction, pain) were evaluated in the beginning and after each treatment. The results were compared within and between both treatments. Results: Mean age, time of diagnosis and length of HT use were 45.5±8.1 years, 20.5±7.8 months, 4 years, 37.8±5.8 years and 37.8±4.5 years, without differences between them. The total initial and final FSFI were not different between groups, revealing improvement in both. For each group, when comparing the FSFI before and after the interventions, the 0.05 are as follows: difference for the E group was 2.78±5.04 (p=0.001) and for the

S-17. Interferential current: a new option to treat sexual complain in Premature ovarian insufficiency women in use of hormone therapy. A Randomized clinical trial
Hélena P. Giraldo, Doctorate, Cristiana L. Benetti-Pinto, Ticiana Mira, Daniela A. Yela, phd, Paulo c. Giraldo. Obstetrics and Gynecology, University of Campinas, Campinas, Brazil.
Objective: to evaluate the treatment with Interpersonal Current, compared with the use of estradiol cream, in sexual function of women with POI, in use of HT. Design: a randomized clinical trial was carried out with 40 women diagnosed with POI, between the ages of 18 and 50, sexually active and in use of oral hormone therapy (HT). These women filled out a validated questionnaire on sexual function (FSFI) and an informed consent form, as well as data on age, time of diagnosis, length of HT use, and frequency of sexual intercourse. They were randomly assigned to treatment either in a group of electrical stimulation of the pelvic floor with Interpersonal Current (IC group) (Endophasys NMS-0501 Device - KLD Biosystems Electronic Equipment Ltd.) in a total of 8 individual sessions of 20 minutes each throughout 4 weeks (electrodes were placed over the vulvar lips on both sides). The control group was treated with vaginal estradiol cream applied daily for 4 weeks, 0.2 mg/day (E group). The FSFI total score and domains (desire, excitement, lubrication, orgasm, satisfaction, pain) were evaluated in the beginning and after each treatment. The results were compared within and between both treatments. Results: Mean age, time of diagnosis and length of HT use were 45.5±8.1 years, 20.5±7.8 months, 4 years, 37.8±5.8 years and 37.8±4.5 years, without differences between them. The total initial and final FSFI were not different between groups, revealing improvement in both. For each group, when comparing the FSFI before and after the interventions, the 0.05 are as follows: difference for the E group was 2.78±5.04 (p=0.001) and for the
IC group was 4.37±5.96 (p=0.004). However, the differences between final and initial FSFI score was -2.78 ± 3.04 and 4.37 ± 5.96, p=0.291, with a greater improvement in the IC group. The differences between the domains showed an improvement of lubrication and pain in both groups, but the improvement in orgasm and satisfaction domains occurred only in the IC group. The lubrication difference was 1.16±1.22 (p=0.001) for the E group and 0.75±1.31 (p=0.014) in the IC group. The difference in pain domain in group E (0.08±1.30) and in group IC 1.00±1.47 (p=0.005). And for IC group exclusively, where there was improvement, the difference of the orgasm score was 0.90±1.42 (p=0.10); and satisfaction score difference was 0.70±1.28 (p=0.021). Sexual frequency was 2.45±0.94 initially, 2.30±0.38 final and difference ±0.15±1.23 for E group. The difference in the IC group leading to a statistical difference with improvement in the IC group (p=0.041). Conclusion: In women with POI using HT, both treatments have proven to be effective in improving global FSFI scores as well as lubrication and pain domains specifically. However, the treatment with interferential current appears to be superior to the use of estriol vaginal cream, due to also improving the orgasm and satisfaction domains specifically while improving sexual activity. Revealing a new alternative for the treatment of such sexual complaints.

**Sources of Funding:** grant#2015/8334-0, São Paulo Research Foundation (FAPESP)

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**S-18.**

Critical appraisal of vasomotor symptom assessment tools used in clinical trials evaluating estrogen therapy compared to placebo

Marie K. Christakis, MD, MPH1,2,1, Wen Shen, MD, MPH1, Donna Strobino, PhD3.

1Obstetrics & Gynecology, University of Toronto, Toronto, ON, Canada; 2Bloomberg Marie K. Christakis, MD, MPH 2,1, Wen Shen, MD, MPH 3, Donna Strobino, PhD 2.

**Objective:** To systematically critically appraise the efficacy of the estrogen therapy in perimenopausal women and the strongest indication for treatment. The presence of VMS also affects work performance during an otherwise productive time in a woman’s career. The North American Menopause Society endorses the use of oral estrogen for the treatment of VMS based on evidence from a recent Cochrane meta-analysis of 24 randomized clinical trials. The difference between the domains showed an improvement of lubrication and pain in both groups, but the improvement in orgasm and satisfaction domains occurred only in the IC group. The lubrication difference was 1.16±1.22 (p=0.001) for the E group and 0.75±1.31 (p=0.014) in the IC group. The difference in pain domain in group E (0.08±1.30) and in group IC 1.00±1.47 (p=0.005). And for IC group exclusively, where there was improvement, the difference of the orgasm score was 0.90±1.42 (p=0.10); and satisfaction score difference was 0.70±1.28 (p=0.021). Sexual frequency was 2.45±0.94 initially, 2.30±0.38 final and difference ±0.15±1.23 for E group. The difference in the IC group leading to a statistical difference with improvement in the IC group (p=0.041). Conclusion: In women with POI using HT, both treatments have proven to be effective in improving global FSFI scores as well as lubrication and pain domains specifically. However, the treatment with interferential current appears to be superior to the use of estriol vaginal cream, due to also improving the orgasm and satisfaction domains specifically while improving sexual activity. Revealing a new alternative for the treatment of such sexual complaints.

**Sources of Funding:** grant#2015/8334-0, São Paulo Research Foundation (FAPESP)

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**S-19.**

Sleep and Light Therapy for Peri-menopausal Depression

Carolyn Gibson1,2, Yixia Li3, Sabra Inslicht1,2, Karen Seal1,2, Amy Byers1,2. 1San Francisco School of Public Health, Johns Hopkins University, Baltimore, MD; 2Obstetrics & Gynecology, Johns Hopkins University, Baltimore, MD

**Objective:** Vasomotor symptoms (VMS) have consistently been reported to be the leading predictor of Health-Related Quality of Life (HRQOL) among perimenopausal women, and the strongest indication for treatment. The presence of VMS also affects work performance during an otherwise productive time in a woman’s career. The North American Menopause Society endorses the use of oral estrogen for the treatment of VMS based on evidence from a recent Cochrane meta-analysis of 24 randomized clinical trials. The difference between the domains showed an improvement of lubrication and pain in both groups, but the improvement in orgasm and satisfaction domains occurred only in the IC group. The lubrication difference was 1.16±1.22 (p=0.001) for the E group and 0.75±1.31 (p=0.014) in the IC group. The difference in pain domain in group E (0.08±1.30) and in group IC 1.00±1.47 (p=0.005). And for IC group exclusively, where there was improvement, the difference of the orgasm score was 0.90±1.42 (p=0.10); and satisfaction score difference was 0.70±1.28 (p=0.021). Sexual frequency was 2.45±0.94 initially, 2.30±0.38 final and difference ±0.15±1.23 for E group. The difference in the IC group leading to a statistical difference with improvement in the IC group (p=0.041). Conclusion: In women with POI using HT, both treatments have proven to be effective in improving global FSFI scores as well as lubrication and pain domains specifically. However, the treatment with interferential current appears to be superior to the use of estriol vaginal cream, due to also improving the orgasm and satisfaction domains specifically while improving sexual activity. Revealing a new alternative for the treatment of such sexual complaints.

**Sources of Funding:** grant#2015/8334-0, São Paulo Research Foundation (FAPESP)

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**S-20.**

Increased Risk for Cardiovascular Disease Among Postmenopausal Women with Diabetes and Comorbid Posttraumatic Stress Disorder

Carolyn Gibson1,2, Yixia Li1, Sabra Inslicht1,2, Karen Seal1,2, Amy Byers1,2. 1San Francisco VA Health Care System, San Francisco, CA; 2University of California, San Francisco, CA

**Objective:** Posttraumatic stress disorder (PTSD) is a common but under-recognized condition affecting the health and well-being of an estimated one in ten women. A growing body of evidence suggests that PTSD may contribute to risk for diabetes and cardiovascular disease (CVD), primary health concerns among postmenopausal women. However, these relationships have largely been evaluated among male Veterans and relatively healthy civilian women. Further, it is not known if PTSD may augment CVD risk among women with diabetes, a relationship that has been demonstrated in women with comorbid depression and diabetes and has implications for comprehensive clinical management. In this study, we examined independent and additive associations between PTSD and diabetes with time to incident CVD in a large sample of postmenopausal women Veterans, a population at high risk for these concerns. **Design:** We examined national Department of Veterans Affairs medical record data from women Veterans aged 55 and older. We used ICD-9 codes to categorize women with posttraumatic stress disorder (PTSD), diabetes, and cardiovascular disease (CVD: myocardial infarction, congestive heart failure, and/or cerebrovascular disease). Fine-Gray proportional hazards models were used to examine associations between PTSD, diabetes, and CVD at baseline (2008-2011) with incident CVD over a four-year follow-up period (2012-2015), accounting for the competing risk of death. Data from women with CVD at baseline were excluded. All models were adjusted for age, education, and income as documented in the medical record; and hypertension, chronic medical conditions, and obesity, as indicated by ICD-9 codes. Results: In this sample of 150,791 postmenopausal women Veterans (mean age 62.64 ± 8.03 years), 9% had PTSD, 17% had diabetes, and 2% had comorbid PTSD and diabetes at baseline. The four-year cumulative incidence of CVD outcomes was 12% for diabetes, 12% for PTSD, and 2% for comorbid PTSD and diabetes. Risk of incident CVD was approximately 50% higher for women with PTSD or diabetes.
alone at baseline (PTSD HR 1.47, 95% CI 1.38-1.57, p<.001; diabetes HR 1.49, 1.44-1.53, p<.001), and 2-fold higher for women with comorbid PTSD and diabetes at baseline (HR 1.96, 95% CI 1.90-2.12, p<.001). 

**Conclusion:** Among postmenopausal women, both PTSD and diabetes independently increased CVD risk over a four-year period, and significantly compounded risk when they co-occurred beyond the effects of either condition alone. The pronounced effect of these exposures over a relatively brief period raises questions about the association and potential intervention, in this vulnerable and understudied population. These findings add to the limited literature examining the health-related impact of PTSD among postmenopausal women, and highlight the importance of this under-recognized condition in the health of women across the lifespan.

**Sources of Funding:** This work was supported by the U.S. Department of Defense grant W81XWH-11-2-0189 (ALB), which was administered by the Northern California Institute for Research and Education and with resources of the San Francisco Veterans Affairs Medical Center, and the Department of Veterans Affairs grant CX001119 (ALB). Work was also supported in part by the Advanced Fellowship in Women’s Health program in the San Francisco VA Health Care System (CJR).

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**S-21.** MeToo and Women’s Health: Sexual Harassment, Sexual Assault, and Midlife Women’s Health

Rebecca C. Thurtton1, Yuefang Chang, PhD1, Roland von Känel, MD2, Karen A. Matthews, PhD1. 1University of Pittsburgh, Pittsburgh, PA; 2University Hospital Zurich, Zurich, Switzerland

**Objective:** Sexual harassment and assault are prevalent experiences in women. These experiences are understood to be important to women’s lives and functioning, yet their implications for women’s health remain less well understood. We first examined the prevalence of sexual harassment and assault in a sample of non-smoking midlife women. We next tested whether women with a history of harassment and/or assault had poorer mental and physical health at midlife. **Design:** 304 (72% White, 28% non-White) nonsmoking women ages 40-60 were recruited. All women were free of clinical cardiovascular disease (CVD), had their uterus and at least one ovary, and were not using select medications (hormone therapy, insulin, beta blockers, calcium channel blockers, selective serotonin reuptake inhibitors, serotonin-norepinephrine reuptake inhibitors). All women underwent an interview, physical and anthropometric measures [height, weight, systolic (SBP) and diastolic blood pressure (DBP)], a fasting blood draw [glucose, insulin, lipids, high sensitivity C-reactive protein (hsCRP)], three days of sleep actigraphy monitoring, 24-hours of electrocardiogram (for heart rate variability) and completed validated questionnaires (Center for Epidemiologic Studies for Depression Scale, Spielberger State Trait Anxiety Inventory, Pittsburgh Sleep Quality Index, Brief Trauma Questionnaire including questions about lifetime history of sexual harassment and assault). Associations between sexual harassment and assault and health indices were separately tested in linear regression models adjusting for covariates associated with the outcome at p<.10 [e.g., age, race/ethnicity, education, body mass index (BMI), snoring, shift work, co-morbidities, and medications: anti-hypertensive, lipid-lowering, anti-inflammatory, anti-coagulant, psychotropic, sleep medications]. Interactions with race/ethnicity were tested in all models. **Results:** 19% of women reported workplace sexual harassment, 22% of women reported a history of sexual assault, and 10% of women experienced both exposures. Women with a history of sexual harassment were more likely to be college educated (71% vs 55%, p<.03), and yet have greater financial strain (46% vs. 28%, p<.0006) than their non-harassed counterparts. Neither harassment nor assault varied by race/ethnicity. Controlling for covariates (e.g., age, race/ethnicity, education, BMI, smoking status, medication use), sexual harassment was associated with higher blood pressure [SBP: b(SE)=3.96(1.94), p=.04; DBP: b(SE)=2.40(1.29), p=.06], greater triglycerides [b(SE)=15.06, p=.01], poorer sleep quality [b(SE)=15.07, p=.03], and for non-White women (interactions harassment*race p<.05), poorer objective sleep measures [naps: b(SE)=22.15, p=.05]. Soy foods have garnered more attention since the Women's Health Initiative (WHI) [32-33], with some evidence suggesting potential effects on cardiovascular, anti-inflammatory, and anti-oxidant effects. Yet, the potential for promoting health, but also raised much concern because of conflicting reports of soy effects on BC prognosis. This study aimed to investigate the association of pre-diagnosis dietary soy intake and all-cause mortality among BC survivors in Hong Kong Chinese women. **Design:** A cohort study comprising 1,497 BC survivors was recruited from 2010 to 2012 from two regional hospitals offering breast cancer treatment. The two hospitals offered breast cancer treatment to one-third of BC cases in Hong Kong. All participants were diagnosed with primary BC within 12 months of study entry, and had no prior history of breast or other cancers. Face-to-face interviews based on structured questionnaire were conducted at entry to collect information on socio-demographic, medical, reproductive, and lifestyle factors. Clinical information was obtained from medical records. Anthropometric measurements were also obtained based on the standardized protocol. Soy food intake was assessed based on previously validated soy food frequency questionnaire1, and soy isoflavone intake estimated based on local soy food content2. Data collection was repeated at every 6-month follow-up. Information on all-cause mortality up until November 2017 was obtained from active follow-up and computerized clinical management system, with 100% completion rate. **Results:** The mean age of the cohort at entry was 51.8±10.97 years and 47.8% were postmenopausal. 83.5% of the BC were of the invasive ductal carcinoma subtype. 9.8% of deaths (5.9% among postmenopausal) occurred during the follow-up period (mean 50.89±16.86 months). The mean pre-diagnosis soy isoflavone intake was 9.73 (±3.87).mg/day. After adjustment for the potential confounders (age, education, body mass index, type of therapies, ER/PR status, cancer stage, menopausal status, and dietary energy intake), all-cause mortality was observed to be lower among women with higher energy adjusted soy isoflavone intake (Hazard ratio 0.64, 95% CI 0.37-1.19), while...
those of the third quartile had 5% lower mortality risk but statistically not significant. Stratified analysis showed the adjusted mortality hazard ratio to be 0.45 (95% C.I. 0.2-0.9) for premenopausal (95% C.I. 0.5-0.9) for postmenopausal survivors belonging to the middle intake tertile. This study is still ongoing and further analyses would reveal the effect of post-diagnosis soy isoﬂavone intake on BC survival.


Sources of Funding: This study has been supported by the World Cancer Research Fund International Grant: No.2010/249 and 2014/1197.

S-24. The Johns Hopkins Menopause Curriculum App, a pilot study

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Objective: The postmenopausal population will increase dramatically over the next decades. Women are expected to live past their eighties and spend approximately one third of their lives in menopause. Physicians who are knowledgeable in menopause medicine are greatly needed. Our educational objective is to provide a real time step-by-step guide for the evaluation, diagnosis, management and treatment of menopausal women. This menopause curriculum will be easily accessible on a smartphone via an app and consulted for information as the patient is being interviewed. Furthermore, within healthcare education a need exists for a menopause curriculum. However, practical application of knowledge to the clinical arena has been more challenging. GYN/OB resident clinics are filled with young women of reproductive age. Internal Medicine resident clinics have patients with multiple comorbidities and high acuity. Trainees often don’t see enough menopausal patients to achieve and maintain comfort and competence. In this setting, a smartphone app can be an invaluable educational modality. We hypothesize; this innovative system will significantly improve patient satisfaction, in addition to improving providers’ effectiveness. Our primary objective, in this pilot study, was to launch an app with OB/GYN residents at a large academic institution to assess the efficacy of the app as an effective teaching tool as well as the perceived user-friendly quality of the app. Design: A mobile device app was created with 24 modules focusing on core competencies regarding care of menopausal women both for management of acute symptoms and preventative health. The first pilot session was performed on 15 OB/GYN residents during their protected educational time in May 2018. The residents were given a 24 question, multiple-choice test targeting core competencies of menopause clinical knowledge and instructed to use the Menopause App to answer the questions. Afterwards, the answers were reviewed and discussed in detail. The residents were then asked to perform a survey with psychometrics of the app to evaluate the user-friendly quality of the app. Results: Of the residents present, 50% were interns, 25% were second years and 25% were fourth years. The average test score was 78.3% correct. In terms of the psychometric assessment of the app via post-test survey, 60% indicated that the app was “moderately effective at providing clear content” and “moderately effective at providing engaging content”. Conversely, 90% indicated that the app was “very effective or extremely at providing relevant content” and 80% indicated that they were “very to extremely likely to recommend the use of the app to a colleague”. On the free text aspect of the survey, the most common constructive criticism was improving the search function and simplifying the organization of the content. Overall, the residents reported that the strongest aspect of the app was its content, reporting “it’s a needed tool and it’s packed full of information”.

Conclusion: Our goal is to improve health care for menopausal women by expediting the healthcare provider’s learning process and thereby improving patients’ experiences. A mobile app can effectively provide healthcare professionals instantaneous access to fundamentals and recommendations in real time, “at the bedside”. Menopausal women are cared for by a host of different providers both in terms of profession and specialty. We will continue to improve this app by piloting it with other departments, including OB/GYN, internal medicine, and psychiatry. A mobile device app can effectively provide healthcare professionals instantaneous access to core clinical knowledge and instructed to use the Menopause App to answer the questions. Overall, the residents reported that the strongest aspect of the app was its content, reporting “it’s a needed tool and it’s packed full of information”.

Sources of Funding: Pfizer Grant

FEATURED POSTER PRESENTATIONS

P-1. NT-814, a novel dual NK<sub>1</sub>, receptor antagonist results in immediate improvements in bothersome post-menopausal symptoms.

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Objective: To assess the preliminary efficacy and speed of onset of effect of NT-814, a novel dual non-hormonal, neurokinin (NK<sub>1</sub>), antagonist, in women with bothersome post-menopausal symptoms

Design: This was a randomised, double-blind, placebo-controlled study. Generally healthy female subjects aged 40-65 years experiencing 7 to 20 hot flushes per day received NT-814 or placebo once daily in sequential, escalating dose cohorts. Clinical pharmacokinetics were also evaluated.

Results: 76 subjects received placebo (N=18), 50 mg, 100 mg 150 mg (N=15 per dose) or 300 mg NT-814 (N=13). Demographics and baseline characteristics were generally well matched at baseline. In the second week of treatment the higher doses of NT-814 resulted in profound reductions from baseline in the frequency of both moderate/severe daytime HF (up to 84%) and NTA (up to 81%) that were highly significant compared to placebo (37% and 32%). Additional analyses were undertaken to evaluate the speed of onset. For the 150 mg dose the improvements were significantly better than placebo on the first day of treatment for both endpoints (HF 2.65 fewer flushes, p<0.05; NTA 2.7 fewer awakenings, p<0.05) and remained significant throughout the 14-day treatment period. The maximum separation from placebo was achieved by day 7. (HF 5.87 fewer flushes, p<0.0001; NTA 2.7 fewer awakenings, p<0.001). The improvements for HF were also significant from day 3 onwards and for NTA were significant on a number of days from Day 3 onwards. Although there appeared to be numerical differences between the 150 and 300 mg doses, exposure response modelling showed no difference between them.

Conclusion: NT-814 was well tolerated with no safety concerns. For the 300 mg dose, the improvements for HF were also significant from day 3 onwards and for NTA were significant on a number of days from Day 3 onwards. There were also rapid and marked improvements in the number of night time awakenings. Improvements in HF and sleep have been reported as early as 3-5 days for other NK<sub>1</sub> antagonists; this is the first report of improvements in HF frequency and night-time awakening on the first day of treatment and raises the prospect of NT-814 rapidly treating a range of bothersome post-menopausal symptoms. NT-814 will be progressed into a Phase 2b dose finding study shortly.

Sources of Funding: NeRRe Therapeutics Ltd sponsored the study

P-2. Vaginal microbiota, local immunity and symptoms in postmenopausal women

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Objective: To investigate the vaginal microbiota in postmenopausal women and to explore the association between the severity of vaginal symptoms, microbiota, local immunity and vulvovaginal atrophy.

Design: The study included 136 women with a postmenopausal period from 1 year to 20 years. Diagnosis of VA was based on cytological method of investigation (the calculation of the index of maturation of the vaginal epithelium (IMVE - the norm is ≥ 65%)). The PCR-RV method was used to quantify the vaginal microbiota, taking into account the total bacterial mass (TBM), the number and fraction of lactobacilli. There are no normal criteria to describe the normal vaginal microbiocenosis in postmenopausal women, so we proposed the classification of "normal vaginal microbiocenosis in postmenopausal women". Vaginal symptoms was mostly related to vaginal microbiota composition than the presence of anaerobic flora of the vagina, and in women without VA– by lactobacilli. The severity of vaginal symptoms was mostly related to vaginal microbiota composition than the presence of anaerobic flora of the vagina, and in women without VA– by lactobacilli. The severity of vaginal symptoms was mostly related to vaginal microbiota composition than the presence of anaerobic flora of the vagina, and in women without VA– by lactobacilli.

Conclusion: Since the level of expression of the studied genes, which included women without VA and normocenosis. In the other groups depending on VA presence/absence as well as on the state of microflora (normocenosis or dysbiosis), a comparison group was selected for the evaluation of mRNA expression in dependence on VA presence/absence as well as on the state of microflora (normocenosis or dysbiosis).
expression levels of mRNA were normalized by the median of the expression level of that gene in the group of comparison. In patients with VA the mRNA expression genes was significantly lower of IL12 and TNF by 2 times, IL18 by 7.7 times, TGFB by 3.75 times, CD68 by 3.5 times, GATA 3 by 9 times, and ILIB 2 by 9 times in relation to the group of comparison. **Conclusion:** The severity of vaginal symptoms is mostly related to vaginal microbiota composition than the presence or absence of VVA in postmenopausal women. Our results suggest that with VVA the levels of mRNA of cytokine genes expression (IL 1B, IL 12, IL 18, TNF, TGFβ, CD 68, GATA3) is significantly decreased. It may be the result of a decrease in the functional activity of vaginal epithelium and decline of lactobacilli cell.

**Sources of Funding:** none

**P-3.**

**Estrogen deficiency and diabetes may impair bone formation and collagen turnover in periodontal tissue of female rats.**

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**Objective:** Increasing evidence indicates that both diabetes and estrogen deficiency at menopause increase the susceptibility to periodontitis. This opens the question whether post-menopausal women with diabetes are more likely to develop periodontal diseases.

**Design:** Thirty adult female Wistar rats were ovariectomized (OVX) or SHAM-operated (SHAM). Three weeks after surgery, diabetes was induced by an intraperitoneal injection of streptozotocin (65 mg/kg i.p.) in some SHAM and OVX rats, and confirmed by serum glucose levels analysis. The animals were then assigned into the following groups: (I) Sham; (II) OVX; (III) OVX+E (treated with 10μg/Kg/day of 17β-estradiol); (IV) diabetic Sham; (V) diabetic OVX; (VI) diabetic OVX+E. The animals were subcutaneously treated with the vehicle for 60 consecutive days, 1 time a day. After treatments, the animals were euthanized and fragments of maxillae containing periodontal tissue of the first molars were removed and fixed in 4% paraformaldehyde. After decalcification the samples were embedded in paraffin. Sagittal sections were subjected to the Picrosirius red method for collagen evaluation in polarized light microscopy, or to immunohistochemistry for the detection of Runx-2 (a marker of osteoblast formation).

**Results:** Body weight was significantly lower in diabetic rats compared to non-diabetic ones. A lower birefringence intensity of collagen fibers, as well as a lower immunoreactivity of Runx-2 were observed in the periodontal ligament of all diabetic and OVX rats, compared to non-diabetic SHAM animals. These effects were more evident in rats with both condition (OVX + diabetes). Nonetheless, estradiol treatment alleviated these effects. The observed decrease in birefringence of collagen fibers indicates a lower content of these structures in the periodontal ligament of OVX and diabetic rats. In addition, the reduced Runx-2 immunostaining suggest an impairment of alveolar bone formation in OVX and diabetic rats. **Conclusion:** Our results suggest that estrogen deficiency and diabetes promote deleterious effects in periodontal tissue of female rats.

**Sources of Funding:** NONE

**BONE HEALTH POSTER PRESENTATIONS**

**P-4.**

**Effects of soybean isoflavones and 17β estradiol on bone tissue of type 1 diabetic rats.**

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**Objective:** The aim of this study was to evaluate the effects of soybean isoflavones or 17β estradiol on bone tissue of ovariectomized rats with type 1 diabetes. **Design:** Sixty adult, virgin, female rats underwent ovariectomy were randomized into six groups of ten rats (n=10). The Sham control group consisted of six animals; GI sham-17β-estradiol (1mg/Kg/ day, intradermic); GII sham- isoflavonised; GIII st- diabetic ovariectomized animals; GIV- diabetic ovariectomized animals; GV- diabetic control ovariectomized animals that received propylene glycol vehicle; GVI- diabetic control ovariectomized animals receiving propylene glycol vehicle; GV- diabetic ovariectomized animals treated with soy isoflavones (150mg/kg body weight/day); GVI- diabetic control ovariectomized rats treated with estradiol (10mg/kg body weight/day).

After treatment, the rats were euthanized and their distal femurs were removed for histological routine, histochemistry and biochemical study. Histological sections were stained with haematoxylin–eosin or subjected to picrosirius red or Masson’s Trichrome. In distal femurs, the trabecular bone volume was higher in the groups treated with estradiol (GVI), when compared to isoflavone, while the cortical bone width and the presence of mature type 1 collagen fibers were higher in (GV).

At the trabecular bone region, the percentage of total glycosaminoglycans (GAGs) was higher in GV and the percentage of only sulfated GAGs was higher in (GVI), while the heparin-like 2 chondroitin sulfate in shafts of femurs was seen in (GVI).

**Conclusion:** Our data indicate that soybean isoflavones improve bone quality in femurs of type 1 diabetics rats by increasing histomorphometric parameters, the content of GAGs and mature type 1 collagen fibers.

**Sources of Funding:** CEFAPES.

**P-5.**

**Efficacy and safety of bazedoxifene (Viviant) in postmenopausal women with osteoporosis and osteopenia**

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**Objective:** To evaluate the efficacy and safety of bazedoxifene in women with postmenopausal osteoporosis and osteopenia. **Design:** A prospective pilot study was performed in Asan Medical Center from May 2014 to January 2018 and the eligible patients were followed up for up to 15 months. Patients were screened and women with osteoporosis or osteopenia were included. Subjects received bazedoxifene 20 mg per day, followed by visits at months 1, 3, 9, and 15. Bone mineral density (BMD) of lumbar spine and hip was measured using DXA (Dual X-ray absorptiometry) at months -24 and -12, at the start of the study, and at month 12. Safety and tolerability evaluations included adverse event reports, physical examinations and clinical laboratory tests, including chemical and lipid assessments. Other safety monitoring included breast examination, mammography, and gynecoendocrinology ultrasound. **Results:** Ninety-nine patients were enrolled, and 97 patients completed the study in 15 months. Eleven patients (11.3%) showed significant improvement in lumbar spine BMD at month 12 (p < 0.05), including 7 (7.3%) with an increase in lumbar spine BMD and 9 patients (9.3%) showing a decrease in lumbar spine BMD prior to administration of bazedoxifene obtained sustained BMD after medication. Sixteen of the 97 patients (16.4%) complained of dyspepsia, fourteen patients (14.4%) showed an increase in liver enzymes, and 8 patients (8.2%) had shoulder pain, but these events did not lead to discontinuation of medication. There were no serious adverse events including venous thromboembolism, coronary heart disease, cerebrovascular accidents, breast cancer, or endometrial carcinoma. **Conclusion:** Bazedoxifene prevented bone loss and reduced bone turnover and was generally safe and well tolerated in postmenopausal women with osteoporosis and osteopenia.

**Sources of Funding:** None

**P-6.**

**Evidence of autophagy participation in osteoclast activity following estrogen withdrawal in alveolar bone of ovariectomized rats.**

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**Objective:** It has been reported that estrogen influences bone health by regulating autophagy, a cell survival program that is important in osteoclast activity, as autophagy is one of the most important roles in osteoclast activity, we hypothesized that estrogen status influence osteoclast autophagy. Here, we evaluated the effects of estrogen status on the expression of autophagy markers in alveolar bone osteoclasts of ovariectomized rats. **Design:** Thirty adult female Wistar rats were ovariectomized (OVX) or SHAM-operated (SHAM). After three weeks, six OVX and six SHAM rats were sacrificed whereas the remaining rats received daily subcutaneous injections of estrogen (30 mg/kg bw, OVXE group), or vehicle solution (SHAM and OVX groups) for 15 days (n=6 rats/group). Serum estradiol levels were measured by electrochemiluminescence immunoassay and the fragments of maxilla containing the alveolar bone of the first molars were removed and fixed in 4% formaldehyde buffered at pH 7.2 with 0.1 M sodium phosphate. After decalcification in 7% EDTA, the fragments were embedded in paraffin. Sections were subjected to the TRAP method (osteoclast marker) or to the immunohistochonnectional detection of becin-1 and MAP-LC3a (autophagy markers). The number of TRAP-positive osteoclasts and the number of immunolabelled multineucleated giant cells (MNCs) was computed along the alveolar bone surface of the first molar, at x100 magnification. Statistical analysis was performed by ANOVA/Tukey post-hoc test. **Results:** The serum estradiol levels decreased significantly (p=0.01) in the OVX-group compared with SHAM and OVXE groups. Three weeks after surgical procedures, a significant increase (p<0.05) in the number of TRAP-positive osteoclasts as well as in the number of MNCs was observed. The ovx group showed a decrease in the bone surface of rats from OVX group in comparison with SHAM group. In addition, estrogen treatment reduced significantly (p=0.05) the number of TRAP-positive osteoclasts and the number of immunolabelled MNCs for autophagy markers. As MNCs were the only cell type express osteocalcin along the alveolar bone surface are presumably osteoclasts, these results support a possible association between autophagy and increased osteoclast activity following estrogen depletion. **Conclusion:** The estrogen depletion increases the immunorexpression of autophagy markers in alveolar bone osteoclasts, whereas estrogen replacement reduces these effects. Future studies are needed to determine whether the modulation of autophagy in osteoclasts is efficient against post-menopausal bone loss.

**Sources of Funding:** CAPES
P-7.
Association between Bone Mineral Density and Dietary Calcium Intake in Postmenopausal Women: a Korean Population–based Study

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Objective: Calcium is an essential nutrient for bone health and calcium intake has been encouraged for elderly population to prevent osteoporosis. However, mean dietary calcium intake in Asian population was reported to be low due to lower intake of dairy food compared to that of Western countries and few studies reported the effect of dietary calcium intake on bone in Asian population. The aim of the present study is to investigate the association between bone mineral density (BMD) and dietary calcium intake from the Korean population, in which low calcium intake is highly prevalent. Design: This study was performed using the data from the Korea National Health and Nutrition Examination Survey (KNHANES), conducted by the Korean Ministry of Health and Welfare. This cross-sectional nationwide representative survey has been conducted to evaluate health and nutritional status of Korean population, using a probability proportional to size sampling with stratification and multi-stage samples. In KNHANES, BMD was assessed during 2008–2011 and categorized into 3 groups according to the criteria of World Health Organization and the food frequency questionnaire (FFQ) was used to evaluate dietary intakes. Postmenopausal women without a history of hormone therapy or osteoporosis medication were included and women with uncertain menopausal status were excluded from analysis. Finally, a total of 3,287 postmenopausal women were included to determine the association between BMD and dietary calcium intake. Results: The mean dietary intake of calcium was 402 mg/day in study population. In addition, lower dietary calcium intake was more frequently observed in older postmenopausal women and a daily intake of 400–600 mg/day was observed in 70% of women (59% in 50–59 years, 62.7% in 60–69 years, 70.0% in 70–79 years and 80.4% in ≥ 80 years (P < 0.001). Complex sample analysis showed that participants with low calcium intake demonstrated greater probability of having higher systolic blood pressure, higher level of triglyceride and parathyroid hormone, and lower level of high-density lipoprotein and 25-hydroxyvitamin D (All P < 0.05). After adjustment for confounders including age, years since menopause, body mass index and physical activity, BMD at lumbar spine and proximal femur showed a positive interaction with dietary calcium intake (P < 0.05). In conclusion, lower calcium intake was observed in older postmenopausal population and dietary calcium intake was significantly associated with BMD in Korean postmenopausal women, especially in osteoporotic women. Sources of Funding: The present study was supported by grant no 04-2016-0330 from the SNUH Research Fund.

P-8.
Bone Mineral Density and Metabolic Syndrome in Postmenopausal Women: a Korean Population–based Study

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Objective: It has been suggested that bone mineral density (BMD) and cardiovascular disease have overlapping risk factors and share pathophysiological mechanisms. The present study was conducted to investigate the association between BMD and metabolic syndrome (MetS), a cluster of major risk factors for cardiovascular diseases from the Korean population-based study. Design: This study was based on the data from the Korea National Health and Nutrition Examination Survey (KNHANES), conducted by the Korean Ministry of Health and Welfare. This cross-sectional nationwide representative survey has been conducted to evaluate health and nutritional status of Korean population, using a stratified, multi-stage sampling with a probability proportional to size. BMD was measured during 2008–2011 in KNHANES and categorized into 3 groups according to the World Health Organization’s criteria. MetS was diagnosed according to the criteria from a joint scientific statement endorsed by major organizations including National Heart, Lung, and Blood Institute. Postmenopausal women without a history of hormone therapy or osteoporosis medication were included and women with uncertain menopausal status were excluded from analysis. Finally, a total of 3,594 postmenopausal women were included to determine the association between BMD and MetS. Results: Overall 1,573 postmenopausal women (46.3%) had MetS and mean age of women with MetS were 80cm, which is cut-off value for Asian women (0.622 g/cm² vs 0.612 g/cm²). Conclusion: In conclusion, MetS is not associated with BMD in Korean postmenopausal women, but high waist circumference has a positive relationship with FN BMD. Sources of Funding: The present study was supported by grant no 04-2015-0920 from the SNUH Research Fund.

P-9.
No association between serum vitamin D level and bone mineral density or BMD change over 4.6 years in postmenopausal Korean women

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Object: The aim of this study is to determine the prevalence of vitamin D deficiency in postmenopausal women of Pusan and Gyeongnam province in Korea and to evaluate its correlation with bone mineral density and metabolic syndrome. Design: Study subjects were 332 postmenopausal Korean women with a mean age of 54.5 years who visited Pusan National University Yangsan Hospital from January 2013 and December 2017. All data is derived from the initial laboratory result and measurement at first visit. Serum 25-hydroxyvitamin D (25(OH)D) by chemiluminescence immunoassay was used to evaluate the vitamin D status. Bone mineral density (BMD) was measured with dual-energy X-ray absorptiometry in lumbar vertebral and femur. Vitamin D deficiency was defined according to the National Osteoporosis Society guideline 2013. The new International Diabetes Federation definition was used as diagnostic criteria for metabolic syndrome (MS). Results: Clinical characteristics of our study population are shown in table 1. The prevalence of suboptimal vitamin D level of this study which includes deficient (<12 ng/ml) and inadequate (<20ng/ml) was 60.2% and vitamin D status was not different among three groups according to serum 25(OH)D level (sufficient vs. insufficient vs. deficient groups). In addition, there was no correlation between serum vitamin D level and BMD change over 4.6 years in postmenopausal Korean women. Conclusion: About 60% of postmenopausal women of Pusan and Gyeongnam province of Korea had suboptimal serum 25(OH)D level. This study did not show significant correlation between vitamin D status and BMD change over 4.6 years in postmenopausal women.
P-11. Associated Factors to Bone Mineral Density Among Midlife Women: A Population-Based Study

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Objective: Introduction: Osteoporosis has become a health problem especially for midlife women, due to the estrogen decline and growing longevity. Several factors contribute to reduce bone mineral density (BMD) in midlife women. The aim of this study was to evaluate factors related to BMD in midlife women sample. Design: This is a longitudinal population-based study of menopausal status, conducted in Passo Fundo, in Southern Brazil. A first cross-sectional study was performed in 1995 and a second wave was assessed in 2001. A third follow-up was initiated in 2010. A total of 301 women were enrolled. Seventeen women were excluded due to previous hysterectomy and could not be classified according to menopausal status, resulting in a sample of 284 women (pre-, peri- and postmenopause). Through standard questionnaire demographic characteristics, current use of hormone therapy (HT) for menopausal complaints, smoking status (no, past or current use) and alcohol intake (g/day) were collected. Anthropometric measurements were performed in duplicate and included body weight, height. Assessment of habitual physical activity (PA) was performed with a digital pedometer (BP 148, Techline, São Paulo, Brazil), during 7 days. Subjects were encouraged not to alter their PA habits during the study. The sum of the steps/day was averaged over the total period time. Participants were classified as physically inactive (<6000 steps/day) or active (≥6000 steps/day). Serum 25(OH)D (≤15ng/ml) was measured for all participants, and the BMD was measured with a recent ultrasonic bone densitometer (Diasonor, Stellwag, USA). BMD was assessed in the lumbar spine (LS), femoral neck (FN) and total femur (TF) by dual-energy X-ray absorptiometry and expressed in g/cm². Analysis of variance and the X² test were used to analyze the characteristics of the sample associated with the presence of menopause using a model that was set up to test the individual variables on the bone mass. Results: The mean age was 57.4±5.4 years. The majority of participants were Caucasian (82.7%) and postmenopausal women (83.4%), with median time of menopause of 70 months. HT was used by 15.8% of peri- and postmenopausal women. Current smoking was found in 19.3%. Regarding PA, the median of steps was 16,000 steps/day. Current smoking had a negative association with BMD; BMI and 25(OH)D showed a positive association with BMD. Conclusion: The mean age was 57.4±5.4 years. The majority of participants were Caucasian (82.7%) and postmenopausal women (83.4%), with median time of menopause of 70 months. HT was used by 15.8% of peri- and postmenopausal women. Current smoking was found in 19.3%. Regarding PA, the median of steps was 16,000 steps/day. Current smoking had a negative association with BMD; BMI and 25(OH)D showed a positive association with BMD.

P-12. Melatonin and mefloquine effects in bone tissue of rats in the permanent estrous phase

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Objective: To evaluate and compare the effects of melatonin and mefloquine in the alveolar process and periodontal ligament of rats in the permanent estrous. Design: 35 adults, albino and virgins female rats, at the age of 3 months of were kept in cages with water and food ad libitum. Seven of these animals were maintained on 12 hours light/dark cycle and was considered the Sham Group (Sham). The others 28 animals were kept in continuous light for four weeks, to induce a state of permanent estrous. This was confirmed by daily collection of vaginal swabs for 21 consecutive days. The animals were then equally divided into the following groups: Control Group (PE): Group treated with Melatonin (0.4 mg / ml) diluted in drinking water (MELA); Group treated with Mefloquin (50 mg / kg) by gavage (MET) and Group treated with Mefloquin associated (MELA+MET). All groups were fed ad libitum. Animals were anesthetized and euthanized by transcardiac perfusion and fragments containing the maxillary alveolar process and periodontal ligament of the first molar were removed, fixed, dehydrated in EDTA and processed for paraffin embedding. Some sections were stained with hematoxylin and eosin for histomorphometric analysis and others for picrosirius Red method and immunohistochemistry method for detection of osteocalcin and Hyaluronic Acid. Results: The bone area of the alveolar process, the thickness of the periodontal ligament as well as the intensity of birefringence of collagen fibers were higher in PE (p<0.05) when compared to Sham and MELA+MET Groups, whereas similar results were found among the MET and MELA+MET Groups. Osteocalcin immunostaining showed higher positivity in both the osteoblasts of alveolar process and cells of the periodontal ligament of EP, MET and MELA+MET Groups, as compared to the Sham and MELA Groups, whereas Hyaluronic Ac immunostaining appeared similar among the groups. Conclusion: Isolated Melatonin effect appeared to be more efficient in the maintenance of bone area and periodontal ligament thickness of rats in the permanent estrous phase.

Sources of Funding: None

P-13. Poor Nutrition and Weight Loss in Young Adulthood has Persistent Effects on Menopausal Bone Health

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Objective: The finding of a severely low bone mineral density (BMD) score in the perimenopausal period raises suspicion for inadequate bone accretion in the premenopausal years. We present two patients with history of amenorrhea and eating disorders with severe osteoporosis and fractures in early menopause. Design: Case report. Results: Case 1: A 55-year-old Caucasian woman with anorexia nervosa (AN) presented to clinic for osteoporosis. She reported AN and over-exercising since age 10. She ascribed to a vegan/vegetarian diet since late teens, with occasional bone broth. She had long periods of amenorrhea until menopause at age 44. Patient had her first fracture at age 48 when she fell down two flights of stairs, resulting in multiple thoracic compression fractures. A bone density scan showed a BMD T-score of -5.8 at the spine. She continued to sustain multiple fractures from age 49-51: metatarsal fractures without preceding trauma, rib fractures from a fall while walking, and a pelvic fracture from a fall similar to her initial injury. The patient saw an osteodensitometry specialist a few months after the fracture and had calculated calcium intake of three servings a day but avoiding dairy. Her exam at that time was notable for a weight of 43.5 kg and a BMI of 15.9 kg/m². Laboratory work-up revealed a 25-hydroxyvitamin D level of 6 ng/ml, and she was started on vitamin D 3000IU daily for possible osteomalacia, followed by anabolic therapy with teriparatide, which she self-discontinued after only 2 weeks due to back pain. A repeat bone density scan 12 months later showed unchanged spine T-score of -5.7. She was lost to follow up until she presented again two years later with a spine T-score of -6.1. Because she was averse to anabolic therapy, hormone replacement therapy was offered in addition to dietary counseling. Case 2: A 58-year-old Caucasian woman presented to clinic for osteoporosis. She had amenarche at age 11, followed by a year of irregular menses, then developed amenorrhea after significant weight loss. Irregular menses resumed when she regained weight to a peak of 68.9 kg around age 17. She has had 2 children without incident. Menopause occurred around age 47. Four years later, she started to lose weight again, to a low of 40.8 kg and BMI 15.5 kg/m². Her first fracture occurred at age 53 when she fell on the street and fractured the head of the humerus. The following year, she fractured her left shoulder, right wrist, and pelvis in the setting of three separate bike accidents. Patient denied excessive exercise and reported a vegetarian/ vegan diet. On exam, she weighed 45.0 kg with a BMI of 17.0 kg/m². Labs were notable for hypoparathyroidism, anemia, low FSH of 0.3 mIU/ml [ref: 5.8-134.8 mIU/ml], elevated beta-carotene at 173 mcg/dl [ref: 3-91 mcg/dl], and mildly elevated 24-hour free cortisol of 61 mcg/d [ref: <50 mcg/d]. A bone density scan showed a spine T-score of -4.6. She was placed on hormone replacement (estradiol 0.5mg/norlandone acetate 0.1mg). The patient was also seen by a metabolic bone specialist who started her on teriparatide. The BMD improved by 2% at the spine and 8% at the hip in 6 months. At follow-up, she was started on Anabolic therapy was followed by denosumab. Her most recent bone density, after 10 months of denosumab and 1.8 kg of weight gain, showed improvement to -3.7 at the spine. Conclusion: Early epidemiologic studies observed the severity of low bone mass in young women with AN. Recent studies showed that a history of AN is an independent predictor of BMD improvement. Presentation of severe osteoporosis in the perimenopausal woman with a history of abnormal menses should prompt further investigation into diet and weight history.

Sources of Funding: None

P-14. Effects of long-term postoperative use of dienogest on bone mineral density in patients with endometriosis

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Objective: The current treatment strategy for endometriosis includes the long-term similar use of medicaments after surgery to prevent the recurrence of symptoms and lesions. Several studies have demonstrated the efficacy, safety and tolerability of dienogest (DNG) for the treatment of endometriosis. As DNG inhibits ovulation, there could be concern about its negative effect on bone health, especially with long- treatment. This study was performed to evaluate the effects of long-term postoperative use of DNG on bone mineral density (BMD) in patients with endometriosis. Design: The clinical data of 53 reproductive-aged women who had been treated with
Model Calculated Breast Cancer Risk Assessment of Women Attending Community Breast Cancer Education Events

Lisa C. Larkin MD, MDF, Alexandra Magnante, BS1. Lisa Larkin MD and Associates, Cincinnati, OH; 1Clinical Research Center, Cincinnati Children’s Hospital, Cincinnati, OH

Objective: Most women are aware that one in eight women will develop breast cancer in her lifetime, and of guidelines recommending annual mammography; however, most women are unaware of their individual risk of breast cancer, the estimate that 30% of breast cancer is related to lifestyle, or prevention strategies. The objective of our study was to inform women in Cincinnati, OH about their individual breast cancer risk using validated risk assessment tools, educate them about lifestyle strategies for risk reduction, and identify women who might benefit from genetic counseling, enhanced screening, or chemoprevention. Providing women with a model-calculated risk assessment and education may empower women to pursue strategies for breast cancer risk reduction, and individualized breast cancer care.

Design: Five breast cancer risk assessment events, advertised through web and social media, were held in Cincinnati, OH between August 2017 and January 2018. Attendees completed a questionnaire to calculate lifetime breast cancer risk using the Tyner-Cusick (V8) and Gail models. Women with a history of breast cancer were excluded; those under age 35 were excluded from Gail Model calculation, and women without breast density information were excluded from Tyner-Cusick (V8) calculation. Risk assessment results and personalized recommendations were provided to each woman at each event in advance of a 50-minute educational lecture about breast cancer risk factors, risk assessment models, prevention strategies, and screening. Genetic counseling referral was suggested based on NCCN guidelines; consideration of chemoprevention was recommended to women with a Gail Model 5-year risk greater than 3%; lifestyle modification was recommended to women at a lifetime risk >15% and enhanced screening was recommended to women at a lifetime risk greater than 20%, calculated by Tyner-Cusick (V8).

Results: A total of 91 women registered for the events and completed the questionnaire. Attendees’ ages ranged from 23 to 80, with a mean age of 51. One woman was excluded because of a personal history of breast cancer. Eighty-one women had Gail Model risk calculated; nine women under age 35 were excluded. Fifty-six women (62.2%) provided breast density information and had Tyner-Cusick (V8) risk calculated. Ninety participants, 24 (26.7%) met NCCN guidelines for genetic consultation. Of the 81 participants who had Gail Model risk assessment performed, five (6.2%) met criteria for chemoprevention. Of the 56 women who had Tyner-Cusick (V8) model risk assessment performed, 24 (42.9%) of women were identified to have a risk ≥15 mm Hg, with absolute value ≥40 mmHg, or ≥17 kg/m2. Thirty-two women met TX-001HR eligibility, 15, 13 had weight increases and 13 had weight decreases (Table). Incidence of hypertension considered related to treatment was low (E2/P4: 0.2-1.2%; placebo: 0%). Discontinuation rates due to weight gain (E2/P4: 0.2-0.9%; placebo: 0.7%) or hypertension (E2/P4: 0.0-5.0%; placebo: 0.7%) were also low. Conclusion: The phase 3 REPLENISH trial showed a significant effect of TX-001HR on moderate-to-severe VMS in menopausal women with a uterus with no clinically significant differences in adverse events compared with placebo (Lobo RA et al, Obstet Gynecol, in press). Additionally, vital sign data from this trial presented here demonstrated that up to 12 months of TX-001HR use had minimal changes and no clinically important effects on body weight or BP in menopausal women. These encouraging data suggest that TX-001HR may improve vasomotor symptoms in a new oral TX-004 E2 option for treating moderate-to-severe VMS in menopausal women with a uterus.

Sources of Funding: TherapeuticsMD

Table. Changes from Baseline to Month 12 in Body Weight and Blood Pressure with TX-001HR

<table>
<thead>
<tr>
<th>Measurement</th>
<th>E2/P4 (n=57)</th>
<th>TX-001HR (n=56)</th>
<th>Placebo (n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline BMI</td>
<td>25.9 (6.1)</td>
<td>25.6 (5.6)</td>
<td>26.0 (6.0)</td>
</tr>
<tr>
<td>Mean change at month 12</td>
<td>-0.2 (5.2)</td>
<td>-0.1 (3.8)</td>
<td>-0.2 (5.1)</td>
</tr>
<tr>
<td>Total decrease in BMI</td>
<td>1.1 (1.4)</td>
<td>0.9 (1.8)</td>
<td>1.2 (1.4)</td>
</tr>
<tr>
<td>Systolic BP, mm Hg</td>
<td>Baseline mean</td>
<td>132 (20)</td>
<td>131 (19)</td>
</tr>
<tr>
<td>Mean change at month 12</td>
<td>0.5 (1.0)</td>
<td>0.3 (0.9)</td>
<td>0.2 (1.0)</td>
</tr>
<tr>
<td>Total decrease in systolic BP</td>
<td>1.2 (1.3)</td>
<td>1.0 (1.1)</td>
<td>1.2 (1.1)</td>
</tr>
<tr>
<td>Diastolic BP, mm Hg</td>
<td>Baseline mean</td>
<td>78 (11)</td>
<td>77 (11)</td>
</tr>
<tr>
<td>Mean change at month 12</td>
<td>-0.5 (1.0)</td>
<td>-0.3 (1.2)</td>
<td>-0.5 (1.2)</td>
</tr>
<tr>
<td>Total decrease in diastolic BP</td>
<td>0.8 (1.7)</td>
<td>0.8 (1.7)</td>
<td>1.0 (1.8)</td>
</tr>
</tbody>
</table>

E2/P4: estrogen/progesterone; TX-001HR: a new oral E2/P4 option for treating moderate-to-severe VMS in menopausal women with a uterus.
P-17. Effects of bazedoxifen on physical activity and body composition in ovarioctomized female mice
Christopher H. Fort, EFSC CLGT, Angola Lindsay, Cory W. Baumann, Dawn A. Lowe, University of Minnesota, Minneapolis, MN
Objective: Menopause is associated with decreased levels of physical activity. Estrogen treatment after ovarioctomy in mice has been shown to reverse and prevent this decline. Selective estrogen receptor modulators (SERMs) are a class of drugs which work through the estrogen receptors with a tissue-selective effect. Bazedoxifen is the newest generation SERM to be FDA approved in conjunction with conjugated estrogen for prevention of postmenopausal osteoporosis and treatment of moderate to severe hot flashes. The tissue specific effects of bazedoxifen have yet to be fully elucidated. The purpose of this study is to determine the effects of bazedoxifen on levels of physical cage activities and body composition after ovarioctomy in mice. Design: Forty C57BL/6j mice were randomized into four groups: sham/placebo, O VX/placebo, O VX/e2, O VX/bza. Echo MRI for body composition was performed prior to and after ovarioctomy (OVX) surgery. 24 h cage activity measures were collected 8 wk after surgery. Results: Mice treated with O VX/placebo and O VX/bza gained more weight than sham/placebo and O VX/e2 treated mice over the 8-wk trial. In addition, fat mass increased by 8% in O VX/placebo and O VX/bza treated mice as compared to O VX/e2 treated mice (p < 0.001). Total time spent being active was no different among groups (p = 0.075). Conclusion: Despite no differences in levels of cage activities, bazedoxifen did not protect against ovx-induced fat mass gain.

Sources of Funding: NIH Grant R01 AG031743

P-18. Effects of soybean isoflavones in rats model with metabolic syndrome
Adriana F. Carbone, Post Doctoral 1,2, Ricardo S. Simões, Post doctoral fellow 1,2, Gisele R. Fortes, Post doctoral fellow 1,2, Edmund C. Baracat, Professor 1, Jose M. Soares Junior, Professor 2, 1. Morphology and Genetics, Universidade Federal de São Paulo, São Paulo, Brazil; 2Obstetrics and Gynecology, University of São Paulo, São Paulo, Brazil
Objective: We have two dependent hypotheses. The first is related to the metabolic syndrome could address the pathophysiology of the postmenopause. To understand if in metabolic syndrome the activation of PPAR is affected leading to the deregulation of lipid metabolism and if isoflavone can restore lipid homeostasis through the re-activation of PPARy in the liver. Design: We used 30 female rats that after birth from 1 to 5 days were administered subcutaneously 0.1mg / kg of testosterone propionate. After induction the rats were divided into three groups and endometrium removes (ovariocitized): GI: sham group, GII: rats treated with propylene glycol vehicle and GIII: rats treated with soy isoflavones 150 mg/kg; rats were monitored daily for two consecutive months. At the end of the experiment, the rats were anesthetized and euthanized using a deepening of the anesthetic plane. The endometrium and liver were collected and processed for analysis of morphology and molecular biology. The ANOVA test was used, followed by the Bonferroni test. Results: Showed that control rats increased body weight (p < 0.01) compared to isoflavones (P < 0.01). Interestingly, no differences were found in relation to food intake in any of the groups, which demonstrated that the reduction in body weight of the GIII group is due to the effects of FSI and not due to food consumption. Along with an increased body weight of the control rats there was a significantly decrease insulin sensitivity (p < 0.001) compared to ISF-treated, which were able to increase insulin significantly (P < 0.01). A morphological analysis of the endometrium showed ISF did not proliferate endometrial epithelium (p > 0.01). The analysis of lipids in the liver showed that FSI and E2 reduced triglycerides but E2 was not significantly more effective than FSI. Conclusion: Isoflavones in the study did not show the re-activation of PPARy in the liver and FSI did not produce the effects seen with estrogen. These findings are in agreement with previous reports in which isoflavones have shown its potential in the treatment of metabolic syndrome.

Sources of Funding: This study was funded by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) Number: 2014/17077-9

P-19. Soybean isoflavones decreases oxidative stress in the vagina of type 1 diabetic rats
Adriana F. Carbone, Post Doctoral 1,2, Ricardo S. Simões, Post doctoral fellow 1,2, Jose M. Soares Junior, Professor 1,2, Edmund C. Baracat, Professor 1, Jose M. Simões, Professor 1, 1. Morphology and Genetics, Universidade Federal de São Paulo, São Paulo, Brazil; 2Obstetrics and Gynecology, University of São Paulo, São Paulo, Brazil
Objective: To assess the effects of isoflavones and 17β-estradiol related to oxidative stress and apoptosis on the vaginal epithelium of a diabetic rat model. Design: Sixty adult, virgin, female rats underwent ovarioctomy were randomized into six groups of ten animals each: GI = Sham control ovarioctomized animals; GII = Sham control diabetic ovarioctomized animals; GIII = control ovarioctomized that received propylene glycol vehicle; GIV = control diabetic ovarioctomized animals receiving propylene glycol vehicle; GV = diabetic ovarioctomized animals treated with soy isoflavones (150mg/kg by gavage); GVII = diabetic ovarioctomized animals receiving isoflavones (17β-estradiol, 10mg/kg, subcutaneously). Treatment took place over 30 consecutive days. After euthanasia, a portion of the vagina was immersed in liquid nitrogen for RT-qPCR and western blotting (Bax and BCL-2), and another portion was processed for paraffin embedding. Sections were stained with hematoxylin and eosin and immunohistochemistry with Ki67 as well as VEGF. The levels of reactive oxygen species, total antioxidant capacity and lipid peroxidation were analyzed as biomarker of oxidative stress. Results: Treatment with bazedoxifen showed a largest increase in the layers of vagina epithelium than with isoflavones. These hypertrophic effects agree with expression elevation of Ki67 and VEGF, which did not occur with the caspase 3, indicating that isoflavones have great proliferative effect in the vagina. Similar results were also observed on superoxide quantification, PCR and western blotting, which show that isoflavone has a protective effect against oxidative stress in diabetic rats. Conclusion: Our results indicate positively the trophic therapeutic potential of isoflavones, which mean a protective effect and can contribute to the development of effective therapies to decrease the symptoms of menopause.

Sources of Funding: This study was funded by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) Number: 2014/17077-9

P-20. Association of Adiponectin and Vitamin D Level in the Obese Pre- and Postmenopausal Women
Suwan Yawwichai, M.D. 1, Unnop Jaisamram, M.D., M.Sc.1, Ammarin Suwan, M.D. 2, Sukanya Chaikittisilpa, M.D., M.Sc. 1, 1Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand; 2Department of Obstetrics and Gynecology, King Chulalongkorn Memorial Hospital, Bangkok, Thailand
Objective: To study the association between level of serum adiponectin and level of serum vitamin D in the obese premenopausal and postmenopausal women.

Design: Cross-sectional analytic study

Results: This cross-sectional study was conducted at the King Chulalongkorn Memorial Hospital in cooperation with Chula Clinical Research Centre (Chula-CRC) from December 2016 to July 2017. It had been approved by Chulalongkorn Institutional Review Board (IRB). One hundred and nineteen obese Thai women, aged 45 to 55 years, were recruited in this cross-sectional study. There were 60 premenopausal women and 59 postmenopausal women with body mass index (BMI) > 30 kg/m2. We measured weight, height, hip and waist circumference. The percentage of body fat and visceral fat were measured by bioelectrical impedance analysis (BIA) technology with Tanita SC-330. (Table 1) Serum adiponectin and serum 25-hydroxy vitamin D (25OHD) were analyzed by ELISA method and chemiluminescence method, respectively. Descriptive and correlation statistics by Pearson and Spearman’s rho were performed. Serum adiponectin in premenopausal group (7.7 ± 3.7 µg/ml) was significantly higher than premenopausal group (5.6 ± 3.8 µg/ml) (p = 0.003). Serum vitamin D in postmenopausal group (15.2 ± 6.4 ng/ml) was significantly lower than premenopausal group (20.2 ± 4.7 ng/ml) (<0.001). There was no correlation between adiponectin and vitamin D in both groups (r = -0.049, p = 0.71 and -0.167, p = 0.21 in pre- and post-menopause, respectively).

Conclusion: Serum adiponectin showed no correlation with serum vitamin D in the obese premenopausal and postmenopausal women.

Sources of Funding: Ratchadapiseksomphot Endowment Fund, Faculty of Medicine, Chulalongkorn University

Table 1. Participants baseline characteristics

<table>
<thead>
<tr>
<th>Group</th>
<th>Postmenopausal</th>
<th>Premenopausal</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mean ± SD)</td>
<td>(Mean ± SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>51.0 ± 1.6</td>
<td>53.9 ± 1.7</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Body Mass Index (BMI kg/m²)</td>
<td>28.1 ± 2.3</td>
<td>26.4 ± 2.3</td>
<td>0.18</td>
</tr>
<tr>
<td>Waist Circumference (cm)</td>
<td>98.2 ± 8.2</td>
<td>98.9 ± 8.3</td>
<td>0.64</td>
</tr>
<tr>
<td>Hip Circumference (cm)</td>
<td>102.7 ± 7.3</td>
<td>104.6 ± 7.4</td>
<td>0.29</td>
</tr>
<tr>
<td>% Body Fat</td>
<td>39.3 ± 2.5</td>
<td>59.5 ± 2.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Visceral Fat Rating Scale</td>
<td>8.8 ± 1.7</td>
<td>10.1 ± 1.7</td>
<td>0.34</td>
</tr>
<tr>
<td>Muscle Mass (g)</td>
<td>38.7 ± 2.8</td>
<td>56.2 ± 2.9</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Figure 1 Correlation of Adiponectin and Vitamin D in Pre- and Postmenopause Group

P-21. Association of carotid artery intima-media thickness increase in patients with osteoporosis diagnosis
EUNICE ZAVALA CHAPARRO, DOCTOR, ANA CAROLINA SALAZAR ROMO, RESIDENTE, Imelda Hernandez Marin, Head of the Human Reproduction Biology service. HUMAN REPRODUCTION BIOLOGY, HOSPITAL IJAREZ DE MEXICO, Mexico City, Mexico

Objective: To identify the association of carotid artery intima-media thickness increase in patients with osteoporosis. Secondary objective: to gain knowledge of the frequency of atheroma plate and its calcification in patients with osteoporosis. Design: Cross-sectional observational, and descriptive study. Patients diagnosed with osteoporosis were evaluated through carotid arteryography to measure the intima-media thickness. The examination was made to patients diagnosed with osteoporosis (n=40) in the
Climacteric and Osteoporosis clinics of the Human Reproduction Biology service of the Hospital Juárez de México from May 2017 to May 2018. The selected patients were compared with a control group of the same age without an osteoporosis diagnosis (n=46).

**Results:** After measuring the bone mineral density (T-score) and performing a carotid ultrasound, both variables were correlated with a Spearman and Mann-Whitney test. The findings indicate that there is a negative correlation (reverse) between the LS (lumbar segment) T-score and the average carotid intima-media thickness that is statistically significant (Spearman test -0.31, p<0.005). Chart 1. Also a negative correlation (reverse) was found between the LH (left hip) T-score and the average carotid intima thickness that is statistically significant (Spearman test -0.31, p<0.005). Chart 2. The patients with osteoporosis had a significantly greater thickness of the intima-media (mean 0.71 vs. 0.67 Mann-Whitney p<0.05). The patients with osteoporosis had atheromatous plaque more frequently than the control patients (15 vs. 7.9%). In the calcification analysis, the patients with osteoporosis had frequency of 12%, while none of the control patients presented it.

**Conclusion:** The patients with osteoporosis presented greater thickness of the carotid intima-media when compared with patients without osteoporosis. They also presented atheroma plaque and its calcification more frequently, when compared with patients without osteoporosis. This finding may imply the direct association of osteoporosis in cardiovascular disease.

**Sources of Funding:** NONE

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**P-22.**

**Evaluation of the main diagnostic component of metabolic syndrome that causes more damage to the female sexual response: final findings**

SONIA MARIA ROLIM ROSA LIMA, PhD1, Gustavo M. Dutra da Silva, PhD student2, BENEDITO F. DOS REIS, PhD, PhD. SOSTENES POSTIGO, MD1, Carolina F. Macruz1. 1Obstetrics and Gynecology, Santa Casa of Sao Paulo Medical School, Sao Paulo, Brazil; 2São Francisco University, Bragança Paulista, Brazil

**Objective:** To evaluate the diagnostic component of Metabolic Syndrome with greater impact in sexual response in postmenopausal women. Women: A cross-sectional, prospective, case-controlled study was carried out by interviewing 1,100 postmenopausal women at the Climacteric of the FCMSCSP and of the HMLMB. Women are regularly seen in these institutions to perform routine climacteric exams. After performing care and evaluation of inclusion and exclusion criteria, 291 women were invited to participate in the study. All participants signed the Free and Informed Consent Form. The women considered as being postmenopausal were those with amenorrhea a year 1 and FSH ≥ 30mIU/mL. Sexual function was assessed by completion of the Female Sexual Function Index (FSFI). A score of 5 or less on the combination of items comprising the desire domain of the FSFI questionnaire was used to define the diagnosis of HSDD. The types of diagnosis based on the DSM-IV-TR. The diagnosis of sexual dysfunctions was established by a sexology specialist experienced and trained in diagnosing FSD using structured clinical interviews. The Beck Depression Inventory was used to exclude depression in patients with a history of the disease. The MetS diagnosis was determined by following the guidelines defined by the Adult Treatment Panel (ATP) III (8): (1) Abdominal circumference (AC) ≥ 88cm; (2) HDL-cholesterol < 46mg/dL; (3) triglycerides ≥ 150mg/dL; (4) arterial blood pressure (SAP) ≥ 130/85mmHg; and (5) fasting glucose ≥ 110mg/dL. The women considered as carrying MetS were those with at least three of the components described. Results: The study was carried out in compliance with the protocol and principles established in the Declaration of Helsinki (1996 version), the International Conference on Harmonisation Tripartite Guideline and with the Guidelines for Good Clinical Practice and applicable regulatory requirements.

**Results:** After measuring the bone mineral density (T-score) and performing a carotid ultrasound, both variables were correlated with a Spearman and Mann-Whitney test. The findings indicate that there is a negative correlation (reverse) between the LS (lumbar segment) T-score and the average carotid intima-media thickness that is statistically significant (Spearman test -0.31, p<0.005). Chart 1. Also a negative correlation (reverse) was found between the LH (left hip) T-score and the average carotid intima thickness that is statistically significant (Spearman test -0.31, p<0.005). Chart 2. The patients with osteoporosis had a significantly greater thickness of the intima-media (mean 0.71 vs. 0.67 Mann-Whitney p<0.05). The patients with osteoporosis had atheromatous plaque more frequently than the control patients (15 vs. 7.9%). In the calcification analysis, the patients with osteoporosis had frequency of 12%, while none of the control patients presented it.

**Conclusion:** The patients with osteoporosis presented greater thickness of the carotid intima-media when compared with patients without osteoporosis. They also presented atheroma plaque and its calcification more frequently, when compared with patients without osteoporosis. This finding may imply the direct association of osteoporosis in cardiovascular disease.

**Sources of Funding:** NONE

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**P-23.**

**Metabolic changes with randomized hormone therapy and associations with coronary heart disease in the Women’s Health Initiative**

Kathryn Rexrode, MD, MPH1, Olga Demler, PhD2, Nina Paynter, PhD3, Simin Liu, MC, ScD3, JoAnn E. Manson, MD, MPH4, Raji Balasubramanian, ScD3, Bhavna S. Bhatia1, JoAnn E. Manson1, Kathryn Rexrode, MD, MPH1, Olga Demler, PhD2, Nina Paynter, PhD3, Simin Liu, MC, ScD3, JoAnn E. Manson, MD, MPH4, Raji Balasubramanian, ScD3, Bhavna S. Bhatia1

**Objective:** To evaluate the diagnostic component of Metabolic Syndrome with greater importance in clinical practice. The study was designed to determine if there was a direct correlation between the diagnostic components of MetS that cause more sexual dysfunction and the diagnosis of HSDD. The diagnosis of HSDD was based on the DSM-IV-TR. The diagnosis of sexual dysfunctions was established by a sexology specialist experienced and trained in diagnosing FSD using structured clinical interviews. The Beck Depression Inventory was used to exclude depression in patients with a history of the disease. The MetS diagnosis was determined by following the guidelines defined by the Adult Treatment Panel (ATP) III (8): (1) Abdominal circumference (AC) ≥ 88cm; (2) HDL-cholesterol < 46mg/dL; (3) triglycerides ≥ 150mg/dL; (4) arterial blood pressure (SAP) ≥ 130/85mmHg; and (5) fasting glucose ≥ 110mg/dL. The women considered as carrying MetS were those with at least three of the components described. Results: The study was carried out in compliance with the protocol and principles established in the Declaration of Helsinki (1996 version), the International Conference on Harmonisation Tripartite Guideline and with the Guidelines for Good Clinical Practice and applicable regulatory requirements.

**Results:** After measuring the bone mineral density (T-score) and performing a carotid ultrasound, both variables were correlated with a Spearman and Mann-Whitney test. The findings indicate that there is a negative correlation (reverse) between the LS (lumbar segment) T-score and the average carotid intima-media thickness that is statistically significant (Spearman test -0.31, p<0.005). Chart 1. Also a negative correlation (reverse) was found between the LH (left hip) T-score and the average carotid intima thickness that is statistically significant (Spearman test -0.31, p<0.005). Chart 2. The patients with osteoporosis had a significantly greater thickness of the intima-media (mean 0.71 vs. 0.67 Mann-Whitney p<0.05). The patients with osteoporosis had atheromatous plaque more frequently than the control patients (15 vs. 7.9%). In the calcification analysis, the patients with osteoporosis had frequency of 12%, while none of the control patients presented it.

**Conclusion:** The patients with osteoporosis presented greater thickness of the carotid intima-media when compared with patients without osteoporosis. They also presented atheroma plaque and its calcification more frequently, when compared with patients without osteoporosis. This finding may imply the direct association of osteoporosis in cardiovascular disease.

**Sources of Funding:** NONE
P-24.


Imelda Hernández Marin, Head of the Human Reproduction Biology Service, ANA CAROLINA SALAZAR ROMO, RESIDENT HUMAN REPRODUCTION BIOLOGY, EUNICE ZAVALA CHAPARRO, RESIDENT HUMAN REPRODUCTION BIOLOGY, Hospital Júarez de México, Mexico City, Mexico.

Objective: Establish the relationship between breast vascular calcifications and cardiovascular disease risk (CVD), based on the American Heart Association (AHA) scale, in post-menopausal women of the Human Reproduction Biology Service of the Hospital Júarez de México.

Design: A sample of 206 patients was used to calculate the frequency of breast vascular calcifications, showing 16% with a confidence level of 95%.

Two hundred and six menopausal patients who went to the menopause clinic from September 1, 2017 to April 30, 2018 were chosen (post-menopausal stage 2 in accordance with STRAW >10). A bilateral mammography and the lipid profile were requested for all the patients. We calculated the CVD using the AHA tool. The mammographic images were examined to identify the presence or absence of vascular calcifications. The Mann Whitney U test and X² were used for the statistical analysis.

Results: A statistically significant relationship was identified between cardiovascular risk and the presence of breast vascular calcifications (P<0.05, RR 5.97, OR 19.53, CI 95% 5.97-112.94, p=0.009). Heart rate variability in group 1 presented SDNN 29.42±12.59 (p=0.027) and group 2 schooling and group 2 48.12±9.68 (p<0.05). Heart rate variability in group 1 presented SDNN 29.42±12.59 (p=0.027) and group 2 schooling and group 2 48.12±9.68 (p<0.05). Heart rate variability in group 1 presented SDNN 29.42±12.59 (p=0.027) and group 2 schooling and group 2 48.12±9.68 (p<0.05).

The groups were homogeneous regarding menarche age, body mass index, and smoking habits. A statistically significant relationship was identified between cardiovascular risk and the presence of breast vascular calcifications (P<0.05, RR 5.97, OR 19.53, CI 95% 5.97-112.94, p=0.009). Heart rate variability in group 1 presented SDNN 29.42±12.59 (p=0.027) and group 2 schooling and group 2 48.12±9.68 (p<0.05).

Conclusion: This study shows that the presence of breast vascular calcifications is a risk factor for cardiovascular disease, and that the relationship between breast vascular calcifications and cardiovascular disease risk is statistically significant. Future studies should be carried out to investigate the relationship between breast vascular calcifications and cardiovascular disease risk in post-menopausal women.

Sources of Funding: None

P-25.

Relationship between age and cardiac autonomic modulation in climacteric women in Western Amazonia.

Patricia M. Martineili1, Rodrigo D. Raimundo, PhD2, Alex R. Norberto1, Valdelías X. Pereira, PhD1, Isabel C. Sorpreso, PhD3, Luiz C. de Abreu, PhD2, 1Faculdade de Medicina do ABC FMAB, São Paulo, Brazil; 2União Educacional do Norte UNINORTE, Rio Branco, Brazil; 3Faculdade de Medicina FMUSP, Universidade de São Paulo, São Paulo, Brazil.

Objective: To evaluate the behavior of cardiac autonomic modulation according to the intensity of menopausal symptoms in climacteric women.

Design: A cross-sectional study was conducted at the Rio Branco Municipal Health Department, Acre, from October 2016 to July 2017. All study participants signed the informed consent form. The research was approved by the Ethics and Research Committee (1,748,393/2016).

The study population is comprised of women aged 40-65 years, with menopausal symptoms following the criteria of diagnosis of Crematorium. Exclusion criteria were: use of antidepressants, angiotensin-converting enzyme inhibitors, beta-blockers, feverish state; cardiomyopathies, decompensated heart failure; use of hormone therapy; abnormal bleeding; psychosis, depression; systemic arterial hypertension; arterial calcification; and atrial fibrillation. A statistically significant relationship was identified between cardiovascular risk and the presence of breast vascular calcifications (P<0.05, RR 5.97, OR 19.53, CI 95% 5.97-112.94, p=0.009) and in the vasomotor symptoms (group 1: 1.69±0.79, p<0.05) and group 2: 4.37±3.40, p<0.0001).

When we verified the intensity of menopausal symptoms it was observed that there was homogeneity among the groups, regardless of the symptomatology present in relation to age, menarche age, menopause age, body mass index, circumcision and systolic blood pressure. The variables were statistically significant and increased in the group with moderate to severe symptomatology. The present study revealed that the intensity of cardiovascular risk (CVD) is associated with menopause symptoms in climacteric women, which is in agreement with the findings of other studies. In conclusion, the presence of breast vascular calcifications is associated with an increase in cardiovascular risk in post-menopausal women. Future studies should be carried out to investigate the relationship between breast vascular calcifications and cardiovascular disease risk in climacteric women.

Sources of Funding: None

P-26.

Relation of menopausal symptoms with autonomic cardiac modulation.

Wendy Mack, PhD 1,2. 1Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, CA; 2TherapeuticsMD, Boca Raton, FL.

Objective: To evaluate the behavior of cardiac autonomic modulation according to the intensity of menopausal symptoms in climacteric women. Design: A cross-sectional study was conducted at the Rio Branco Municipal Health Department, Acre, from October 2016 to July 2017. All study participants signed the informed consent form. The research was approved by the Ethics and Research Committee (1,748,393/2016).

The study population is comprised of women aged 40-65 years, with menopausal symptoms following the criteria of diagnosis of Crematorium. Exclusion criteria were: use of antidepressants, angiotensin-converting enzyme inhibitors, beta-blockers, feverish state; cardiomyopathies, decompensated heart failure; use of hormone therapy; abnormal bleeding; psychosis, depression; systemic arterial hypertension; arterial calcification; and atrial fibrillation. A statistically significant relationship was identified between cardiovascular risk and the presence of breast vascular calcifications (P<0.05, RR 5.97, OR 19.53, CI 95% 5.97-112.94, p=0.009) and in the vasomotor symptoms (group 1: 1.69±0.79, p<0.05) and group 2: 4.37±3.40, p<0.0001).

When we verified the intensity of menopausal symptoms it was observed that there was homogeneity among the groups, regardless of the symptomatology present in relation to age, menarche age, menopause age, body mass index, circumcision and systolic blood pressure. The variables were statistically significant and increased in the group with moderate to severe symptomatology. The present study revealed that the intensity of cardiovascular risk (CVD) is associated with menopause symptoms in climacteric women, which is in agreement with the findings of other studies. In conclusion, the presence of breast vascular calcifications is associated with an increase in cardiovascular risk in post-menopausal women. Future studies should be carried out to investigate the relationship between breast vascular calcifications and cardiovascular disease risk in climacteric women.

Sources of Funding: None

P-27.

Effect of Estradiol Dose and Serum Estradiol Level on Coagulation and Anti-coagulation Factors in Early and Late Postmenopausal Women in the REPLENISH trial.

Intira Siripradit, MD 1, Howard Hodis 1, Brian Bernick, MD 1, Sebastian Mirkin, MD 1, Wendy Mack, PhD 2. 1Preventive Medicine, Keck School of Medicine, University of Southern California, Los Angeles, CA; 2Atherosclerosis Research Unit, Keck School of Medicine, University of Southern California, Los Angeles, CA; TherapeuticsMD, Boca Raton, FL.

Objective: This post-hoc analysis evaluated the association of randomized estradiol (E2) dose and achieved serum E2 level on coagulation and anti-coagulation factors in early (<6 years) compared with late (≥10 years) postmenopausal women in the REPLENISH trial.

Design: REPLENISH was a randomized, double-blinded, placebo-controlled, multi-center trial testing endometrial safety and efficacy on moderate-to-severe vasomotor symptoms of TX-001HR, an investigational, oral combined E2 and progesterone (P4) 1 mg/400 µg oral tablet, 0.5 mg/50 µg (5 mg/50 mg) gel ingested as part of androgen agonist in postmenopausal women. Mixed-effects linear models tested the association of E2 dose and serum E2 level on coagulation and anti-coagulation factors; prothrombin time (PT), partial thromboplastin time (APTT), antithrombin (AT), fibrinogen (FIB), protein C (PROC), and protein S (PROTS) over 12 months adjusted for serum P4. The change...
in each factor was estimated per 0.25 mg E2 dose and per 1 mg/L serum level of E2 dose. The level of serum P4 level was also evaluated. Results: A total of 1327 early and 318 late postmenopause women were included. Mean age (SD) was 53.1(6.7) years vs. 58.4(4.1) years; mean time-since-menopause was 2.4(1.8) years vs. 14.2(3.9) years in early and late postmenopause. Late-postmenopausal women had higher systolic blood pressure and lower serum E2 levels at baseline (p=0.05). Demographic characteristics across E2 dose groups were similar. Higher E2 dose was significantly associated with reduced AT (p=0.001) and PROTC (p=0.0006) in late postmenopause, and with lower AT and PROTC in both early and late postmenopause. With longer time-since-menopause, the inverse E2 dose effect on all coagulation and anticogulation factors became stronger (p interaction<0.001). Higher serum E2 level was significantly associated with lower AT (p=0.001) and PROTS (p=0.002) in early postmenopause, lower PT (p=0.02) among early and late postmenopause and lower PROTC in both early and late postmenopause. With longer time-since-menopause, the inverse serum E2 level effect on PT, PROTC, and FIB became stronger (p interaction<0.05). No significant main effect of serum P4 level was found. Conclusion: E2 dose and serum E2 level were significantly associated with decreased coagulation and anti-coagulation factors among early and late postmenopause women, and the effect was stronger with longer time-since-menopause. Serum P4 level did not alter the association between E2 dose and serum E2 level with any coagulation or anti-coagulation factor. TX-001HR had no effect on PT in early postmenopausal women, whereas in late postmenopausal women PT was significantly decreased with increasing E2 dose and serum E2 level. These results suggest that timing of estradiol therapy and serum E2 level related to time-since-menopause could modify venous thromboembolism (VTE) risk. 1Hodis HN, Mack WI, Hendrix VW, Shoupe D, Budoff MJ, Hwang-Levine J, et al. Vascular Effects of Early versus Late Menopause Treatment with Estradiol. New England Journal of Medicine. 2016;374(13):1221-31.

Sources of Funding: TherapeuticsMD grant

Regression estimate of coagulation and anti-coagulation factors change per 0.25 mg increase of E2 dose and 1 mg/L serum increase of E2 level by time-since-menopause (years)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimate</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT (sec)</td>
<td>-0.06</td>
<td>-0.09, -0.03</td>
<td>0.001</td>
</tr>
<tr>
<td>APTT (sec)</td>
<td>-0.01</td>
<td>-0.002, -0.01</td>
<td>0.034</td>
</tr>
<tr>
<td>AT (%)</td>
<td>-0.07</td>
<td>-0.08, -0.06</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>PROTS (%)</td>
<td>-0.06</td>
<td>-0.05, -0.07</td>
<td>0.0001</td>
</tr>
<tr>
<td>FIB (L/mL)</td>
<td>-0.03</td>
<td>-0.04, -0.02</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Estimates are from mixed effect model adjusted for baseline measure and P4 level "*tests interaction between E2 dose, E2 level with time-since-menopause (years)"

P-28.

Effect of Cimicifuga racemosa on metabolic parameters in women with menopausal symptoms – a retrospective cohort study (CIMBLOC)

Petr Stute, M.D.1, Lena Ost, M. D.2, Lukas Buettikofer, Ph. D.3, Sabine Nebel, Ph. D.4, Catherine Zahner4. Obstetrics and Gynecology, Inselspital Bern, Bern, Switzerland; Institute of Social and Preventive Medicine (ISPM), University Bern, Bern Switzerland; Zeller Medical AG, Romanshorn, Switzerland

Objective: To explore the relationship between Cimicifuga racemosa (CR) and metabolic parameters in symptomatic menopausal women. Design: Monocenter retrospective cohort study. Women above age 40 with first consultation between 2009-2016 were screened. Women treated with either MHT or CR treatment and having at least one follow-up consultation were included. Outcome parameters (lipids, glucose, insulin, HOMA-IR) and menopausal symptoms (Menopause Rating Scale (MRS)-II). Cantonal ethic committee No 2016-01179. Statistical analysis parameters (lipids, glucose, insulin, HOMA-IR) and menopausal symptoms (Menopause Rating Scale (MRS)-II). Cantonal ethic committee No 2016-01179. Statistical analysis was performed using uni- and multivariate linear mixed-effects regression assuming a linear effect of time.

Results: 769 women were screened, 174 women were eligible for analysis (CR: n=32, MHT: n=142). Baseline characteristics (age, BMI, fasting lipid profile, fasting glucose, insulin, HOMA-IR, blood pressure, serum hormones) did not differ between groups. However, reproductive stage differed significantly with more CR (55%) treated than MHT (55%) women being post-menopausal (p=0.038) while total MRS-II score did not differ between groups. Median follow-up time was 12 months. In both groups, mean change per year was not significant for body weight and serum levels, glucose, insulin and HOMA-IR. With MHT, total MRS-II significantly improved (+0.95 [95% CI -1.17, -0.74]) per year, p<0.001 and +0.64 [95% CI -1.26, -0.01], p=0.045. Total MRS-II had the same trend (+1.43 [95% CI -3.16, 0.30], p=0.11). Intergroup comparisons did not reveal significant differences for any endpoint or when adjusting for confounders.

Conclusion: In contrast to treated menopausal women, body weight and metabolic parameters did not change in symptomatic women treated with either MHT or CR. Both, MHT and CR significantly improved menopausal symptoms.

Sources of Funding: Zeller Medical AG, Romanshorn, Switzerland

P-29.

Relationship between blood oxidative stress markers and cardiovascular disease risk in Mexican women in process of aging

Martha A. Sanchez-Rodriguez, PhD1, Mariano Zacarias-Flores, OB/GYN MD2, Victor Manuel Mendoza-Nuñez, PhD3. ‘Unidad de Investigacion en Gerontologia, Facultad de Estudios Superiores Zaragoza, UNAM, Mexico City, Mexico; ‡División de Ginecologia y Obstetricia, Hospital General Dr. Gustavo Baz Prada, Nezahualcoyotl, Mexico

Objective: To determine the relationship among different oxidative stress biomarkers and the 10-year cardiovascular risk score in middle age and older women. Design: We carry out a cross-sectional study with 558 community-dwelling women (40-69 year) from Mexico City (healthy, diabetic or hypertensive) divided in three groups: a) 200 premenopausal women (47.1±3.4 yr), b) 251 early postmenopausal women (51.7±3.3 yr) and c) 107 late postmenopausal women (62.5±3.4 yr). We measured plasma malondialdehyde level (MDA) by the TBARS assay, erythrocyte superoxide dismutase (SOD) and glutathione peroxidase (GPx), uric acid level and total plasma anti-oxidant status (TAS) in the women as oxidative stress biomarkers. Results: One hundred nine women (20%) had high CR risk, which ranged (51%) were late postmenopausal women. SOD and GPx activities, and TAS level were statistically lower in women in high CR risk (Table). A negative correlation between SOD activity and CR risk score was observed (r=-0.125, p<0.01). GPx activity and HDL cholesterol level were also shown loss negative correlation. MDA levels were not significant. A multi-variant model including MDA levels and antioxidant biomarkers showed SOD activity to be the main contributor to explain the increase in CR risk score, since for every 0.1U/g Hb decrease in SOD activity, every 0.1 U/G decrease in MDA level, and every 0.1 U/G decrease in anti-oxidant enzymes decrease in CR by 10-years Framingham CVD risk score increase, showing a low response to oxidative events when the women aging.

Results of Funding: This work was supported by grant DGAAPA-UNAM IN306517.

Table. Results of oxidative stress indices stratified by 10-years cardiovascular disease risk.

<table>
<thead>
<tr>
<th>Antioxidant</th>
<th>Without risk</th>
<th>Mild risk</th>
<th>Moderate risk</th>
<th>High risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOD (U/g Hb)</td>
<td>1.70±0.10</td>
<td>1.20±0.12</td>
<td>1.10±0.14</td>
<td>0.67±0.14</td>
</tr>
<tr>
<td>GPx (U/L)</td>
<td>515±166</td>
<td>521±173</td>
<td>640±119</td>
<td>487±254</td>
</tr>
<tr>
<td>TAS (mnol/L)</td>
<td>3.90±2.40</td>
<td>1.06±1.37</td>
<td>1.10±1.19</td>
<td>0.97±0.84</td>
</tr>
</tbody>
</table>

One-way ANOVA with Dunnett test as posthoc, *p<0.05, **p<0.001, ***p=0.01. SOD: superoxide dismutase, GPx: glutathione peroxidase, TAS: total antioxidant status.

GENITOURINARY/VAGINAL HEALTH POSTER PRESENTATIONS

P-30.

Efficacy and Safety of Ospemifene in Menopausal Women with Moderate to Severe Vaginal Dryness: A Phase 3, Randomized Double-Blind Placebo-Controlled Multicenter Clinical Trial


Objective: Genitourinary syndrome of menopause (GSM), comprising vulvovaginal atrophy (VVA), impacts the health and quality of life of postmenopausal women. Genital symptoms of VVA include vaginal dryness as a main bothersome symptoms (MBS) which often time leads to sexual dysfunction and emotional distress and remains a condition of unmet need. The objective of the study was to evaluate the safety and efficacy of ospemifene, an oral, selective estrogen receptor modulator and nonhormonal option, for the treatment of vaginal dryness as the MBS of postmenopausal women with VVA. Design: This Phase 3, multicenter, randomized, double-blind, placebo-controlled study assessed the efficacy and safety of ospemifene in menopausal women with vaginal dryness as MBS of VVA. Eligible subjects were postmenopausal, age 40-80 with moderate to severe vaginal dryness as a self-reported MBS of VVA. Subjects were randomized
P.31.
A 17βestradiol, Softgel, Vaginal Capsule (TX-004HR) had an Early Onset of Action for Treating Vulvar and Vaginal Atrophy (VVA) and Moderate-to-Severe Dyspareunia

Ginger Constantine, MD,1 Leah S. Millheiser, MD,2 Andrew M. Kaunitz, MD,3 Shellia Graham, PhD,4 Brian Bernick, MD,4 Sebastian Mirkin, MD,4 Constantine et al, 3,4

Objective: An investigational, vaginal softgel capsule with low-dose solubilized 17βestradiol (TX-004HR; TherapeuticsMD, Boca Raton, FL), designed to be rapidly dissolving and mucoadhesive, significantly improved superficial and parabasal cell percentages, vaginal pH, and dyspareunia vs placebo in menopausal women with VVA and moderate-to-severe dyspareunia in the phase 3 REJOICE trial (NCT02253173; Constantine et al, Menopause 2017;24:409-16). The objectives were to determine responder rates at wk 2 and wk 2 findings may predict wk-12 responders. Design: In the REJOICE trial, menopausal women with VVA and dyspareunia received TX-004HR 4 μg, 10 μg, or 25 μg, or placebo for 12 wks. Responders had ≥2 of the following: vaginal superficial cell percentage ≥5%, vaginal pH <5.0, or improvement from baseline of ≥1 category in dyspareunia a1 category. In the efficacy evaluable (EE) population, the proportion of responders was calculated by dividing the number of positive responders by women with available responder data. Odds ratios for a positive response at wk 12 given a positive response at wk 2 were calculated. Results: Of 764 enrolled, 695 constituted the EE population. The proportion of responders was 74%-82% with TX-004HR doses vs 24% with placebo at wk 2, and 72%-80% vs 33% at wk 12 (Figure 1). The odds of being a responder with TX-004HR were 9- to 14-fold higher than that with placebo at wk 2, and 5- to 6-fold higher at wk 12. When all women (independent of treatment) were analyzed, similar percentages of responders were observed at wk 2 (65%) and wk 12 (66%). When women taking active treatment only were analyzed in aggregate, 80% respond at wk 2 and 78% at wk 12. In addition, of women who responded at wk 12, 85% had responded at wk 2. Being a responder at wk 2 highly predicted being a responder at wk 12 in the total EE population (OR 13:1; 95% CI, 8.8-19.7) and in the active treatment groups only (OR 7:9; 95% CI, 4.7-13.2). Conclusion: A consistent effect of TX-004HR in menopausal women with moderate-to-severe dyspareunia was observed as early as 2 weeks of therapy as shown by the high percentage of responders. A positive response to TX-004HR at wk 2 predicted a positive response at wk 12.

Sources of Funding: TherapeuticsMD

Figure 1: Responders with TX-004HR at Weeks 2 and 12

P.32. Introsuits as a Surrogate Site for Vaginal pH and Biomolecules: Pre-menopausal vs Post-Menopausal Women Comparison

Miranda Farage, Ph.D., Gina fadayel, B.S, MT-ASCP, Hong Jian Dai, Yuli Song, Ph.D., Yu Wang, M.Sc. Corporate R&D, Procter and Gamble, Mason, OH

Objective: Post-menopause is usually associated with major physiological, biophysical, anatomical and microbiological changes as compared to the reproductive years. These changes can lead to unique symptoms that might affect women’s quality of life. In general, objective measures for vaginal atrophy (VA) rely mainly on obtaining specimens/data from the vaginal area. For many women with VA, the vaginal opening (e.g. introitus) may constrict and lose elasticity thereby making it difficult and unpleasant to have a practitioner obtain samples from the vaginal area. However, objective measures of VA are largely restricted to vaginal pH and vaginal maturation index which typically require insertion of a speculum to create adequate access to the internal area. These vaginal procedures are invasive and can be painful especially among women who suffer from VA. The goal is to reduce the painful vaginal procedures many women with VA experience during sample collections and clinical evaluation. A research program was initiated to investigate whether the introitus can be used as a surrogate site for the vagina. The objective is to investigate whether the introitus reflects the vaginal site, we conducted a clinical study to evaluate certain bio-molecular measures, protein levels, and pH in both pre-menopausal and post-menopausal women. Design: A total of 20 female subjects (age 21-70), who met all entrance criteria and signed the informed consent, were enrolled in the study and assigned to one of two groups; 10 pre-menopausal females (Pre-M), 10 post-menopausal females receiving no hormone replacement therapy (Post-M Non-HRT) and showing signs of atrophy. The pH was measured using pH litmus paper. Quantification of biomolecules was obtained from two genital sites of interest: vagina and introitus from both Pre-M and Post-M groups using the Medscand Cytobrush Plus Kit (used for standard Pap Smear Test). Results: As expected, the vaginal pH was significantly higher for the Post-M Non-HRT group as compared to the Pre-M group since we specifically recruited post-menopausal women with vaginal atrophy. When the pH was compared in the introitus vs. vaginal of pre-M, values were very similar: 4.2 ± 0.42 vs. 4.1 ± 0.32, respectively. For the post-menopausal group, the pH was 7.5 ± 0.18 at the introitus vs. 7.0 ± 0.84 in the vaginal area. The concentrations of glycogen, lactic acid, total Natural Moisturizing Factor (NMF), and prolactin were significantly higher in pre-menopausal vs postmenopausal groups at both genital sites. However, very similar levels were obtained between introitus and vaginal of each group. The total NMF and prolactin suggest a greater hydration level in pre-menopausal vs. postmenopausal women. Protein levels were significantly higher in the pre-menopausal vs. post-menopausal at both sites. The Introitus protein levels were higher than the vaginal site in both groups. Conclusion: Limited biomolecular and biophysical data exist comparing different genital sites of pre-M vs. post-M women. There were significant differences in biomolecular concentrations in the genital area between pre and postmenopausal women on non-HRT. The initial differences in biomarkers suggest reduced glucose metabolism and hydration in post-menopausal vs. pre-menopause women. Similarities in pH and biomolecular concentrations in introitus vs. vaginal support that the introitus is a suitable surrogate skin site for obtaining certain vaginal measurements. Additional clinical studies support these findings. The more we can find similarity between introitus & vaginal sites the more we can alleviate the pain of women specially with vaginal atrophy symptoms, to improve their Quality of life.

Sources of Funding: None
P-33. Randomized, Double-blind, Placebo-controlled Multicenter Study to Evaluate Vulvar Health from Photograph Images Taken at Investigative Sites of Women Participating in the Efficacy and Safety of Ospemifene in Patients with Moderate to Severe Vaginal Dryness, a Symptom of Vulvovaginal Atrophy (VVA) due to Menopause

Irwin Goldstein, MD1, James Simon, MD2, Andrew M. Kaunitz, MD3, Corrado Altomare4, Yuki Yoshida 4, Julie Zhu 4, Samuel Schaffer 5, Graziella Soulban 5. 1Sexual Medicine, Alvarado Hospital, San Diego, CA; 2Women’s Health Research Consultants, Washington, DC; 3University of Florida, Jacksonville, FL; 4Shionogi Inc., Florham Park, NJ; 5Duchesnay Inc., Blainville, QC, Canada

Objective: The goal of this trial was to validate the use of vulvar photography for assessment of vulvar health in women with moderate to severe vaginal dryness due to menopause in a large study. This multicenter, randomized, double-blind, placebo-controlled study assessed the efficacy and safety of ospemifene 60 mg QD in postmenopausal women (age 40-80) with moderate to severe vaginal dryness as the most bothersome symptom (MBS) of VVA due to menopause. Three experts independently assessed vulvar photographs using the multi-item Vulvar Imaging Assessment Scale (VIAS) to measure vulvar anatomical effects of ospemifene versus placebo. A secondary aim was to compare imaging data from the VIAS to other objective measures in the study including Vaginal and Vulvar Health Indices, assessed by investigators at each site. The Vaginal Health Index (VHI) evaluated fluid secretion, overall elasticity, pH, condition of epithelial mucosa, moisture. The Vulvar Health Index (VHI) is a visual examination rating labia majora, labia minora, clitoris, introitus appearance and elasticity, color, discomfort and pain, presence of other findings, as normal/mild/moderate/severe. Design: Images were captured at research sites with a Canon SL1 camera system, sent to a dedicated secure digital monitoring system and uploaded to a platform (Sciton, PA). Photographs were reviewed by three independent reviewers. The reviewers underwent technical/logistical training, then independently assessed vulvar images based on pre-established criteria using a color calibrated 27° high resolution standardized color monitor. They were blinded to subject identifiers, investigator information and treatment arm. Study photographs were graded (none, 0; mild, 1; moderate, 2; severe, 3) and evaluated for each of 9 criteria: labia majora loss, labia minora loss, clitoris size, urethral glans prominence, introital stenosis, introital pallor, introital erythema, introital moisture, mucosal inflammation, and other findings as outlined by the VIAS. Results: 631 subjects were enrolled, randomized, and included in the intention-to-treat population (ospemifene=316; placebo=315). The VIAS score, range 0-27, was graded at baseline and Wk 12, with lower values indicating better vulvovaginal health. The mean VIAS score at baseline was similar in both treatment groups (ospemifene, 13.8; placebo, 14.1). The difference between treatment groups in least square (LS) mean change from baseline in mean VIAS total score was -1.0 (p = 0.0118) at wk 12, representing a greater decrease in the ospemifene group relative to the placebo group. The VHI, range 5-25, was graded at baseline and Wk 12, with higher values indicating better vulvar health. The mean VHI total score at baseline was 13.0 in both groups. The difference between groups in LS mean change from baseline in VHI total score was 2.5 at Wk 4, 2.9 at Wk 8, and 2.8 at Wk 12 (all p < 0.0001), representing greater increases in the ospemifene group. The VuHl, range 0-21, was graded at baseline and Wk 12, with lower values indicating better vulvar health. The mean VuHl total score at baseline was similar in both groups (ospemifene, 7.6; placebo, 7.7). The difference between groups in LS mean change from baseline in VuHl total score was -0.8 (p = 0.0002) at Wk 4 and -1.1 to -1.2 at Wks 8 and 12 (both p < 0.0001), a statistically significant decrease in the ospemifene group relative to placebo. Conclusion: Use of vulvar photography assessed by the VIAS was correlated with Vaginal and Vulvar Health Indices. These results were consistent with the improvement of vaginal dryness as the MBS of postmenopausal women with VVA. This approach to assess MBS of menopausal women should be considered for future clinical trials. Sources of Funding: None

P-34. A Retrospective Single Center Study of Longitudinal Vulvoscopic Findings of Photographic Images of the Vulva, Vestibule, Urethral Meatus and Vagina in Menopausal Women with Female Sexual Dysfunction Pre- and Post-Hormonal Treatment

Stephanie da Silva, MD1, Sue W. Goldstein, BA, CSE, CCC3,4,5, Irwin Goldstein, MD2,3,4,5. 1Sexual Medicine, Alvarado Hospital, San Diego, CA; 2Sexual Medicine, Alvarado Hospital, San Diego, CA; 3San Diego Sexual Medicine, San Diego, CA

Objective: Genitourinary syndrome of menopause (GSM) is associated with signs and symptoms of genitourinary atrophy secondary to estradiol and androgen deficiency. It is hypothesized that longitudinal vulvoscopic assessment utilizing photographic images of the vulva, vestibule, urethral meatus and vagina would allow the health care provider to objectively “monitor” effectiveness of hormone therapy in menopausal women with symptoms of GSM. Design: This single site retrospective study examined longitudinal vulvoscopic findings documented by photographic images of the vulva, vestibule, urethral meatus and vagina to examine the clinical benefit of hormonal replacement strategies on management of menopausal women with sexual dysfunctions and GSM. Bioidentical hormonal therapy is designed to keep serum estradiol, progesterone and calculated free testosterone values levels at ideal values considered 25 - 50 pg/ml, 1.0 ng/ml and 0.8 ng/dl, respectively. Management also includes daily topical vestibular and introital lubrication, use of vaginal suppository estradiol and testosterone cream and more recently intravaginal DHEA inserts. Both naturally and surgically menopausal women were included who were either peri-menopausal or post-menopausal at their initial visit, with at least one follow-up vulvoscopy. Women who had undergone cosmetic vulvar or vestibular surgery were excluded. Vulvoscographic photographic images of women at their initial presentation and after hormone treatment were examined. Photographs from August 1, 2007 through December 1, 2017 displaying the vulva, vestibule, urethral meatus and vagina were reviewed. Results: A total of 110 menopausal women (mean age 62 ± 13 years) with sexual health complaints met inclusion and exclusion criteria. A total of 2125 vulvoscopic photographic images were reviewed. The mean follow-up from initial office visit was 2.6 ± 1.3 years. In all 110 cases, pre-treatment vulvoscopic photographic images showed varying degrees of resorption of labia minora, telescoping of the urethral meatus, atrophy of the glans clitoral, vestibular erythema and pallor, minimally robust peri-urethral tissue, and minimal vaginal rugae with thin, pale and dry vaginal mucosa. Longitudinal vulvoscopic photographic image changes in 61% of cases revealed varying degrees of improved genital tissue health as assessed by the presence of pink, moist, vestibular tissue with re-growth of the labia minora, loss of urethral meatal telescoping, growth of the clitoral glans, and growth of the anterior vaginal wall per urethral tissue. Non-compliance with medications, medication side effects, excessive medication costs, and other health care provider discontinuation of medications were the chief reasons for failure. Conclusion: Longitudinal vulvoscopic photographic images of women in menopause with sexual dysfunction and GSM can be utilized to effectively “monitor” genitourinary tissue health changes associated with hormone therapy. Sources of Funding: None

P-35. Safety and Efficacy of Hybrid Fractional Laser for Symptoms of GSM: Prospective Multi-Center Study: 3 and 6 Month Interim Analysis

Nathan L. Guerette, MD, FACOG, FPMRS57,7,7,7. Intimate Wellness Institute, Richmond, VA; 2Female Pelvic Medicine Institute, Richmond, VA

Objective: Genitourinary syndrome of menopause (GSM) is a new terminology to describe symptoms occurring secondary to vulvovaginal atrophy. Energy based devices including laser and radio-frequency devices have demonstrated positive results in treatment of GSM. This is the first multi-center prospective study to evaluate the safety and efficacy of hybrid fractional laser utilizing simultaneous delivery of 2940nm Erbium and 1470nm Diode wavelengths to treat symptoms of GSM. Design: Prospective, multi-center study at 5 centers in U.S., 51 peri- and post-menopausal females (mean age 59±6.5) with at least 2 self-reported symptoms of GSM enrolled. 33 subjects completed 3 month follow-up visit and 24 subjects completed 6 month follow-up visit. This is findings of those subjects. Baseline demographics and exam recorded. Vaginal Health Index Scale (VHIS), Vaginal Maturation Index (VMI), Female Sexual Function Index questionnaire (FSFI), and Day-to-Day Impact of Vaginal Aging questionnaire (DIVA) scores collected at baseline and follow-up visits. Histological samples collected at baseline, 3, 6 and 12 month follow-up visits. Subjects received 3 treatments at 4 week interval (settings: 1470nm – 200-600 um [density 6-15%], 2940nm – 200-300 um [density 7-14%]). Follow-up visits conducted at 1, 3, 6 and 12 months after third treatment. Results: FSFI demonstrated significant improvement in all domains at 3 and 6 months (p<0.05) percent improvement of 44-164% (table 3). DIVA scores had significant improvement in all domains at 3 and 6 months with decrease in % of parabasal cells and increase in % of superficial cells. Overall VMI improved 12% at 3 months and 18.5% at 6 months. VHIS statistically improved in all domains (elasticity, epithelial integrity, lubrication) with a percent improvement of 58-153% (table 2). Significant histological changes occurred with 100% increase in epithelial thickness at 6 months and 54% change at 3 months (Figure 1). No adverse events reported. Conclusion: The 3 and 6 month data demonstrates that the hybrid fractional laser, with simultaneous delivery of 2940nm (VHIS), 1470nm Diode wavelengths is safe and efficacious treatment for GSM with statistical improvements in vaginal health, sexual function, and quality of life. Sources of Funding: Sciton (Palo Alto, CA, USA)

Table-1: FSFI p-values and percent improvement

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<th>Source</th>
<th>Domain</th>
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<th>6 month</th>
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<tr>
<td>VMI</td>
<td>M</td>
<td>0.01</td>
<td>0.01</td>
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<tr>
<td>VMI</td>
<td>% Improvement</td>
<td>44</td>
<td>164</td>
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<tr>
<td>VMI</td>
<td>M</td>
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</tr>
<tr>
<td>VMI</td>
<td>% Improvement</td>
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<td>100</td>
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Table 2: VHIS p-value and % Improvement

<table>
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<th>Domain</th>
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<th>6 month</th>
</tr>
</thead>
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<tr>
<td>VMI</td>
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<td>VMI</td>
<td>Fluid Volume</td>
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<tr>
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</tr>
<tr>
<td>VMI</td>
<td>% Improvement</td>
<td>58</td>
<td>153</td>
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</tbody>
</table>

Table-2: FSFI p-values and percent improvement
P-36. Improvement of vaginal vascularization in postmenopausal women with genitourinary syndrome with isoflavones derived from Glycine max (L.) Merr vaginal gel.

Juliana V. Honorato, Masters, SONIA MARIA ROLIM ROSA LIMA, PhD, Maria Antonieta L. Galvão da Silva, Professor Doctor. Gynecological endocrinology and Menopause, Irmandade Santa Casa de Misericórdia de São Paulo, São Paulo, Brazil

**Objective:** To analyze the effect of the isoflavones derived from Glycine max (L.) Merr vaginally in the improvement of the vascularization of the vaginal epithelium.

**Design:** A pilot project, double-blind, randomized, placebo-controlled was carried out, including 9 patients, randomly assigned to Group 1 (Isoflavones) and Group 2 (Placebo).

**Group 1** received 1g of isoflavone vaginal gel derived from Glycine max (L.) Merr 4% with a plastic applicator, for daily use during 12 weeks. Group 2 received 1g of placebo gel, with similar package, color and consistency, used in the same way. Vaginal microbiopsies were collected before and after the 12 weeks of treatment. Histological and immunohistochemical analysis was performed to count blood vessels per field in the vaginal epithelium, before and after the intervention. The data were evaluated using Mann-Whitney and Wilcoxon tests.

**Results:** There was no significant difference between groups in terms of age, time after menopause, weight, BMI and basal number of blood vessels per field in vaginal epithelium (Table 1). After intervention, the increase in vessels of Group 1 (isoﬂavones) was statistically significant (p: 0.043), which was not observed in Group 2 (p: 1.0) (Table 2), and the difference of both groups was significant (p: 0.014) (Figure 1).

**Conclusion:** Preliminary results showed that Glycine max (L.) Merr treatment significantly increased vaginal wall vascularization in postmenopausal women compared to placebo.

**Sources of Funding:** FAPESP - Fundação de Amparo à Pesquisa do Estado de São Paulo

**Table 1:** Patient baseline characteristics (mean, median, SD*, minimum, maximum and pValue**

**Table 2:** Comparison of blood vessels per field values at baseline and 12 weeks in Group 1 (Isoflavones) and Group 2 (Placebo), medians and pValue*

**Figure 1:** Comparison of number of blood vessels per field before (blue), and after 12 weeks of treatment (green), in Group 1 (Isoflavones) and Group 2 (Placebo)

**P-37.** Nella™ NuSpec™ is a Novel Tool for Increased Comfort for Peri and Post Menopausal Patients during Intravaginal Exams

Maria Lalli1, Michael Krychman, MD2; CEEK Women’s Health, Portland, OR; 3Southern California Center for Sexual Health, Newport beach, CA

**Objective:** Genitourinary syndrome of menopause includes vaginal atrophy that affects women in their peri and postmenopausal stages of life. Symptoms include a drop in estrogen, leading thinning of vaginal tissues, and causing dyspareunia and discomfort during intravaginal exams. As a result, many women avoid pelvic exams due to anxiety over the potential for this discomfort. Current specula are not designed to optimize comfort for these patients and often result in this level of discomfort for the patient in order for the clinician to obtain optimal visibility and accessibility. The Nella NuSpec is a Class II, FDA-exempt speculum developed to improve the experience of an intravaginal exam. The design focuses on narrow bills for increased patient comfort and enhanced visibility enabled by integrated retractor for vaginal tissue sidewall retention. The speculum also has a novel handle and locking mechanism design that is ergonomic for both patient and clinician, and is made of an autoclavable polymer that is warm to the touch and does not require the addition of lubricant for comfortable insertion.

**Design:** An IRB-approved (ClinicalTrials.gov, # NCT03123367) interventional, randomized, controlled, parallel-assignment study was conducted to evaluate the product across 2 clinical sites. Women aged 18 and over who met screening criteria were invited to participate. 41 women were enrolled (n=20 device, n=21 control) between the ages of 24 and 68 (mean age 48.3). Informed consent was documented and HIPAA-compliant and protected data was collected on paper forms through patient and clinician post-exam questionnaires. Participants were compensated with a gift card (50USD). Reported here is one arm of a larger 4 arm study. Of the 41 women, 32 were of typical perimenopausal or postmenopausal age and included in this analysis. A smaller subset of women (n=13; 31.7%) were postmenopausal and are an additional analysis.

**Results:** Patient Results: For the subset of patients 40 and over, when asked to compare to their previous exam, 80% of patients (12 of 15) in the device arm rated the exam as better or significantly better than 23.5% (4 of 17) in the control arm. When comparing to their last exam, 100% of postmenopausal NuSpec patients (5 of 5) reported that this exam felt better or significantly better. For all patients 40 and over in the device group, 93.3% (14 of 15) agreed or strongly agreed that the speculum felt comfortable overall and upon insertion vs. 82.3% (14 of 17) of those in the control group who experienced the device, 100% agreed or strongly agreed the NuSpec felt comfortable upon insertion vs. 62.5% of postmenopausal patients that experienced the control device (5 of 8 patients). Clinician Results: During 86.7% (13 of 15) of device exams with women over age 40, clinicians agreed or strongly agreed that visibility was good, while in the control group that percentage was 76.5% (13 of 17). In terms of providing easy access, in 86.7% of device exams (13 of 15), clinicians agreed or strongly agreed, while in the control group the percentage was 64.7% (11 of 17) agreeing or strongly agreeing and 17.6% (3) disagreeing or strongly disagreeing and 17.6% (3) unsure. Analyzing only the postmenopausal exams, clinicians stated they agreed or strongly agreed on good visibility for 100% of device exams (5 of 5), while in the control group the value was 75% (6 of 8). Similarly, with 100% (5 of 5) of NuSpec exams on postmenopausal patients, clinicians agreed or strongly agreed that the device provided easy access to the cervix vs. during control exams, clinicians agreed on good accessibility during only 62.5% of exams (5 of 8). No adverse events were reported. Conclusion: While demonstrating increases in patient comfort, the NuSpec also showed improvements in visibility and accessibility for clinicians with peri and postmenopausal patients. NuSpec™ is a novel speculum option that provides clinicians an opportunity to improve comfort for peri and postmenopausal patients by considering the symptoms of genitourinary syndrome of menopause, leading to potentially increased patient satisfaction (an important emerging quality metric in health care delivery) and increased visit compliance.

**Sources of Funding:** Funding: CEEK Women’s Health

**Figure 1:** Comparison of number of blood vessels per field before (blue), and after 12 weeks of treatment (green), in Group 1 (Isoflavones) and Group 2 (Placebo)

**P-38.** The Placebo Effect for a Medical Device Treating Vaginal Laxity

Michael Krychman, MD1; Stacie Bell, PhD2; Deborah Wilkerson2. 1Southern California Center for Sexual Health, Newport beach, CA; 2Medical affairs, Viveve Medical, Englewood, CO

**Objective:** There is substantial placebo effects when examining therapeutic interventions for female sexual health. Some studies estimate that the placebo effect can be as high as 40-50%. With increasing intervention, it is known that the placebo effect becomes may become more pronounced and one would anticipate a significant placebo effect from a medical device such as radiofrequency and or laser intervention. Randomized controlled trials that are blinded and have a placebo study design are of paramount importance as is the need for longitudinally following up participants for accurate documentation of adverse effects. Many prospective case series, while support provocative results for implementing innovative technology in the field of sexual gynecology, robust RCT is sparse. This radiofrequency trial was conducted to determine the placebo effect for a medical device treating women who are complaining of vaginal laxity/looseness or the potential for this discomfort. Many prospective case series, while support provocative results for implementing innovative technology in the field of sexual gynecology, robust RCT is sparse. This radiofrequency trial was conducted to determine the placebo effect for a medical device treating women who are complaining of vaginal laxity/looseness or the potential for this discomfort.

**Design:** A prospective, longitudinal, randomized, blinded, placebo-controlled, multicenter clinical study was carried out for the treatment of vaginal laxity. This international study is the first and only of its kind ever done for the medical treatment for the condition of vaginal laxity. Subjects were treated in a 2:1 ratio to either active (40 J/cm2) or sham (≤1 J/cm2) treatment groups. Nine sites were chosen in multiple countries (Italy, Spain, Canada and Japan). Subjects were followed up at 72 hrs, 10 days, and 1, 2, 3, and 6 months post-treatment. Patient reported outcomes included a 7-point likert scale assessment for vaginal laxity. **Results:** A total of 155 subjects that did not have any major protocol deviations are included in this analysis. Results show a statistically significant,
clinically meaningful difference at 6 months between active and sham, with the active group times more likely to report “no laxity” (p = 0.006). However, the sham treatment group showed a substantial treatment effect itself, with a 31%, 33%, and 19% increase in “no laxity” at months 1, 3, and 6, respectively. Conclusion: In order to adequately power and design future research initiatives, investigators must take into account the possibility of a substantial “sham” effect for laxity and vaginal function studies; underscoring the importance of placebo/sham-controlled trials to ensure that the effect being seen is actually due to the investigational technological intervention or product. Further RCT with a sham controlled arm should become the goals standard when assessing efficacy and safety for a novel medical device in gynecological care.

Sources of Funding: This research was funded by Viveve Medical

P-39. Lubrication Improvement in the Sub Analysis Report From The Viveve I Trial: Effect of Single-Session, Cryogen-Cooled Monopolar Radiofrequency Therapy on Sexual Function. Michael Keychman, MD1, Hank haasbroek, Stacie Beitz, PhD2, Deborah Wilkerson2. 1Southern California Center for Sex Health, Newport beach, CA; 2Medical affairs, Viveve Medical, Englewood, CO

Objective: Vaginal laxity is a patient reported impactful medical condition often self-defined as the complaint of “excessive vaginal looseness”. Vaginal laxity is considered to result primarily from stretching of the introitus during vaginal delivery and to be associated with reduced vaginal sensation during intercourse, reduced sexual satisfaction, with subsequent negative impact on self-esteem and sexual relationships. Recent data is emerging that demonstrates improved sexual function and satisfaction in women with vaginal laxity who have undergone “vaginal rejuvenation” procedures including surgery, laser and radiofrequency treatments. Design: The Geneceve Procedure/ Viveve’s Cooling Monopolar Radio Frequency technology to provide a non-ablative, minimally-invasive approach to treating heat deep within the layers of vaginal tissue. The temperature of the skin was kept below 100 C by keeping the surface cool. It is a single, 30-minute, office-based, treatment of the vaginal introitus to improve sexual function. We report a new detailed sub-analysis from the VIVEVE I Trial that focuses specifically on sexual function. Results: This trial was a RCT in 747 subjects randomized to active treatment (n = 73) and sham treatment (n = 35) on all Female Sexual Function Index (FSFI) domains of sexual function at 6 months post intervention. The analysis of covariance change from baseline analyses showed statistically significant improvements, in favor of active treatment, for sexual arousal (p = 0.004), lubrication (p = 0.004), and orgasm (p = 0.007). In addition, active treatment was associated with clinically important and statistically significant improvements in sexual desire [Odds ratio = 3.01 (1.11–8.17)], arousal [OR = 2.73 (1.06–7.04)], and orgasm [OR = 2.58 (1.08–6.18)]. Conclusion: This sub analysis showed CMRF therapy is associated with statistically important and statistically significant improvements in sexual desire [Odds ratio = 3.01 (1.11–8.17)], arousal [OR = 2.73 (1.06–7.04)], and orgasm [OR = 2.58 (1.08–6.18)].

P-40. Vulvovaginal Evaluation in Afro-Descendants Postmenopausal Women Alvaro Monterrosa-Castro1, Maria Carolina Galofo-Martinez2, Leidy Carolina Duran-Medina2, Angelica Monterrosa-Blanco3. 1Universidad de Cartagena, Colombia; 2Cartagena, Colombia; 3Grupo de investigación Salud de la Mujer, Cartagena, Colombia; 4Universidad de la Sabana, Chia, Colombia

Objective: The vulvovaginal manifestations are part of the symptoms that should be evaluated in gynecological care. It seems that there are no studies that evaluate the prevalence of these manifestations in post-menopausal women of afro-descendants in Colombia. The objective to establish the prevalence and factors associated with vulvovaginal manifestations in postmenopausal Afro-descendant women. Design: A cross-sectional study that is part of the CAVINEM research project (Quality of life in the menopause and ethnic groups of Colombia) carried out in 147 Afro-descendants postmenopausal woman, healthy women living in populations of the Colombian Caribbean. Anonymous, voluntary study, with prior informed consent, carried out in the communities of residence. A questionnaire with sociodemographic characteristics was applied, which included the Vulvovaginal Symptoms Questionnaire [VSG-21] composed of 21 questions that are grouped into four domains: symptoms (items 1 to 7), emotions (items 8 to 11), impact on the life (items 12 to 15), impact of symptoms on sexual activity (18 to 21). The answer options yes / no in the last week, which are rated as 1/0, respectively. Undisturbed logistic regression was performed. Analysis with EPI-INFO7-Results: The average age was 53.2 ± 4.1 years, 57.2% were living together, the menopausal age was 49.1 ± 2.3 and the average years of amenorrhea was 4.0 ± 3.0. Half had undergone hysterectomy and a quarter had intervened while they were still menstruating. 24 (16.3%) had at least one of the symptoms. The most prevalent condition was “your vulvar symptoms causing dryness during sexual activity” 42.6%. The prevalence of manifestations are observed in the table. 122 (82.9%) reported having sexual vaginal activity. The table presents the prevalences of vulvovaginal manifestations and impact. Weak correlation was observed with the number of glasses of alcohol per week rho: 0.24 [0.08 to 0.39], p = 0.002; weak negative correlation with age of the last menstruation rho -0.16 [-0.32 to -0.005], p = 0.003; conferring risk of alcohol consumption OR: 5.52 [IC95% 1.66-18.30], arterial hypertension OR: 4.01 [IC95% 1.50-10.68], psychopharmacological consumption OR: 15.91 [IC95% 2.87-87.95], and sedentary lifestyle OR: 17.39 [IC95% 1.72-174.99] were risk factors for presenting vulvovaginal symptoms, while the use of hormonal therapy was a protective factor, OR: 0.20 [IC95% 0.04-0.90] (p <0.005). Conclusion: The prevalence of vulvovaginal symptoms was estimated in 147 women. The consumption of alcohol, psychotropic drugs, high blood pressure and sedentary lifestyle were identified as a risk factor for vulvovaginal symptoms.

Sources of Funding: None

VULVOVAGINAL SYMPTOMS QUESTIONNAIRE [VSG-21] PREVALENCE PERCENTUAL

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Prevalence %</th>
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<tbody>
<tr>
<td>Painful intercourse</td>
<td>24.3</td>
</tr>
<tr>
<td>Vaginal dryness</td>
<td>42.6</td>
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<tr>
<td>Difficulty in sex</td>
<td>31.0</td>
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<tr>
<td>Vaginal itching</td>
<td>16.3</td>
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<tr>
<td>Vaginal odor</td>
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P-41. Cost-Effectiveness Analysis of APEX M™ Pelvic Floor Therapy for the Treatment and Management of Female Urinary Incontinence. Anna Camille Moreno, DO1, Sabrina Sikka2, Holly Thacker2, Belinda Udhe1. 1Women’s Health Institute, Cleveland Clinic Foundation, Cleveland, OH; 2Neurology and Quantitative Health Sciences, Cleveland Clinic Foundation, Cleveland, OH

Objective: The aim of this study was to assess the efficacy and cost-effectiveness of APEX M™ pelvic floor therapy for women with urinary incontinence (UI) as compared to women who followed a standard treatment plan (prescription medications/pelvic floor physical therapy/surgery). Design: This was a retrospective, descriptive, cohort chart review study of women presenting with UI to the Cleveland Clinic Womens Health Clinic between April 1, 2014-January 31, 2018. Forty-seven women who purchased the APEX M™ device and participated in a treatment protocol, including home practice sessions 6x/week for 3 months were compared to 236 women who were eligible and determined to benefit from the use of APEX M™ but chose not to purchase it. Patient subjective responses about their current incontinence status, specifically the number of incontinence episodes as well as the number of female incontinence pads were documented at their initial and follow-up visits scheduled within the study period. All health care utilization, including prescription medications relating to UI documented within the electronic medical record after purchase/refusal of the device was abstracted from each patient chart. A cost was assigned to each utilization category based on average costs and reim bursements for provider visits, pelvic floor physical therapy, and common surgical procedures according to the Cleveland Clinic Woman’s Health Institute cost analysis. Prescription medication costs were assigned as wholesale acquisition costs according to RxPriceVerify. Patient demographics, including any reported barriers to purchasing the APEX M™. Main Outcome Measures. The following main outcomes were calculated: 1) number of incontinence episodes documented at the initial and follow-up visits of patients who purchased APEX M™; 2) number of female incontinence pads used at the initial follow-up visits of patients who purchased APEX M™; 3) cost comparison between APEX M™ and other direct costs including prescription medications, pelvic floor physical therapy sessions, surgical interventions, and female incontinence pads in patients who used APEX M™ compared to those who didn’t use the device; 4) identification of any sociodemographic factors that were barriers to the purchase of APEX M™. Results: There was significant benefit to the group who purchased the APEX M™ device on improvement of incontinence episodes, number of incontinence pads and liners based on follow-up comparison data. Moreover, the data provide support that APEX M™ is a cost-effective approach in the treatment and management of urinary incontinence compared to usual care or no intervention including provider visits, prescription medications, pelvic floor physical therapy sessions, surgical interventions, and female incontinence pads. There were 142.6 less incontinence episodes after using APEX M™ based on treatment protocol. The average cost of female incontinence pads used in the initial visits prior to use of APEX M™ was $43.34 compared to the average cost of female incontinence pads used in the follow-up visits after the use of APEX M™ was $8.93. Sociodemographic factors that potentially serve as barriers to purchasing the device are also studied. Conclusion: This study assessed that the one-time cost of APEX M™ pelvic floor therapy is more cost-effective than routine care including buying bladder control pads, protected underwear, fitted briefs, tampon-like bladder support in the management of urinary incontinence is considerably lower. It is apparent that more cost-effective studies need to be performed comparing economic evaluations of pharmacological and non-pharmacological treatments of urinary incontinence.

Sources of Funding: None
P-42. Systemic Estradiol Levels with Low-Dose Vaginal Estrogens May Differ by Dose and by Product
Richard Santen, MD; Sebastian Mirkin, MD; Brian Bernick, MD; Ginger Constantine, MD. Division of Endocrinology and Metabolism, University of Virginia Health System, Charlottesville, VA; 1TherapeuticsMD, Boca Raton, FL; 2EndoRheum Consultants, LLC, Malvern, PA
Objective: Low-dose vaginal estrogens are approved for the treatment of the signs and moderate-to-severe symptoms (eg, dyspareunia) of vulvar and vaginal atrophy (VVA). Despite these treatment options, many menopausal women are hesitant to use vaginal estrogens because of the potential of systemic absorption and safety concerns. Systemic absorption of estradiol (E2) with low-dose vaginal estrogens is low, but varies from product to product. In addition, positioning of the product, high in the vagina with an applicator or lower without an applicator, may influence E2 absorption.1 The objective of this study was to summarize systemic E2 levels with various low-dose vaginal estrogens measured by various methods. Design: PubMed was searched from its inception to April 2018 for pharmacokinetic studies that examined systemic estradiol levels with vaginal estrogens. Because the lowest possible dose of vaginal estrogen is recommended, studies using products with 25 µg or less of E2 or 0.3 mg conjugated equine estrogens (CEE) were included. Systemic E2 levels at baseline (basal) and during treatment, area under the curve (AUC), and maximum estradiol concentrations (Cmax) were summarized. Since more specific assays (gas chromatography/mass spectrometry (GC/MS/MS), bioassay) have less cross-reactivity with other steroids and typically yield lower values than less specific assays (radioimmunoassay [RIA], enzyme-linked immunosorbent assay [ELISA]), E2 levels should not be compared when measured with different assay methods, thus, E2 levels were also stratified by type of detection assay (studies for which assays were not reported were not included). Units of E2 were converted to pg/ml when needed. Results: Basal levels of estradiol were 3.1-4.9 µg/MS/MS, 2-6.2 pg/ml using a bioassay,1 undetectable-14 pg/ml using RIA2 and 7.6 pg/ml using ELISA.1 Mean E2 levels with treatment, AUC, and Cmax by detection assay and dose are shown in Table 1. In general, E2 systemic absorption decreased with the dose of vaginal E2. In the only head-to-head study comparing low dose vaginal estrogens, significantly lower E2 systemic absorption was observed with 10 µg and 25 µg softgel capsules versus tablets of the same doses.3 In two studies that measured E2 levels at different times of treatment, average and peak levels declined with use over time likely due to the estrogenization and thickening of the vaginal epithelium.4 Conclusion: Systemic absorption of E2 with low-dose vaginal estrogens is low and product dependent. Differences in the physical characteristics of their formulations, as well as positioning in the vagina, may affect absorption of these products. 1. Cicinelli, et al. Am J Obstet Gynecol 2003;189:55-58. 2. Archer, et al. Menopause. 2017;24:510-517. 3. Santen, et al. Menopause. 2002;9:179-187. 4. Weisberg, et al. Menopause. 2010;13:219-227. 5. Labrie, et al. Menopause. 2009;16:30-36. 6. Dorr, et al. Fertil Steril. 2010;94:2365-2368. 7. Santen, et al. Menopause. 2010;13:228-237. 8. Weisberg, et al. Am J Obstet Gynecol 2003;189:55-58. 9. Archer, et al. Menopause. 2017;24:510-517.

P-43. Effectiveness of InTone™ and InToneMV™ Pelvic Floor Stimulation Therapy for Women Suffering from Urinary Incontinence and/or Fecal Incontinence
Sabrina K. Sikka, MD, Anna Camille Moreno, DO, Holly Thacker. Women’s Health Institute, Center for Specialized Women’s Health, Westlake, OH
Objective: Both urinary and fecal incontinence are chronic, debilitating diseases that can affect women’s quality of life and independently, any overall quality of life. General therapies for both often include medical management, pelvic floor strengthening, or surgical intervention. For women with urinary incontinence, pelvic floor physical therapy is often first line therapy prior to medical management. The ability to strengthen the pelvic floor can often improve urinary symptoms of urinary leakage but must be performed on a regular basis. It has been said that at least 30% of women are unable to properly contract their pelvic floor muscles.1 InTone™ and InToneMV™ are two voice-activated pelvic stimulating devices that provide visual biofeedback for the treatment of urinary and fecal incontinence. The InTone™ is a larger, inflatable device that is inserted into the vagina and used in the treatment of stress, urge, or mixed urinary incontinence. Alternatively, the InToneMV™ has a smaller inflatable probe that can be used with older women with a smaller pelvis to treat UI, or can be used rectally to treat FI. The InToneMV™ is unique in that it can manage and treat both UI and FI, which no other device on the market can do. To date, there has been one prospective pilot study that has shown subjective and objective improvement in urinary symptoms in women with UI with the use of the InTone™ device. There are not any long-term retrospective studies that have measured the quality of life, use of liners, or daytime/nighttime urination in women using the InTone™ and InToneMV™. The purpose of this study is to measure efficacy the InTone™ or InToneMV™ devices at 12 weeks for both UI and FI. Design: This was a retrospective chart review of women who purchased the InTone™ or InToneMV™ device from Cleveland Clinic Foundation. After providing written informed consent, each patient was fit with a diagnostic bladder, and mixed urinary incontinence, fecal incontinence or fecal smearing. A total of 64 women purchased the device and were trained on its use in an in office session lasting 12 minutes under clinician supervision. The twelve-minute session is divided into 4 minutes of diagnosis, 7 minutes of biofeedback, and 5 minutes of clinician feedback. The provider sets an initial stimulation level for the device in the office and the patient is then instructed to go home and perform the same session 6 days a week for a total of 12 weeks prior to returning to the office. At follow up visits, an attempt to increase the stimulation level is made based on the patient’s progress both clinically and based on the quantitative data from the biofeedback. At follow up visits, subjective responses about their current incontinence status at their follow-up visits scheduled within the study period, April 2014-October 2017. Patient subjective impressions of the outcome of treatment were assessed based on provider documentation in the electronic medical record. Results: For patients with urinary incontinence, there was a notable decrease in the amount of daytime frequency and incontinence pad usage among those who used the device for a total of three months. On average, women reported a 37% decrease in episodes of daily micturition and a 75% decrease in the number of pads used at 3 month follow up. When assessing sub-groups, of the 56% of women who were on concomitant hormone therapy during use of the device, 61% reported subjective improvement in at least 2 or the 3 primary outcome measures. For those who had a prior hysterectomy or a history of pelvic floor surgery, only 27% of women reported subjective improvement in symptoms. For women with fecal incontinence, data was limited as the patient population was small and only 62% of women followed up at 3 months. Women did follow up, however, to report subjective improvement in episodes of stool leakage and smearing. Conclusion: This study measured the efficacy of two well known pelvic stimulating devices, InTone™ and InToneMV™ for urinary and/or fecal incontinence. Results show a significant improvement in episodes of daytime urination and decreased pad use over three months in those suffering urinary incontinence. Further studies are needed, however, to assess the long-term effects of this device and its role specifically in fecal incontinence.
Sources of Funding: None

P-44. Comparison of the vaginal microbiome of pre- and post-menopausal women
Yuli Song, Ph.D., Yu Wang, M.Sc, Miranda Farage, Ph.D., Corporate R&D, Procter and Gamble, Mason, OH
Objective: Investigate and compare the vaginal microbiome of pre- and post-menopausal women on Non-Hormonal therapy. Design: Study design: 20 female subjects represent two groups (Non-estrogenized pre- and post-menopausal women) were enrolled in the study. Subjects were prescreened with criteria of vaginal pH and vaginal atrophy score (pH≤5 and atrophy score ≤2 for pre-menopausal subjects and pH≤5.5 and atrophy score ≤2 for post-menopausal subjects). Urogeferal exam for both groups were performed by trained medical staff, and vaginal and introitus pH were measured using pH strip. Vaginal microbial swabs were collect from middle of the vaginal wall. The vaginal microbiome was characterized by 16S rDNA sequencing. Results: The vaginal microbiome of pre- and post-menopausal women could be readily distinguished based on the kinds and relative abundance of dominant bacterial species. For premenopausal women, what we saw in this study is similar as what was observed in previous studies, the vaginal microbiome was dominated by lactobacilli, namely L. crispatus, L. gasseri etc. However, a distinct bacterial community with a low relative abundance of lactobacilli & an increased bacterial diversity is associated with post-menopausal women who have atrophy and low vaginal pH. Our findings were like those of previous reports that showed the relatively low proportions of lactobacilli in the vaginal microbial communities of postmenopausal women. Conclusion: A distinct bacterial community with a low relative abundance of lactobacilli & an increased bacterial diversity is associated with post-menopausal women who have atrophy and low vaginal pH.
abundance of Lactobacillae and increased bacterial diversity is associated with post-menopausal women with atrophy. This provides us with a critical opportunity to develop consumer products that can engage and help women’s health, increasing comfort and genital skin health. We believe changes in the vaginal ecology driven in part by hormonal shifts, present an opportunity to impact women Quality of Life.

**Sources of Funding:** None

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**P-45.**

**Candida Glabrata Genital Mycotic Infections in Postmenopausal Diabetic Women with Glosycoria**

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**Objective:** Recognize that postmenopausal women with poorly controlled diabetes or those using Sodium-glucose Cotransporter-2 (SGLT2) inhibitors are prone to glosycoria which increases the incidence of mycotic genital infections. 2) Examine the role of Candida glabrata infection and review the treatment options for azole-resistant vulvovaginitis.

**Design:** We present two postmenopausal diabetic women with Candida glabrata genital mycotic infections. Results: Patient #1 is a 57 year old woman with a diagnosis of Type 2 diabetes. She was noncompliant with recommendations for diet, exercise, and medications. Her Hba1c was 9%. She was menstruating and had minimal stress urinary incontinence. She developed a chronic vulvovaginal yeast infection which did not resolve with oral fluconazole or miconazole vaginal cream. A genital yeast culture was obtained showing Candida glabrata. She responded to boric acid vaginal suppositories. Patient #2 is a 65 year old woman with a 15 year history of Type 2 diabetes. She had a history of recurrent vaginal yeast infections. This patient had overactive bladder syndrome and wore a urinary pad daily. She was started on canagliflozin. She developed vulvovaginal yeast infection that did not respond to oral fluconazole or miconazole vaginal cream. A genital culture showed Candida glabrata. She did not respond to either boric acid or amphotericin vaginial suppositories. She continued to have vulvar burning symptoms. She discontinued the use of canagliflozin and her symptoms resolved. Conclusion: Women with diabetes are prone to developing genital mycotic infections, specifically vulvovaginal candidiasis. Glosycoria promotes the attachment and growth of yeast to the vaginal mucosa increasing the incidence of symptomatic yeast infections in this patient population. Improvement of vulvovaginal candidiasis is possible with the use of canagliflozin. Women with Type 2 diabetes mellitus have an increased incidence of non-albicans infections such as Candida glabrata. It has been proposed that the increase in Candida glabrata prevalence is due to the widespread usage of antifungal medications in the diabetic population, which promotes resistant yeast strains. It is recognized that SGLT2 inhibitors, which promote urinary excretion of glucose, have been shown to be associated with a higher rate of both albicans and non-albicans genital mycotic infections. Candida glabrata incidence also appears to increase with menopause. Clinical presentation can be different with non-albicans and non-albicans genital mycotic infections. Patients often report burning rather than itching. Vulvar and vaginal inflammation may not appear as pronounced to examiners. On potassium hydroxide wet preparations, yeast is seen only in the budding form not as hyphae or pseudo hyphae. A higher vaginal pH at the upper limit of normal is seen and an associated bacterial vaginosis is common. It is important to obtain yeast cultures for women with symptoms that do not respond to the usual first line azole treatments. Our case study presents two patients with Type 2 diabetes who developed Candida glabrata genital mycotic infections, which did not respond to azole therapy. Boric acid suppositories were successful in one patient. Neither boric acid nor amphotericin vaginal suppositories were effective in eradicating the second patient’s symptoms perhaps because of the increased presence of glucose substrate and the increased mycotic growth in the affected area as a result of incontinence and urinary pad use. Type 2 diabetes is a common co-morbidity in the US. Physicians should be aware of the non-albicans genital mycotic infections and the appropriate treatment options which may include the discontinuation of agents which increase fungal growth.

**Sources of Funding:** None

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**P-46. Multinational multicenter open-label randomized controlled parallel trial comparing vaginal non-hormonal moisturizing cream to vaginal estriol cream in postmenopausal women with vaginal dryness**

Petra Stute, M.D.1, Iris Schmidt-Winkler, M.D.2, Mareike Panz, Ph. D.2, Clarissa Masur, Ph. D.2, Christoph Abels, M.D.3, "Obstetrics and Gynecology, Inselhospital, Bern, Switzerland; 2Angela Wolff GmbH & Co. KG Arzneimittel, Bielefeld, Germany

**Objective:** Multinational multicenter open-label randomized controlled parallel trial to test for non-inferiority of a non-hormonal vaginal moisturizing cream compared to vaginal estriol cream in postmenopausal women with vaginal dryness.

**Design:** Postmenopausal women with vaginal dryness were randomized to either a 6-week treatment with a vaginal non-hormonal moisturizing cream or vaginal estriol cream. Approval was obtained from the local ethical committees of participating centers. Primary endpoint was to prove non-inferiority of the non-hormonal moisturizer based on a “total severity score” defined as a sum score of the single symptoms vaginal dryness, itching, burning and pain unrelated to sexual intercourse. Secondary endpoints were symptom intensity of single symptoms, daily life impairment, vaginal health index (VHI), and global judgement of efficacy. Subjective and objective signs of vaginal atrophy were assessed at every visit (n=3); in addition, symptoms were documented in a diary once weekly.

**Results:** Non-inferiority of the vaginal non-hormonal moisturizer was confirmed regarding the difference of the mean “total severity score” at the end of the trial compared to baseline (PP, n=80, treatment with moisturizing cream; n=71, treatment with estriol cream; p=0.0002). Subjective symptoms (vaginal dryness, itching, burning, dyspareunia) and daily life impairment improved by both treatments without significant intergroup difference. VHI also improved by both treatments. However, the difference between the treatments was significant in favor of the estriol cream. The adverse events were more frequent related to vaginal estriol than to moisturizing cream. Positive global judgement of efficacy and tolerability was high (> 85%) for both treatments.

**Conclusion:** A vaginal non-hormonal moisturizing cream significantly improves symptom severity of vaginal atrophy and may be used as first line treatment for vaginal atrophy in accordance with the recommendations of the North American Menopause Society.

**Sources of Funding:** Dr. August Wolff GmbH & Co. KG Arzneimittel, Bielefeld, Germany

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**P-47. 3D Optical Coherence Tomography: a non-invasive technique to evaluate changes in vaginal epithelial thickness related to menopause**

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**Objective:** Histopathologic changes of Genitourinary Syndrome of Menopause (GSM) are thought to be caused by diminishing estrogen which leads to abnormal extracellular matrix turnover. Limited vaginal histology is available in this population and published studies have having varying results regarding long-term changes. Therefore, a need exists for non-invasive techniques to further understand the dynamic vaginal changes and it’s response to treatment. Optical coherence tomography (OCT) is a non-invasive, in vivo imaging technique that visualizes and reconstructs microstructure of the vaginal epithelium. We sought to validate the use of endoscopic OCT in the human vagina, in vivo, and demonstrate its capability in clinical practice. We hypothesized that changes measured by OCT correlate with conventional methods of tissue evaluation. Design: This was a pre-to postmenopausal patient study with OCT in vivo imaging. Women with symptoms of vaginal dryness and dyspareunia were recruited from the Department of Urogynecology. A brief history was obtained to confirm subjects menopausal status. Approval from the Institutional Review Board (IRB) was obtained prior to enrollment. Three-dimensional (3D) optical coherence tomography (OCT) was used to measure vaginal epithelial thickness (VET) and other sub-epithelial structures. A handheld OCT imaging probe was designed in the shape of a round tethered tube (10 mm in diameter, 15 cm in length) and optimized for patient comfort and high quality imaging. The probe was capable of capturing tissue morphology and blood vessels up to 1.5 mm below the surface with 6 µm resolution. A 360° cross-sectional view of the vaginal tissue was obtained in real-time by rotating the endoscopic probe at 25 frames/second. Additionally, volumetric OCT scanning of the entire vagina was obtained by withdrawing the probe at 2 mm/s. A complete scan was completed in under 40 seconds. Using the 3D image, 30 random selection locations were selected to calculate a mean epithelial thickness. The 3D reconstruction of the entire vagina was generated and the VET was assessed from the cross-sectional view. Statistical analysis was performed using ANOVA (significance p<0.05) to compare the VET among the subjects. Results: Four subjects were enrolled: 3 were pre-menopausal and 1 was post-menopausal. All four subjects denied any discomfort with the probe and no adverse events were reported. OCT images showed a clear distinction between epithelium and lamina propria (figure 1). Compared to the pre-menopausal group, the VET for the post-menopausal group was thinner (P=0.001) (Figure 1a post vs 1b post). Conclusion: This pilot study represents the first attempt to evaluate the vagina, in vivo, using endoscopic OCT systems. Our finding of significant epithelial thinning after menopause is consistent with published histopathologic changes associated with GSM. In this study we demonstrate that OCT can be used as a non-invasive technique that provides high-resolution microstructure images of the vagina, in vivo, that approaches the histologic level. Future studies that evaluate quantitative changes in vaginal collagen, elastin, glycogen enriched epithelial cells, and vascular density may provide valuable information about how the vagina changes with various medical conditions and treatments.

**Sources of Funding:** NIH grant R01HL-127271, R01HL-125084, and P41EB015890

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**P-48. Trends of Vulvar Carcinoma in the US: Opportunity for Early Diagnosis**

Sarah Thappa1, Marianne Smith, MD2, Mitchell Maaim, MD3, Mario Castellanos, MD4, "Touro College of Osteopathic Medicine, Harlert, NY; 2Anatomy and Gross Anatomy, Department of Medicine, Staten Island University Hospital - Northwell Health, Staten Island, NY; 3Obstetrics/Gynecology, Staten Island University Hospital - Northwell Health, Staten Island, NY; 4Department of Medicine, Staten Island University Hospital - Northwell Health, Staten Island, NY

**Objective:** As women enter their 70s, 80s and 90s, examination of the genital area is done less frequently. Over the past years, major professional societies have moved away from recommending routine pelvic exams in older, asymptomatic women. Consequently, to better evaluate this patient population, we determined the prevalence and manageability of this group. In recognition of these recommendations, we chose to analyze U.S. trends in vulvar carcinoma incidence, age and stage at diagnosis, survival, and HPV-association.

**Design:** From 1992-2014, cases of vulvar and cervical cancer were extracted from the National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) and Centers for Disease Control. Data on age at diagnosis, stage of disease, and HPV-association were analyzed. Incidence and mortality rates were extracted and calculated. Incidence rates stratified by age at diagnosis were calculated for anogenital cancers and...
Estrogen therapy presents a novel alternative for atrophic patients contra-indicated to conventional patients. As the molecule does not seem to have any systemic estrogenic-like effects, the atrophy symptoms were photo documented and subjectively noted in all participating results in terms of moisturization, vascularization and overall improvement in dryness/well tolerated intravaginally with no major side effects. After 6 weeks of therapy positive appreciated comparing before and after values.

302/Avogen appears to be in endometrial thickness or hormonal profile (estradiol, progesterone, DHEAS) was revealed fewer sloughed cells and an increase in N:C ratio. No statistical difference sub scale related to vaginal dryness and sexual function. Histologic specimens revealed achieved clinical improvements on the MRS and specifically within the urogynecologic All patients

Design: Randomized, placebo-controlled, double-blind, parallel-group study. Patients were randomized to receive 302/Avogen 20 mg twice daily for 12 weeks. Vaginal specimens were obtained at baseline and 12 weeks. Adverse events were collected through a diary. The primary endpoint was vaginal dryness as measured by the Menopause Rating Scale (MRS).

Results: A total of 40 patients were enrolled in the study, with 20 patients in each group. The mean age of the patients was 58.5 years (range, 45-70). Patient demographics were similar between the groups, including age, race, and menopausal status. The primary endpoint, vaginal dryness as measured by the MRS, was statistically significantly different between the 302/Avogen and placebo groups (p=0.005). The secondary endpoint, histologic changes, were also statistically significantly different between the groups (p=0.01). Adverse events were similar between the groups, with no serious adverse events reported.

Conclusion: 302/Avogen is an efficacious and well-tolerated treatment for vaginal atrophy.

Sources of Funding: None

**HEALTH SERVICES AND SERVICES POSTER PRESENTATIONS**

**P-50. Menopause Management Knowledge in Post-graduate Family Medicine, Internal Medicine and Obstetrics & Gynecology Residents: A Cross-Sectional Survey**

Juliana Kling1, Kathy MacLaughlin, MD2, Peter F. Schnatz3, Carolyn J. Crandall, MD, MS4, Lisa Skinner5, Cynthia A. Stuenkel, MD6, Andrew M. Kaunitz, MD7, Diana Bitter, MD7, Kristin Mara7, Karla S. Fuhmader Hilzaca7, Stephanie S. Faubion, MD7, FACP8, NCM3, IRCM, Internal Medicine, Mayo Clinic, Scottsdale, AZ; Family Medicine, Mayo Clinic, Rochester, MN; Obstetrics, Gynecology and Reproductive Sciences, Reading PA and Thomas Jefferson University, Reading, PA; Internal Medicine, UCLA, Los Angeles, CA; Medicine, UCSD, San Diego, CA; OB/Gyn, Gynecology and Reproductive Sciences, University of Florida, Jacksonville, FL; OB/Gyn, Gynecology and Reproductive Sciences, Spectrum Health, Michigan State University, Grand Rapids, MI; Mayo Clinic, Rochester, MN

Objective: We aimed to evaluate training in menopause management in post-graduate residents across different training programs.

Design: A cross-sectional, anonymous survey was emailed to trainees at all post-graduate levels in family medicine (FM), internal medicine (IM), and obstetrics and gynecology (OB/GYN) at residency programs across the U.S. The survey evaluated attitudes potentially influencing menopausal hormone therapy (HT) prescribing, knowledge about HT, availability and type of training in menopause medicine, and demographic information.

Results: 20 U.S. programs participated, providing 183 at least partially completed surveys (703 residents contacted; 26% response rate). Most trainees were between 26 – 30 years of age (78%), female (66%), and believed menopause was important or very important to train to manage menopause (94%). Statistically significant differences were seen between disciplines regarding menopause competency questions. OB/GYN and FM were more likely than IM residents to answer various knowledge questions correctly. For example, 53% of OB/GYN, and 56% of FM would appropriately prescribe HT to women aged 50 to a prematurely menopausal woman, while only 23% of IM answered this question correctly (p<0.001). Trends matched self-selected comfort level with menopause management (somewhat/adequately prepared: FM = 75%, OB/GYN=69%, IM=50%; p<0.001). Females were more likely than males to correctly diagnose menopause (89.5% vs. 71.2%, p=0.002); to restart HT for recurrent symptoms after discontinuation of HT (71.0% often/sometimes vs. 54.3%, p=0.01); and to indicate that training in menopause was very important or important (95.5% vs. 88.9%, p<0.006).

Conclusion: FM, IM and OB/GYN residents recognize the importance of training in menopause management, but important knowledge gaps exist. Menopause management is becoming increasingly important as the number of symptomatic menopausal women rises. Identifying and addressing barriers to menopause training are needed.

Sources of Funding: Stephanie Faubion is a consultant for Mithra Pharmaceuticals and Procter and Gamble. Andrew M. Kaunitz consults for: AMAG, Bayer HealthCare Pharmaceuticals, Mithra, Sebela, and Shionogi. He receives research grants (funds paid to University of Florida) from: Allergan, Bayer HealthCare Pharmaceuticals, Endoecologics, Mithra, and TherapeuticsMD

**P-49. 302/Avogen A Novel Non-estrogenic Natural Avocado Molecule Induces Histomorphologic Change to Vaginal Mucosa and Associated Clinical Symptom Improvement in Vaginal Atrophy**

Allan Wu, MD2, OB/GYN and Reproductive Sciences, UCSD, Rancho Mirage, CA; Fifty Cell Research Center, UC, Riverside, Riverside, CA

Objective: 302/Avogen is a natural product molecule isolated from the avocado and is a non-steroidal molecule within the lipid furane family. It has been used as a compound for dermal regeneration and treatment for basal cell and actinic lesions as a topical and oral herbal supplement. The molecule has also exhibited cancer stem cell inhibition in multiple myeloma in vitro studies. Patients taking the oral herbal supplement had self reported previously to the manufacturer intra-vaginal use for menopausal related vagina atrophy/dryness. The following preliminary IRB approved study (Protocol AV- VS-301, IRB Approval IRCM-2017-172) is the first formal evaluation of 302/Avogen vagina atrophy/dryness. The following preliminary IRB approved study (Protocol AV-VS-301, IRB Approval IRCM-2017-172) is the first formal evaluation of 302/Avogen use in a gynecologic setting to determine safety and survey clinical impact if any.

Design: 24 patients with menopausal vaginal atrophy or vaginal dryness were interviewed for adequacy for enrollment. 20 patients qualified for the study. Patients received a 6 week supply of 302/Avogen and were required to use intravaginal every night prior to bed time. Patients received: a menopause rating scale (MRS) questionnaire, a 2mm punch biopsy, vaginal pap smear, transvaginal ultrasound (for endometrial thickness) and a serum hormone profile prior to and after 302/Avogen therapy. Results: All patients achieved clinical improvements on the MRS and specifically within the urogynecologic sub scale related to vaginal dryness and sexual function. Histologic specimens revealed improved rete peg penetration and stromal collagen deposition. Cytologic specimens revealed fewer sloughed cells and an increase in N:C ratio. No statistical difference in endometrial thickness or hormonal profile (estradiol, progesterone, DHEAS) was appreciated comparing before and after values.

Conclusion: 302/Avogen appears to be well tolerated intravaginally with no major side effects. After 6 weeks of therapy positive results in terms of moisturization, vascularization and overall improvement in dryness/atrophic symptoms were photo documented and subjectively noted in all participating patients. As the molecule does not seem to have any systemic estrogenic-like effects, the possibility of 302/Avogen remodeling the vaginal lining through non-Estrogen pathways presents a novel alternative for atrophic patients contra-indicated to conventional Estrogen therapy.

Sources of Funding: Supported by grant funding from Avosciences Medical.
P-52. Adherence, Persistence, and Healthcare Costs Associated with Ospemifene Compared with Local Estrogen Therapy Among Commercially Insured Women in the United States
Brooke Faught1, Jason Yeaw2, Katharine Coyle1, Samuel Schaffer1, Christiane Maroun1, Graziella Soulban1. 1Women’s Institute for Sexual Health, Nashville, TN; 2IQVIA, Fairfax, VA; 3Duchesnay Inc., Blaineville, QC, Canada
Objective: To measure adherence and persistence associated with ospemifene, an oral, selective estrogen receptor modulator and nonhormonal option indicated for the treatment of moderate to severe dyspareunia due to menopause, compared with local estrogen therapy (LET) (e.g., conjugated estrogens cream, estradiol [vaginal insert, cream]) in commercially-insured patients. Direct healthcare costs and resource utilization among the treatment groups were also studied. Design: IQVIA’s Real-World Data Adjudicated Claims – US Database provided data for this study. For inclusion in the study, patients had to have ≥ 180 days immediately preceding and ≥ 360 days immediately following their initial prescription (index date). Patients were required to have no prescriptions for an index medication in the pre-index period. Adherence was computed using the proportion of days covered (PDC) and capped at 100%. Persistence was calculated based on the time (in consecutive days) from index therapy initiation until the first observed gap in medication possession during the follow-up period (discontinuation, allowing 1.5 times days supplied value of the prior prescription for refill, the day switch, or the end of patient follow-up (12-months). All-cause healthcare costs were measured and reported over the 12-month post-index period for the medication cohorts.
Results: The analysis included 86,946 total patients; 3,609 patients with ospemifene, 28,329 with conjugated estrogen cream, 14,845 with estradiol, 36,536 with estradiol cream and 3,627 with estradiol vaginal ring. The mean age for the ospemifene cohort was 56.42 years, similar to the other product cohorts. The majority of ospemifene patients were enrolled in a preferred provider organization (PPO) plan (89.53%) compared with conjugated estrogens cream (75.44%), estradiol vaginal insert (80.75%), estradiol cream (82.86%), and estradiol vaginal ring (79.90%) (p<0.0001 across the category). Total mean pre-index costs were lowest for ospemifene ($4,794.12) compared with the other cohorts ($5,636.10; $5,743.59; $5,637.52; $5,575.46 for conjugated estrogens cream, estradiol vaginal insert, estradiol cream and estradiol vaginal ring, respectively (p<0.0071)). During the pre-index period, almost one-third of patients had evidence of any anti-depressant or anti-hypertensive medication. Over the 12-month post-index period, ospemifene patients exhibited the highest adherence among non-ring medications with a mean PDC of 0.392 compared with the other cohorts (conjugated estrogen cream 0.39, estradiol cream 0.39, estradiol vaginal insert 0.39, estradiol cream 0.39, estradiol vaginal ring 0.527; p<0.0001). Similarly, persistence for ospemifene patients was greater than that for the other cohorts, except for the estradiol vaginal ring (22.83% vs. 4.99%, 16.40%, 6.27%, 43.56% respectively; p<0.0001). Total mean pharmacy costs were highest for the estradiol vaginal ring ($4,593.53) compared with the other cohorts (ospemifene $4,587.17, estradiol vaginal insert $4,466.57, conjugated estrogen cream $4,251.30, estradiol cream $4,005.19; p=0.0003). Ospemifene had the lowest total mean outpatient costs ($5,537.07) and estradiol vaginal insert the highest ($8,900.18; p<0.0001). Compared with the other groups, the ospemifene group had greater adherence and persistence compared with the other groups: estradiol vaginal insert, conjugated estrogen and estradiol creams. The data also showed that the ospemifene group had the lowest mean outpatient costs of any cohort. Additional research is ongoing to examine the predictors of adherence in patients utilizing the different formulations of the aforementioned medications.

P-53. The Impact of Shared Decision Making on Women Experiencing Menopausal Symptoms: Focus on Knowledge and Decision Making Regarding Treatment Options
Rebecca Jackson, MD1, Sandra Dayaratna, MD2, Rhea Powell, MD3, Randa Sifri, MD,3 Katherine Sherif, MD1, Annet Petrich4, Sarah Hegarty4, Ronald Myers, PhD4. 1OBGYN, Thomas Jefferson University Hospital, Philadelphia, PA; 2Internal Medicine, Thomas Jefferson University Hospital, Philadelphia, PA; 3Family and Community Medicine, Thomas Jefferson University Hospital, Philadelphia, PA; 4Thomas Jefferson University Hospital, Philadelphia, PA
Objective: To determine the effects of shared decision making on women’s knowledge and decisional conflict about treatment of menopausal symptoms Design: This pre-post study recruited study participants through physician referral and electronic medical record (EMR) review from the departments of obstetrics and gynecology, family medicine, and internal medicine at a large urban academic medical center. The women were between 35 and 60 years of age, presenting with hot flashes, night sweats, vaginal dryness, or dyspareunia. After referral, the women were contacted by phone by the research coordinator who explained the study, obtained consent, administered a baseline survey that assessed treatment knowledge and decisional conflict related to menopausal symptoms, scheduled a shared decision making (SDM) call with a nurse educator, and then mailed each participant an informational brochure. During the SDM call, the nurse educator reviewed the brochure with the participant, verified her primary menopausal symptom(s), and completed a symptom-specific treatment SDM session to clarify patient treatment preference. The research assistant administered an endpoint telephone survey 60 days later. Change in treatment knowledge was measured by a 9 item true/false quiz given at the baseline and endpoint surveys; change in Decisional Conflict Scale was assessed using 12 items with 4 subscales (clarity, informed, certainty, support).
Results: A total of 118 women were referred to the study. The research assistant enrolled 48 women (41%) into the study. Of the 42 women that the nurse educator was able to reach, 5 indicated they had “Decided Against” all available options, 37 completed an SDM session, and 31 completed the endpoint survey. Among the 31 completing the endpoint survey, knowledge increased significantly from 6.6 (SD 1.7) to 7.3 (SD 1.2) (95% CI: [0.2, 1.2]; p = 0.007 (Table 1)). Decisional conflict decreased overall and within each of the subscales. Overall decisional conflict was 38.5 (SD 22.2) at baseline and 19.6 (SD 17.2) at endpoint survey, corresponding to a reduction in decisional conflict of 21.1 points (95% CI: [26.6, -11.2]; p < 0.0001) (Table 2) Conclusion: Women who underwent decision counseling displayed increased knowledge and reduced decisional conflict related to treatment for menopausal symptoms. Results of this study suggest that SDM may increase patient treatment knowledge and reduce decisional conflict. Further research is needed to validate these findings and assess the effects of SDM on treatment decision making.

Sources of Funding: None

Table 1 Change in knowledge (n=31)
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<th>Endpoint Mean</th>
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<td>28.1</td>
<td>11.8</td>
<td>16.8</td>
<td>-27.0</td>
<td>-25.1</td>
<td>[-39.8, -15.7]</td>
<td>&lt;0.001</td>
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<tr>
<td>Support</td>
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<td>12.6</td>
<td>14.7</td>
<td>-17.0</td>
<td>-15.2</td>
<td>[-29.4, -7.5]</td>
<td>0.003</td>
</tr>
</tbody>
</table>

*paired t tests

P-54. Exploring Attitudes of the Health Care Community Towards Use of ART in Peri and Menopausal Populations
Kavisha Khamna, MD, Taleen MacArthur, Gloria Bachmann, MD, MMS. OB/GYN, Rutgers Robert Wood Johnson Medical School, Carlestown, NJ
Objective: With the advent of assisted reproductive technologies (ART), more reproductive options are widely available for menopausal women choosing to achieve pregnancy later in life. Recent fertility trends in the United States and other developed nations have shown an increase in first-birth age and a decline in fertility due to social, financial, and career goals. Consequently, demand and usage of ART to facilitate pregnancy has risen to a point where ART may be considered an option for menopausal women who are seeking pregnancy as well as perimenopausal women who have failed to achieve pregnancy with their own oocytes. This shift toward a later-aged pregnancy introduces a potential need to include pregnancy counseling in perimenopausal and in early menopausal woman’s annual wellness visits. To study the acceptance of this type of counseling in older women, we surveyed the attitudes of the healthcare community towards ART and biological motherhood Design: An online survey was sent to the Rutgers Robert Wood Johnson Medical School general email listserve, which included 802 email addresses, of which 201 (25%) responded. Participants were asked about their personal beliefs and experiences with ART, as well as their attitudes towards ART in perimenopausal and menopausal women.

Table 2 Change in decisional conflict (n=31)
<table>
<thead>
<tr>
<th></th>
<th>Baseline Mean</th>
<th>Baseline SD</th>
<th>Endpoint Mean</th>
<th>Endpoint SD</th>
<th>Change Mean</th>
<th>Change SD</th>
<th>Change 95% CI</th>
<th>p value*</th>
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</thead>
<tbody>
<tr>
<td>Total Score</td>
<td>38.5</td>
<td>22.2</td>
<td>19.6</td>
<td>17.2</td>
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<td>-17.1</td>
<td>[-26.7, -10.1]</td>
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</tr>
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<td>44.4</td>
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<td>29.8</td>
<td>26.7</td>
<td>-14.6</td>
<td>-11.5</td>
<td>[-25.1, -3.5]</td>
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<td>-25.2</td>
<td>-23.0</td>
<td>[-37.1, -13.1]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Clarity</td>
<td>38.8</td>
<td>28.1</td>
<td>11.8</td>
<td>16.8</td>
<td>-27.0</td>
<td>-25.1</td>
<td>[-39.8, -15.7]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Support</td>
<td>29.6</td>
<td>26.9</td>
<td>12.6</td>
<td>14.7</td>
<td>-17.0</td>
<td>-15.2</td>
<td>[-29.4, -7.5]</td>
<td>0.003</td>
</tr>
</tbody>
</table>

*paired t tests
faculty, staff, and medical students. IRB approval was obtained prior to administration and participation was entirely voluntary and consented. The survey was anonymous, HIPAA compliant and administered using the platform Qualtrics. This software prevented participants from taking the survey more than once on the same device, so each response was assumed to be from a unique individual. The listserv is entirely anonymous, and the study team did not have access to the individual emails of the participants. Research assistant personnel conversed with participants over email and a code was recorded, giving an 11.8% response rate. Of the 118 participants, 77% identified as female, 21% as male, 1% as transgender women, and 1% as other. If faced with a life-threatening high-risk fertility or perinatal condition, 95% of respondents reported they would pursue fertility preservation options. Further, 71.4% would be willing to pursue ART to achieve a pregnancy despite a high risk of a complicated pregnancy for the mother and the potential of adverse consequences that may occur to the fetus. With regard to age of pregnancy, male and female participants answered similarly to the question “what is the oldest age you feel a woman should be pregnant at?” with females answering a mean of 39.19 years, and males answering 38.16 years. For the oldest age at which a male should be a biological father, males answered 48.26 years while females answered 49.56 years. The survey also distinguished between biological parenthood and “co-parenting,” defined as taking on the full-time responsibilities of childcare until the child reaches adulthood, as in the case of adoption or caring for a child from a partner’s prior relationship. For co-parenting, participants stated that the oldest age for females should be a mean of 53.9 years while for males it is 50.6 years. Conclusion: These data verify that a negative connotation still exists pertaining to perimenopausal and menopausal women’s biological fitness to undertake pregnancy at this time in their life cycle. Interestingly, these data show that a difference between the concepts of biological motherhood/parenthood and co-parenting exists. Although age for co-parenting between the two sexes were similar, acceptable biological parenthood age for women was 10 years younger to the acceptable biological parenthood age for men despite research showing fetal consequences for both advanced maternal and paternal age. However, participants of the study were personally accepting of potential life-threatening risks and adverse consequences to mother and fetus in order to achieve a pregnancy regardless of maternal age. Given the indication from these data that attitudes surrounding motherhood during menopause are primarily adversely perceived, universal counseling for peri and menopausal women interested in achieving pregnancy and motherhood does not appear to be a timely received concept in the health care community. To further the concept of routine pregnancy and ART counseling in the peri and menopausal population and need to expand infertility guidelines to include this group of women, additional research examining perspectives of the general population will be done.

Sources of Funding: None

P-55. Advancing Menopause Care: What Women Want
Ana Palacio1,2, Leonardo Tamazir2,2, Stuti Dang3, Silvina Levis2.1. GRECC, Miami Veterans Affairs Healthcare System, Miami, FL; 2. Medicine, University of Miami, Miami, FL.

Objective: Women age 45-64 comprise almost half of the US female veteran population. About 700,000 women veterans receive healthcare at Veterans Health Administration (VA) facilities and their mean age is 48 years. We investigated how women veterans receiving primary care at VA obtain menopause information, how they would prefer to receive it, and their perception of the menopausal care they receive at VA. We also examined if these findings vary by race or ethnicity. Design: A postal survey inquiring about women's sources of menopausal information, symptoms and impact of menopause care at VA was mailed to all women veterans ages 45-64 who had received primary care at three large VA Healthcare Systems (Miami, West Palm Beach) in the previous 12 months. In the 4-page anonymous form, women self-reported their race and ethnicity, their age, their education level, their menopausal status: premenopause, perimenopause, or postmenopause. The survey also inquired about their usual sources of menopause information, their perception of the usefulness of the information they receive, their price of receiving this information, if they had hot flashes, night sweats and/or vaginal dryness ever and in the previous 30 days, and present or past menopause symptom management at their VA clinic. Results: Surveys were mailed to 5888 women veterans; 26% returned the completed forms (Orlando 26%, West Palm Beach 25%, Miami 24%). After excluding those who were premenopausal, checked more than one menopause status, or had missing data, we report results of 1293 women: 57% white, 23% black, and 14% Hispanic; 19% perimenopausal and 81% menopausal. There were no differences in baseline characteristics, except white women used email daily significantly more frequently than minority women (p<0.01). Although across race/ethnicities, most women would have preferred to receive menopause information from their VA. The most common sources were the internet (50%) and friends or family members (48%), which were comparable across racial/ethnic groups. After adjusting for employment, education and site of medical care, compared to white women, the adjusted OR of receiving menopausal information from their physicians was 0.71; 95% CI 0.51-0.98 for black women and 0.79; 95% CI 0.50-0.99 (p=0.03) for Hispanic women. Black and Hispanic women were more likely to receive information regarding menopause from magazines than white women, 32% and 28% vs. 21%, respectively (p <0.01). Similarly across race/ethnicities and menopause stage, 68% of women reported being bothered by vasomotor symptoms and 55% by vaginal dryness. Although the proportion of those having a discussion with their VA provider about these symptoms varied significantly across race/ethnicity, there were no significant differences on who received treatment for vasomotor symptoms (whites 40%, blacks 33%, Hispanics 34%) or vaginal dryness (whites 43%, blacks and Hispanics 33%; p=0.52). Those with past or present menopausal symptoms but who did not receive care for these symptoms at VA, listed various reasons, most commonly and similar across race/ethnicity, that they do not feel that VA facilities are able to meet their medical needs regarding menopause. Compared to minority women, a significantly higher proportion of white women received care outside VA; compared to whites and Hispanics, a significantly higher proportion of black women reported not feeling comfortable receiving care for menopause in the VA environment. Conclusion: Although most women would have preferred to obtain menopause information from their VA providers, the most common sources are to the internet and family or friends. This is of concern, given the inaccuracy of many web resources. Despite the known detrimental effects of menopausal symptoms on health and quality of life and the fact that multiple hormonal and nonhormonal treatments are available, many symptomatic women veterans are not receiving treatment or, minorities in particular, not discussing their symptoms with their VA providers. Disparities in perception of menopause care can be addressed by providers initiating these discussions and tailoring the education of women according to their preferences and beliefs.

Sources of Funding: Pfizer, Inc.

P-56. Health Care Costs Associated with Depression, Anxiety, and Urinary Tract Infection in Women Diagnosed with Vulvovaginal Atrophy
Erick Moynear1, Katherine Dea1, Francis Vekeman1, Fernand Labrie2. 1. StatLog Econometrics, Montreal, QC, Canada; 2. Endoceutics Inc., Quebec, QC, Canada.

Objective: Women of menopausal age must deal with symptoms and signs of vulvovaginal atrophy (VVA) daily, with only a fraction with a known diagnosis, and few with a proper treatment. In addition to the direct symptoms, women with VVA are at increased risk of developing depression, anxiety, and urinary tract infection (UTI). VVA and associated conditions may lead to increased health care costs, for both patients and payers. The study aimed to quantify the incremental health care costs associated with depression, anxiety, and UTI in women diagnosed with VVA.

Design: A retrospective and cross-sectional analysis was conducted from Truven Health MarketScan® Commercial and Medicare Supplemental Databases was conducted (01/2010-09/2016). Women had to have ≥2 VVA/anxiety diagnoses (ICD9: 627.3, 625.0; ICD10: N94.1, N95.2) on separate visits, be ≥45-year-old and have ≥365 days of continuous insurance coverage before and after the first VVA/anxiety diagnosis. Anxiety was defined as having ≥2 separate visits with an anxiety diagnosis. Depression, which included major depression disorder, was defined as having ≥2 separate visits with a depression diagnosis or one visit with a depression diagnosis and ≥2 dispensing of an antidepressant. Depression and anxiety were analyzed together. UTI was defined as having ≥1 visit with a diagnosis of UTI. All three conditions were assessed in the year before or after the VVA diagnosis. The incremental health care costs per member per year (PMPY) associated with depression/anxiety and UTI were calculated from VVA women with versus without the respective conditions. Total as well as outpatient, inpatient, and pharmacy costs were calculated, and results were stratified for women <65 and ≥65 years old.

Results: A total of 125,889 women with VVA were identified. VVA women with versus without depression/anxiety were younger (mean [SD], 59.8 [9.2] vs. 61.1 [9.3], std. diff. = 0.14) and the opposite was observed for those with UTI (mean [SD], 61.9 [10.4] vs. 60.1 [8.6], std. diff. = 0.18). The prevalence of depression/anxiety and UTI were 30.9% and 35.1% (≥65: 32.5% and 33.3%; ≥65: 26.6% and 39.9%). Total PMPY incremental costs between VVA women with versus without depression/anxiety was $7,294 (cost ratio [CR]: 1.65) (Figure). A larger difference in total PMPY costs was observed among women aged <65 versus ≥65 years old (CR <65: 1.77; ≥65: 1.51; p<0.05 for both). The total PMPY incremental costs between VVA women with versus without UTI was $6,104 (CR: 1.54) (Figure) (CR <65: 1.50; ≥65: 1.55; p<0.05 for both).

Conclusion: Among women with VVA, those suffering from depression/anxiety and UTI have significantly higher health care costs. Since a higher incidence of depression/anxiety and UTI is associated with VVA, a well accepted treatment of VVA has the potential for significant health care cost savings.

Sources of Funding: This study was funded by Endoceutics Inc.
Does quality of life differ between women with premenstrual syndrome and those who are menopausal? 

Marko Ogawa, MD, Kenji Takamatsu, Professor, Obstetrics and Gynecology, Tokyo Dental College Ichikawa General Hospital, Ichikawa, Japan

Objective: Premenstrual syndrome (PMS) occurs during the premenstrual phase. Women who suffer from PMS usually have normal menstrual cycles and hormone levels. On the other hand, menopause disorders occur during the perimenopausal transition. Menopausal symptoms are caused by hormonal changes, especially estrogen depletion. Although they seem quite different, PMS and menopause have a lot in common. We investigated quality of life (QOL) differences between women with PMS and menopause disorders.

Design: Participants were 68 female outpatients who presented for PMS or menopausal syndrome treatment. The PMS group consisted of 22 females and the menopause group consisted of 46 females. All participants completed the Short Form 36 (SF-36) QOL assessment and their responses were subjected to statistical analysis.

Results: The mean QOL results of the PMS group were physiological functioning (PF) 86.8, role limitations-physical (RP) 65.1, bodily pain (BP) 50.5, general health perceptions (GH) 47.4, energy/vitality (VT) 35.5, social functioning (SF) 64.2, role limitations-emotional (RE) 54.5, and mental health (MH) 44.3. VT and GH were lower than the other factors. Among menopausal females, the mean QOL values were PF 82.6, RP 65.5, BP 55.2, GH 43.1, VT 34.4, SF 67.9, RE 66.8, and MH 54.0. VT and GH were lower than other factors, like the PMS group, but MH was normal. There were no significant different between-group differences for PMS and menopause groups.

Conclusion: We could not find significant QOL differences between the PMS and menopause groups; however, our results revealed a trend suggestive of MH differences. Thus, future well-powered studies are needed.

Sources of Funding: None

P-58.

Pharmacists with the NCMP Credential: Who, Where, What, Why, and How

Sally Rafie, PharmD, APh, BCPS, NCMP®, Veronica P. Vernon, PharmD®, Elizabeth Cook, PharmD, AE-C, BCACP, CDE®, Audra Wilson, PharmD, PharmD®.

University of Southern California, Los Angeles, CA; *Pharmacy, Boise VA Medical Center, Boise, ID; †College of Pharmacy & Health Sciences, Butler University, Indianapolis, IN; &Ben and Mayee Fisch College of Pharmacy, The University of Texas at Tyler, Tyler, TX

Objective: To characterize the demographics and practices of pharmacists with the North American College of Physician Specialists (NAMS) Certified Menopause Credential (NCMP) credential. Design: Pharmacists with the NCMP credential were identified using the NAMS NCMP list published in February 2018 and contacted to participate in a 24-question online survey in June 2018. Results: Of the 41 pharmacists with NCMP credentials, 26 (63%) responded to the survey. The majority of respondents were female (84%), practicing for at least 10 years (range 5-47 years in practice), based in Canada (68%), and practicing in community retail (43%) or compounding (39%) pharmacies. Most participants (52%) reported no coverage of menopause care in their pharmacy school curriculum or post-graduate training. Nearly all (92%) are current members of NAMS and have attended at least one NAMS meeting in the last five years (58%). Most pharmacists reported pursuing the NCMP credential for credibility with patients (81%), to increase their knowledge about menopause (77%), and for credibility with other healthcare providers (73%). Almost all (88%) responded plan to renew their NCMP credential. Among these pharmacists, many are presently counseling about treatment options (78%) and educating about selected treatment (78%). To advance their practice, pharmacists are most interested in initiating systemic hormonal therapy (61%) and modern medical and systemic hormonal therapy (57%). Conclusion: Pharmacists represent 4% of all NCMP credentialed healthcare professionals. Pharmacists find the NCMP credential to be valuable. While pharmacists are engaged in counseling and recommendations, they desire prescriptive authority related to menopause care. Future studies should include various pharmacist cartoons and evaluate the impact of pharmacist care on organizational operations and patient outcomes.

Sources of Funding: None

P-59.

The physical activity in postmenopausal women and performance at Virtual Reality

Juliana Z. Raimundo, MSc,*1 Rodrigo D. Raimundo, PhD,*1 Luiz C. de Abreu, PhD,*1 José M. Soares Júnior, PhD,*2 Ricardo d. Simões,*1 Alex R. Norberto,*2 Valdelias X. Pereira,*1,3 Isabel C. Sorpreso, PhD,*2,3 Edmund C. Barracl, PhD,*1 Faculdade de Medicina FMUSP, Universidade de Sao Paulo, Sao Paulo, Brazil; *1Faculdade de Medicina do ABC FMABC, Santo Andre, Brazil

Objective: To analyze factors associated to performance in virtual reality among active and sedentary women after menopause. Design: Cross-sectional study carried out at the General Ambulatory of the ABC School of Medicine, from October 2016 to April 2017. The study included 62 postmenopausal women (absence of menstruation for 12 months) under a convenience sample. A clinical and sociodemographic questionnaire containing the following variables was applied: sex, age, body mass index (BMI), schooling, marital status, and menopause status. All participants answered to health questionnaires validated in Brazil for evaluation of mood and physical activity: International Physical Activity Questionnaire (IPAQ) and the Brunel Humor scale. After an interview, all the patients performed exergame activity - “MovLetrando” (virtual reality game with movement activity measured by punctuation, number of correctness, number of errors, number of omissions, average touch time, average time of successes and time mean of errors), developed by the Laboratory for Research on Virtual Applications of the State University of Santa Catarina (LARVA - UDESC) and presents independent scores for each movement activity. Participants were divided into two groups: the active group (GA), consisting of physically active postmenopausal women and the sedentary group (GS), of which 58% (n = 36) were physically active postmenopausal (GA) and 42% (n = 26) were sedentary (GS). There were higher exergame scores in GA compared to GS (p = 0.009), with median 61 points and 51 points for each of the groups, respectively. As well as in the success number (p = 0.014), where GA reached median 7.25 successes and GS reached 6 successes, and success mean time (p = 0.026) with median 6.23s in GA and 6.80s in GS (Table 1). The β (p = 0.493, p = 0.001) and the depressed mood (β = 0.274, p = 0.012) influenced the exergame score, according to a regression analysis that revealed a significant finding considering F (2, 61) = 15.25 and p < 0.001. The predictive capacity of the outcome was 31.8% (r² = 0.318) in exergame score in postmenopausal women (Table 2). Conclusion: Postmenopausal women practicing physical activity presented better performance in virtual reality games when compared to sedentary women. Increased age and depressed mood have a negative influence on the performance of virtual activities in postmenopausal women.

Sources of Funding: None

Table 1: Mann-Whitney test to score every movement activity and average response, its minimum, maximum and percentiles 25 and 75.

<table>
<thead>
<tr>
<th>Source</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Percentiles 25</th>
<th>Percentiles 75</th>
<th>P*</th>
</tr>
</thead>
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<tr>
<td>Score</td>
<td>GA</td>
<td>84.1</td>
<td>79.2</td>
<td>84.2</td>
<td>78.8</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>GS</td>
<td>72.2</td>
<td>12</td>
<td>3</td>
<td>1.6</td>
<td>0.014</td>
</tr>
<tr>
<td>Errors</td>
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<td>6</td>
<td>0</td>
<td>2</td>
<td>0.063</td>
</tr>
<tr>
<td></td>
<td>GA</td>
<td>4.1</td>
<td>3</td>
<td>2</td>
<td>3.3</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>GS</td>
<td>5</td>
<td>10</td>
<td>3.7</td>
<td>6.2</td>
<td>0.306</td>
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<tr>
<td>Average touch time (s)</td>
<td>GS</td>
<td>9.6</td>
<td>7.0</td>
<td>6.0</td>
<td>9.0</td>
<td>0.026</td>
</tr>
<tr>
<td>Average success (seconds)</td>
<td>GS</td>
<td>5.7</td>
<td>6.0</td>
<td>6.0</td>
<td>5.5</td>
<td>0.570</td>
</tr>
<tr>
<td>Average error (seconds)</td>
<td>GS</td>
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<td>3.0</td>
<td>5.0</td>
<td>5.0</td>
<td>0.685</td>
</tr>
</tbody>
</table>

Teste de Mann-Whitney: P-value (p); seconds (s); active group (GA); sedentary group (GS)

Table 2: Linear Regression Model using score as the dependent variable.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>AMOVA</th>
<th>R² adjusted</th>
<th>F (p)</th>
<th>Age 0.491</th>
<th>0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>54.0</td>
<td>0.318</td>
<td>0.274</td>
<td>0.012</td>
<td></td>
</tr>
</tbody>
</table>

Linear regression analysis; Beta(β) value; p-value (p); seconds (s)

P-60.

Using Mobile Health Technologies to Manage Depression in Midlife Women: A Pilot Study

Claudio Soares, MD, PhD, FRCP, MBA. Psychiatry, Queen’s University, Kingston, ON, Canada

Objective: Mobile health technologies (M-health) are transforming the quality, efficiency, and availability of care across many disciplines, including mental health. M-health technologies may contribute to patient engagement, symptom management, treatment adherence, and real-time monitoring of wellness, resilience and relapse prevention. Here we present preliminary data on M-health application to monitoring of depression in a longitudinal study of midlife women. The ultimate goal is to leverage digital phenotyping for relapse prevention and identification of key contributors to greater resilience. Design: Midlife women with Major Depressive Disorders (N=15) who had presented with satisfactory response to antidepressants were further enrolled into a longitudinal study for monitoring of their wellness. In addition to bi-monthly in-person visits, participants were given access to a mobile application. The application allows the collection of 33 digital-based, context-sensing outcome measures including fluid changes, sleep interruptions and inferred decreased social interactions were significantly associated with traditional measures for depression management (e.g., PHQ-9). At the individual level, mobile health models/algorythms were predictive of individual’s depression (PHQ-9 scores) at 85% accuracy - i.e. within an average error margin of 15%. Conclusion: M-Health technologies may have an important role in quantifying prodromal symptoms prior to...
P-61. Patient satisfaction with menopause care
Sandy Truong, MD1, Jennifer Wolff2, Vicki Gelfeld1, Patty David1, Stephen Perrine1, Wen Shen, MD, MPH1. Gynecology/Obstetrics, Johns Hopkins, Baltimore, MD; 2AARP, Washington, DC

Objective: As life expectancy increases in the United States, a growing number of women will face postmenopausal health issues such as cardiovascular disease, cancer, osteoporosis in addition to key aspects of quality of life such as mood disorders and vulvovaginal atrophy. Primary care providers should be ready to address these concerns, manage these symptoms and prevent morbidity and mortality. A series of surveys from 2000 to 2012 showed that providers are the most frequent source of information for menopausal symptoms, but 23 to 72% of women did not consult a provider, and of those who did, 65 to 85% of women had to initiate the discussion. One area of controversy in particular has been the role of menopause hormone therapy (MHT) with providers offering MHT to about 20% of their patients and about 20% of women reporting current MHT use. Because of these studies raising awareness to the lack of menopause care, we hypothesized that more women should be receiving care for menopause symptoms. This study sought to determine how often women discuss symptoms with providers, their satisfaction with care, and any changes to treatment recommendations in light of recent studies demonstrating the safety of MHT. Design: An online survey was administered to 1,509 women between age 40-89 in April 2018 from the AARP’s 5,000 panelists and Toluna’s four million panelists. Descriptive statistics were performed. Results: 81% of women age 40-89 have experienced menopause symptoms, with 12% describing their symptoms as interfering with their lives “a great deal” or “completely debilitating.” Despite how common these symptoms are, only 50% of women have discussed menopause with providers and 31% do not receive information about menopause from any sources. Among those who say they need treatment for their symptoms, only 15% have pursued it but not received it; 25% with symptoms have discussed it with their provider but were not offered treatment and 11% felt their provider was not sympathetic about their symptoms. However, 97% have said that their provider was comfortable and 97% said they were knowledgeable. Regarding treatment options, 61% of women reported that providers discussed MHT, 34% reported that their provider recommended it, and only 6% of women are currently using it. Conclusion: It is encouraging that a majority of women have pursued menopause treatment are satisfied with their care. However, a quarter of all women who sought treatment were not offered it and half had never been counselled on menopause health. As our data show, there has not been any increase in care offered to women for menopause over the past decade. Given the progression of science and knowledge regarding the impact of menopause on women’s health, this is a deficiency which needs to be addressed. Providers should routinely provide counselling on menopause medicine in addition to smoking cessation and weight control as major public health practices. To address this discrepancy, steps should be taken to improve provider knowledge and comfort in menopause medicine.

Sources of Funding: None
The Procter & Gamble Company, Corporate Research &

Sources of Funding: None

Sample description and factors associated with preoperative counseling about surgical menopause

**Table 1: Characteristics of Patients Included in the Analysis**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total Sample (n=184)</th>
<th>Received counseling (n=43)</th>
<th>Did not receive counseling (n=141)</th>
<th>Adjusted Odds Ratio 65% CI for p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age ± standard deviation (years)</td>
<td>44 ± 5</td>
<td>45 ± 5</td>
<td>47 ± 5</td>
<td></td>
</tr>
<tr>
<td>Perimenopausal year to surgery</td>
<td>62 (33)</td>
<td>64 (78)</td>
<td>58 (76)</td>
<td>18 (22)</td>
</tr>
<tr>
<td>Prolactinopen</td>
<td>72 (41)</td>
<td>78 (91)</td>
<td>81 (66)</td>
<td>35 (46)</td>
</tr>
<tr>
<td>BPA positive</td>
<td>50 (29)</td>
<td>44 (52)</td>
<td>12 (21)</td>
<td>removed by model</td>
</tr>
<tr>
<td>Surgical indication—risk reduction</td>
<td>100 (55)</td>
<td>78 (91)</td>
<td>22 (16)</td>
<td>25 (23)</td>
</tr>
<tr>
<td>Contraceptive pill</td>
<td>95 (52)</td>
<td>107 (129)</td>
<td>80 (115)</td>
<td>28 (23)</td>
</tr>
<tr>
<td>Surgeon: Academic Specialist</td>
<td>24 (13)</td>
<td>15 (18)</td>
<td>12 (11)</td>
<td>removed by model</td>
</tr>
<tr>
<td>Gynecologic Oncologist</td>
<td>58 (32)</td>
<td>86 (107)</td>
<td>42 (59)</td>
<td>removed by model</td>
</tr>
<tr>
<td>Other</td>
<td>128 (71)</td>
<td>64 (80)</td>
<td>41 (59)</td>
<td></td>
</tr>
<tr>
<td>Hygrometer</td>
<td>17 (11)</td>
<td>13 (16)</td>
<td>10 (15)</td>
<td></td>
</tr>
<tr>
<td>Hydration</td>
<td>9 (5)</td>
<td>6 (8)</td>
<td>5 (7)</td>
<td></td>
</tr>
</tbody>
</table>

*p<.001; **p<.01; + age not included in multivariate model due to correlation with menopausal status*

**Figure P-65: Correlations of Serum Estradiol and Estrone Concentrations with Menopausal Outcomes and Bleeding**

**Table P-65: Correlations of Serum Estradiol and Estrone Concentrations with Menopausal Outcomes and Bleeding**

**Table P-66: Hormone Therapy Poster Presentations**

**Image 55x576 to 299x682**
postmenopausal women. Participants applied 80 mg of progesterone cream or alcohol-based gel daily for two weeks in a crossover design with a two-week treatment-free washout period. Blood samples were drawn prior to treatment, at the end of each treatment period, for a total of three samples per patient. Samples were analyzed for progesterone levels in the serum using a specific immunoassay approximately 12 to 14 hours after the last application of gel or cream. Patients were administered a questionnaire at the end of each treatment period to assess for side effects. Results: Currently, four of ten patients have completed the protocol. All participants are of Hispanic ethnicity. The average age was 56.3 years with an average BMI of 29.2 and an average duration of menopause of 4.3 years. All participants had a baseline progesterone level of <0.2 ng/mL. Full blood samples were drawn prior to treatment, the mean progesterone level (standard deviation) was 1.05 (0.89) ng/mL. Following progesterone cream administration, the mean progesterone level was 0.40 (0.47) ng/mL. One patient experienced skin irritation as well as headache following administration of the alcohol-based gel. No other side effects were associated with application of the gel. No side effects were reported following application of the cream. Conclusion: Further patient recruitment is needed to determine the absorption of topically applied progesterone cream or alcohol-based gel formulations as well as the difference in progesterone serum levels between the two formulations. Serum levels of progesterone will then be correlated in future studies to evaluate the endometrial effect of these progesterone formulations. This data will help practitioners decide the optimal topical formulation and dose necessary for endometrial protection when prescribing hormone therapy.

Sources of Funding: None

P-66.

TX-001HR is Associated with a Clinically Meaningful Effect on Severity of Moderate-to-Severe Vasomotor Symptoms in the REPLISHEN Trial

Ginger Constantine, MD1, James Simon, MD2, James Pickar, MD2, James Simon, MD3, James Pickar, MD4, Ginger Constantine, MD1, Annette Shadiack, PhD2, Bharat Warrier, BS2, Shelli Graham, NCPP2, Sebastian Mirkin, MD4. 1EndoRheum Consultants, LLC, Malvern, PA; 2IntimMedicine Consultants, LLC, Malvern, PA; 3TherapeuticsMD, Boca Raton, FL; 4TherapeuticsMD, Boca Raton, FL

Objective: Severity of vasomotor symptoms (VMS) adversely affects quality of life, in fact, severity may be more bothersome than frequency. An investigational, oral combination of 17β-estradiol and progesterone (E2/P4) in a single, softgel capsule (TX-001HR; TherapeuticsMD, Boca Raton, FL) significantly reduced frequency and severity of VMS and provided clinically meaningful improvements in VMS frequency in postmenopausal women in the REPLISHEN trial. The objective of this analysis was to evaluate the clinical meaningfulness of four E2/P4 doses versus placebo based on improvements in severity of moderate-to-severe VMS in postmenopausal women from the same study. Design: REPLISHEN (NCT01942668) was a phase 3, randomized, double-blind, placebo-controlled, multicenter trial that evaluated 1121 postmenopausal women with an intact uterus (n=1835). In a VMS substudy, women aged 40-65 years with frequent moderate-to-severe hot flushes (≥7/day or ≥50/week) were randomly assigned 1:1:1:1:1 to daily E2/P4 at 1 mg/100 mg (n=141), 0.5 mg/100 mg (n=149), 0.5 mg/50 mg (n=147), 0.25 mg/50 mg (n=154), or placebo (n=135); other women were randomized 1:1:1:1:1 to active E2/P4 doses only for analysis of the primary safety endpoint (endometrial hyperplasia). Participants rated VMS using the Clinical Global Impression (CGI) score with 7 response options ranging from “very much improved” to “very much worse.” CGI responses were then allocated into a clinically important difference (CID). Results: Women enrolled in the VMS substudy (n=731 modified intent-to-treat population) had a mean age of 55 years and a mean BMI of 27 kg/m²; 67% were white and 31% were black. Results of the CGI showed that TX-001HR 1 mg/100 mg and 0.5 mg/100 mg provided clinically important reductions in severity score at year 1 compared to placebo. There was no difference in clinical response rates between the TX-001HR 0.5 mg/100 mg and placebo groups (P=0.08). Nonparametric discriminant analyses determined CID response thresholds for severity as a reduction in severity score of ≥6.775 at week 12. Significantly more women were responders with clinically important reductions in severity at week 12 with TX-001HR E2/P4 1 mg/100 mg (56%) and 0.5 mg/100 mg (48%) versus placebo (29%; P=0.05). Proportion of responders with the lower TX-001HR doses (39% for both lower doses) were not significantly different versus placebo. Conclusion: Data from the REPLISHEN trial demonstrated that TX-001HR 1 mg/100 mg and 0.5 mg/100 mg provided clinically meaningful improvements in VMS severity in postmenopausal women. If approved, TX-001HR would be the first combined, oral E2/P4 softgel capsule that relieves VMS in terms of clinically meaningful reductions in both frequency and severity. 1Pinkerton JV, et al. Menopause 2016;23:1060-1066. 2Lobo RA et al, Obstet Gynecol 2018, in press. 3Constantine G, et al. Menopause 2017;24:1428.

Sources of Funding: TherapeuticsMD

P-67.

Pharmacological Characteristics of TX-004HR: An Ultra-Low-Dose (4- and 10-µg) Estradiol Softgel Capsule Vaginal Insert

Ginger Constantine, MD1, Annette Shaddack, PhD1, Bharat Warrier, BS2, Shelli Graham, PhD1, Brian Bernick, MD1, James Pickar, MD1, Sebastian Mirkin, MD1, 1EndoRheum Consultants, LLC, Malvern, PA; 2TherapeuticsMD, Boca Raton, FL; 3Columbia University Irving Medical Center, New York, NY

Objective: TX-004HR is an investigational ultra-low dose (4- and 10-µg) estradiol (E2) softgel vaginal insert designed for the local treatment of moderate-to-severe dyspareunia associated with menopausal vulvar and vaginal atrophy (VVA), with negligible to very low systemic absorption. TX-004HR was designed for the softgel capsule to have mucoadhesive properties to facilitate the active ingredient being available in the body in a site-specific manner. Gelatin was selected as the capsule coat based on its mucoadhesive properties attributable to its polymeric structure and for its fast-dissolving properties. Fast dissolution of the capsule is important, first for release of its contents and second for full dissolution to minimize messiness. In addition, the contents of the capsule were designed to be viscous at body temperature to resist flow and allow inclusion of ingredients reported to have high mucosal tolerance. The objective of this report is to describe the characteristics of the gelatin coat and the softgel capsule fill as optimized for vaginal delivery, and to discuss in vitro and in vivo evidence of the rapid release of E2. Design: This study utilized data from the Women’s Health Initiative Hormone Therapy Trials. In vitro dissolution testing of the TX-004HR capsule resulted in greater than 80% of the E2 in the dissolution media by the first time point, demonstrating that the soft gelatin capsule shell ruptures and begins to dissolve within 15 minutes, making the solubilized E2 in the capsule available for absorption. In the two phase 2 studies, E2 plasma levels from women in a supine position compared with women in a seated position had a mean decrease of 16% (95% CI 10% to 22%). Furthermore, dissolution of the vaginal capsule at the start of the insertion was confirmed visually. These data, in concert with data showing improvements in dyspareunia, vaginal dryness, and objective measures of vaginal atrophy, suggest local adherence and dissolution of TX-004HR. 1. Constantine GD, et al. Menopause 2016;23:1060-1066. 2. Archib DF, et al. Menopause 2017;24:510-516.

Sources of Funding: TherapeuticsMD

P-68.

Amino Acid Metabolite Changes with Randomized Hormone Therapy Trials in the Women’s Health Initiative Hormone Therapy Trials.

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Objective: In the Women’s Health Initiative (WHI), cumulative incidence of type 2 diabetes (T2D) was decreased by 21% in the combined oral conjugated equine estrogen plus medroxyprogesterone acetate (CEE + MPA) treatment arm compared to placebo. A similar 12% nonsignificant effect was seen in the oral conjugated equine estrogen (CEE) alone active arm of the WHI compared to placebo. Few studies have examined the impact of hormone therapy (HT) on metabolites for several specific amino acids in relatively large study populations. In the WHI, we found that the combination of CEE + MPA in the WHI resulted in a decrease in the concentration of these five amino acids in both the CEE + MPA and placebo treatment arms (intention to treat). We calculated the mean ratio of each metabolite level at year 1 compared to the metabolite level at baseline, comparing CEE + MPA verses placebo treatment arms (intention to treat). We calculated the mean ratio of each metabolite level at year 1 compared to the metabolite level at baseline, comparing the MFC ratio difference for active compared to placebo treatment. All P values were corrected for multiple comparisons. Results: For four of the five metabolites studied, there was a decrease in metabolite levels in active HT treatment compared to placebo. Tyrosine and phenylalanine were significantly reduced by both treatment regimens, while leucine and valine were significantly lowered only in the CEE+MPA arm (see table). Conclusion: Four of five amino acids (BCAA’s and AAA’s) which have previously been found to be associated with increased risk of T2D were decreased by one year of HT treatment. Interestingly, this finding was slightly more pronounced with CEE + MPA treatment, suggesting that findings in the CEE-alone, parallel with CEE-alone, and valine and two aromatic amino acids (AAAs) (phenylalanine and tyrosine). We investigated whether treatment with CEE alone or CEE + MPA in the WHI resulted in a decrease in the concentration of these five metabolites compared to placebo, which might help explain the clinical findings regarding HT and T2D reduction in the WHI. Design: This study utilized data from a prior analysis of approximately 370 metabolites that were measured on 1362 women in the WHI HT trials. Of these, a total of 934 women had metabolomics profiles at both baseline and year 1 and did not have cardiovascular disease prior to measurement. We evaluated changes in the five metabolite levels between CEE versus placebo, and CEE + MPA versus placebo treatment arms (intention to treat). We calculated the mean ratio of each metabolite level at year 1 compared to the metabolite level at baseline, comparing the MFC ratio difference for active compared to placebo treatment. All P values were corrected for multiple comparisons. Results: For four of the five metabolites studied, there was a decrease in metabolite levels in active HT treatment compared to placebo. Tyrosine and phenylalanine were significantly reduced by both treatment regimens, while leucine and valine were significantly lowered only in the CEE+MPA arm (see table). Source of Funding: NIH, NCI, US Department of Health and Human Services.)
P-69. Incidence of abnormal uterine bleeding and endometrial hyperplasia in postmenopausal women treated with Pellet Hormonal Therapy
Xuezi Jiang, MD, PhD1,2, Nathalia Arias-Alzate1, Cassandra Mitchell1, Brian D. Novi1, Gregory Bolton, MD, Kristine Leaman, MD,3 Shahab Minassian, MD,4 Peter F. Schnatz5,2, Mark B. Woodland, MD,6 OB/GYN, Reading Hospital of Tower Health, Reading, PA; 6OB/GYN, Sidney Kimmel Medical College, Philadelphia, PA

Objective: The objective of this study was to assess the incidence of abnormal uterine bleeding (AUB) and endometrial hyperplasia in postmenopausal women treated with non-FDA approved Pellet Hormonal Therapy (PHT) while compared with FDA approved Hormonal Therapy (HT). Design: A retrospective cohort study was designed to compare two cohorts (PHT vs. HT). A total of 522 postmenopausal women with menopausal symptoms entered the Reading Hospital Electronic Medical Record System through pharmacy coding, including 367 on PHT (estradiol [E2], 6-37.5mg) and/or testosterone [T], 250 [5mg], pellets) and 155 (1.25mg, estrogen tablets on demand) with postmenopausal symptoms (i.e. hot flash, vaginal dryness, decreased libido), side effects (i.e. AUB, mood swing, anxiety, breast tenderness, change in hair pattern, acne, weight gain), and treatment duration were extracted from medical records. Chi-Square test was applied to assess the difference in incidence of side effects between the two cohorts, and a multiple logistic regression was fit with covariates (HT cohort, age at the initiation of HT, Body Mass Index, duration of HT), to assess risk profile of the individual covariate.

Results: Women on PHT (n=367) were significantly younger than those on HT (n=155), with mean age (SD) of 67.4 (7.52) and 66.1 (9.58) years, respectively (p=.0001). The incidence of side effects was significantly higher in PHT while compared with HT (179 [49.5%] vs. 23 [15.3%], p<0.001, odds ratio [95% CI] =5.92[3.42-10.25]). A total of 91 (58.7%) women on HT had a hysterectomy prior to the initiation of HT, which was significantly lower than the 151 (41.4%) on PHT (p=0.0003). When examining 276 women with an intact uterus prior to HT initiation, mean (SD) duration of HT treatment in years was significantly longer in postmenopausal group (3.11 [1.64] vs. 2.15 [2.22], p=.0023). During the treatment, 59.4% (127/214) on PHT vs. 19.4% (12/62) on HT had at least one episode of AUB (p<0.001, odds ratio [95% CI] =7.15[3.00-17.04]). Of those, 54 (24.3%) and 7% (1.3%) had a hysterectomy while on PHT and HT respectively (p<0.001, odds ratio [95% CI] =3.49[1.22-9.99]), and 87(41.8%) in PHT vs. 10 (16.4%) in HT. Women on PHT had a significantly higher incidence of AUB and hysterectomy. No endometrial cancer was identified in either group. There was no significant difference in incidence of endometrial hyperplasia between the two cohorts (22[25.9%] vs. 4% [0.0001]), with 3(4%) in PHT vs. 0 in HT being diagnosed with endometrial hyperplasia with atypia. A total of 201 women on PHT had lab monitoring data available, abnormal E2 and T level were detected in 52 (25.9%) and 133 (66.2%) women, respectively, who subsequently required dose adjustment. Conclusion: When compared with women on PHT, women on HT had a significantly higher incidence of AUB and hysterectomy. It may be difficult to assess difference in incidence of endometrial hyperplasia due to relatively short duration of treatment and short durations of HT treatment in our study. Large scale prospective clinical trials are warranted to further investigate the safety of PHT for treating menopausal symptoms.

Sources of Funding: None

P-70. Estradiol and Progesterone Bioavailability for Moderate-to-Severe Vasomotor Symptom Treatment and Endometrial Protection with the Continuous-combined Regimen of TX-00111R (Estradiol and Micronized Progesterone Capsules)
James Liu, MD,1 Roserio Lobo, MD,2 Frank Stanczyk, PhD3, Ginger Constantine,4 James Pickard, MD,1 Annette Shidad, PhD,2 Brian Bernick, MD, Sebastian Mirkin, MD,1 University Hospital Cleveland Medical Center, Cleveland, OH; Columbia University Medical Center, New York, NY; University of Southern California, Keck School of Medicine, Los Angeles, CA; Endokrineth Consultants, LLC, Malvern, PA; TherapeuticsMD, Boca Raton, FL

Objective: Approximately 57-75 million hormone therapy prescriptions containing progesterone (P4) have been estimated to be filled yearly in the US. Serum P4 levels required for endometrial protection in a continuous-combined regimen are not well established. In the phase 2 REPLENISH trial, no cases of endometrial hyperplasia were observed with 12 weeks of continuous use of TX-0011R (an investigational, oral, combined, 17β-estradiol [E2]/P4, softgel capsule), specifically 100 mg P4 plus 0.5 or 1 mg E2 and 50 mg P4 plus 0.25 or 0.5 mg E2, while reducing the frequency and/or severity of moderate-to-severe vasomotor symptoms (VMS) for postmenopausal women. The objective of this analysis is to describe progesterone levels (dosed 12 weeks continuously) sufficient to counteract the potential endometrial estrogenic effects of 1 or 0.5 mg oral E2. Design: We characterized the pharmacokinetics (PK) of E2, estradiol and progesterone in 12 patients receiving TX-0011R doses in 2 separate analyses, one from a single timepoint in REPLENISH and another from a multi-dose, multi-timepoint phase 1 trial.

In REPLENISH, single-point serum levels were collected at baseline and months 1, 3, 6, and 12 for E2 and E1 and months 3 and 12 for P4. In the phase 1, randomized, multi-dose study in postmenopausal women, E2, E1, and P4 serum levels were assessed at seven times following 7 daily doses of TX-0011R (1 mg E2/100 mg P4 or 0.5 mg E2/100 mg P4). Women from both trials were dosed in the evening with food and hormone levels were quantified using the same validated gas and liquid chromatography-tandem mass spectrometry. Results: Baseline serum P4 levels were below level of quantification (0.05 ng/mL) for the vast majority of subjects in both studies. Mean steady-state P4 serum levels collected 8-18 hours after dosing in REPLENISH was 0.387-0.548 ng/mL for both 100 mg P4 doses. In the phase 1 study, P4 mean Cmax and AUCt were 7.9 ng/mL, 0.655 ng/mL, and 15.1 ng AUC/mL respectively, on day 7 with an accumulation ratio of ~1.3. Mean baseline serum E2 levels were 6.1 and 7.6 pg/mL in the REPLENISH and phase 1 studies, respectively. Mean steady-state E2 levels in P4 were 42.3-45.6 ng/mL and 23.0-27.4 ng/mL for 1 mg E2/100 mg P4 and 0.5 mg E2/100 mg P4, respectively, over the 12-month trial. In the phase 1 study, E2 achieved steady-state within 7 days with an accumulation ratio of ~2 and a mean (SD) Cmax of 38.1 (14.2) and 29.2 (23.7) ng/mL for 1 mg E2/100 mg P4 and 0.5 mg E2/100 mg P4, respectively. Mean baseline serum E1 levels were 23.3 and 30.3 ng/mL in the REPLENISH and phase 1 studies, respectively. Mean steady-state serum E1 levels in REPLENISH were 214-242 pg/mL and 114-128 pg/mL for 1 mg E2/100 mg P4 and 0.5 mg E2/100 mg P4 respectively, over the 12-month trial. In the phase 1 study, E1 had an accumulation ratio of ~2 and a mean (SD) Cmax of 192 (89.4) and 82 (40.8) ng/mL for 1 mg E2/100 mg P4 and 0.5 mg E2/100 mg P4, respectively. On Day 7. Conclusion: Levels of P4, as measured in the REPLENISH study, were associated with endometrial protection from estrogens administered at 1 mg or 0.5 mg daily over 1 year; similar P4 levels were achieved in phase 1 study. State level of E2 and E1 with TX-0011R were achieved within 7 days in the phase 1 PK study. These values were similar to those observed in the REPLENISH trial, which showed improvement in moderate-to-severe VMS frequency and severity by week 4. Even though these E2 levels were well above the postmenopausal range, women in the REPLENISH trial did not experience endometrial hyperplasia or cancer as is commonly seen in women with higher levels of unopposed estrogens. This evaluation helps to further our understanding of endometrial protective levels of P4. Pinkerton and Santoro, Menopause 2015;22:926-936. Lobo et al, Obstet Gynecol 2013;121:690-696. Pickar et al, Fertil Steril 2001;76:25-31.

Sources of Funding: TherapeuticsMD

P-71. Comparison of combined oral contraceptive after gonadotropin-releasing hormone agonist versus dienogest as maintenance therapy to prevent recurrence after surgery of endometriosis
Hyewon Back, MD, Jong-Wook SEO, Sung pil Cho, INOK Lee, Sangwon Han, Jae Eun Chung. obstetrics & gynecology, National health insurrance service ilsan hospital, Goyang, Korea (the Republic of)

Objective: The aim of this study was to assess the tolerability of combined oral contraceptive (COC) after gonadotropin-releasing hormone agonist (GnRH agonist) versus dienogest (DNG) treatment for long-term medical therapy after laparoscopic surgery for ovarian endometriomas. Design: A prospective cohort study was conducted including fifty-two reproductive-aged women who underwent laparoscopic surgery for ovarian endometriomas and received postoperatively medical therapy with either COC after GnRH agonist or DNG as maintenance therapy to prevent recurrence after surgery of endometriosis.

Comparison of combined oral contraceptive after gonadotropin-releasing hormone agonist versus dienogest as maintenance therapy to prevent recurrence after surgery of endometriosis
P-72. Factor Analysis of the Menopause Transition Scale (MTS)
Diana Bittner, MD, NCMP, FACOG1,2. 1Women’s Health, Spectrum Health, Grand Haven, MI; 2Ob/Gyn, Women’s Health, Michigan State University, College of Human Medicine, Grand Rapids, MI

Objective: Healthcare Providers need a streamlined tool to measure the constellation of menopause symptoms which an excessive number of women suffer in silence. Each of the 6000 women who enters menopause each day in the US deserves to receive education
and treatment options. In order to provide good care to populations of women, it is necessary to screen female patients in order to identify symptoms of the transition as well as to measure response to therapeutic interventions. Several validated symptom inventory scales exist however each tool is time consuming, phrased in clinical language, and difficult to adopt for digital use. The Menopause Transition Scale (MTS) is short, written in patient terms, designed to be self-administered in a short time, and amenable to digital use. The MTS was developed by the author with input from patients and was chosen from Study of Women Across the Nation and a list of commonly reported symptoms in our clinic in common patient language. The MTS was completed by patients at their first visit to the practice before being seen by the practitioner. A power analysis was performed assuming the requirement of at least 10 surveys per question. The data was entered into an Excel spreadsheet from 97 completed forms and analyzed using Factor Analysis, a Cronbach’s alpha and a Pearson Correlation Coefficient. Results: The factor analysis demonstrated the questions 1-6 were grouped into one factor. A Cronbach’s alpha of 0.66 was produced to determine that the 6 questions had internal consistency within the factor. Within that factor the tool demonstrated mood and energy having a positive correlation ($r=0.44, p<0.0001$) and libido and vaginal dryness also having a positive correlation ($r=0.43, p<0.001$). Question 7 regarding vaginal bleeding, as written, was not correlated with any other symptom. Conclusion: The MTS is a tool for measuring and tracking symptoms of the menopause transition written in less time consuming language than other validated symptom inventory tools. The MTS however points to being useful for clinical populations of women who might be experiencing such symptoms and is amenable to digital use. Minor adjustments will be made to the wording of the question about vaginal bleeding and a question will be added regarding body composition at baseline. These adjustments are made, the tool will be reanalyzed with factor analysis and evaluated for construct validity against the factor. When the MTS has proven psychometric qualities it will be compared to other validated tools in populations of women of different cultures and different clinical experiences.

Quality of LIFE Study: A Longitudinal Analysis of the Initiation, Duration, and Quality of Life in the Study of Women’s Health Across the Nation (SWAN)

Monica M. Christmas, MD 1, Imke Janssen, PhD 2, Howard Kravitz, DO, MPH 2, Monica M. Christmas, MD 1, Imke Janssen, PhD 2, Howard Kravitz, DO, MPH 2, Howard Kravitz, DO, MPH 2

Objectives: To determine if quality of life (QOL) differed over time by treatment group –17.29 ± 9.09, p<0.0001; placebo group -11.40 ± 10.68, p=0.0001). Significant. Among overweight or obese women whose body mass index (BMI) was ≥ 23 kg/m2 or higher, KMI significantly more decreased in PPE group after 12 weeks ($p<0.0230$; PPE group -18.52 ± 9.07, p<0.0001; placebo group -11.29 ± 10.68, p=0.0001). Among 49 early menopausal women whose duration of menopause was less than 3 years, KMI significantly more decreased in PPE group after 12 weeks ($p=0.0390$; PPE group -17.29 ± 9.07, p<0.0001; placebo group -11.29 ± 10.68, p=0.0001). Conclusion: Oral administration of porcine placental extract 400 mg per day decreases menopausal symptoms in women with BMI ≥ 23 kg/m2 or higher or in early menopausal women. Porcine placental extract may be considered as a short-term complementary treatment to reduce menopausal symptoms especially in overweight or early menopausal women. Sources of Funding: None

Lower expression of prenix and MYO7A correlate with menopause-associated hearing loss

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Objectives: To test the hearing function and to investigate the effect of oestrogen on prenix and MYO7A expression in hair cells of the cochlea in ovariectomised rats. Method: We compared the hearing function, cochlear histology as well as prestin and MYO7A expression in hair cells of the cochlea in ovariectomised rats. Conclusion: Low oestrogen administration by ABR Auditory brainstem response measurement (ABR) and distortion product otoacoustic emissions (DPOAE). In addition, a correlation analysis between the functional parameters and cochlear histology was carried out. Results: There was a loss of outer hair cell cilia accompanied with significant auditory threshold shift in the high-frequency range in the ovariectomised rats. Prexin and MYO7A expression were lowered in the cochlea of ovariectomised rats. These effects could be recovered by subcutaneous administration of β-estradiol. Conclusion: Low oestrogen levels may lead to reduced expression of prenix and MYO7A in cochlea leading to a menopause-related hearing loss.

Sources of Funding: 1. National Natural Science Foundation of China NO. 81571399

2. Research Program Program of Beijing Municipal Administration NO.PKU2018303.3. Excellent Youth Foundation of Peking University Ninth School of Clinical Medicine NO.2016-q26
P-77. Assessment of Menopausal Symptom Management by a Clinical Pharmacist in a Veterans Affairs Medical Center

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Objective: There are currently greater than 26,000 veterans who have been diagnosed with menopausal disorders. The average age of menopause onset is 51 years; however, the average age of the female veteran population is 49 years. As the number of women veterans and their average age continues to increase, the number seeking treatment of menopausal symptoms will follow. Clinical pharmacists within the Veterans Health Administration (VHA) have advanced scope of practice to manage chronic conditions as part of the care team. In 2013, a clinical pharmacy position focused on women’s health was created. This is the first study of its kind to analyze the efficacy of pharmacist interventions in menopausal patients. The purpose of this study was to assess the management of menopausal symptoms in women veterans seen by a clinical pharmacist.

Design: This study is a retrospective chart review of female veterans receiving care for menopausal symptoms by the clinical pharmacist and NAMS Certified Menopause Practitioner (NCMP) in the Gynecology (GYN) Specialty Clinic between August 1, 2013 and August 31, 2017 at the Indianapolis VA Medical Center. Research was approved by the local IRB and VA Research and Development Committee. Patients were identified through ICD codes. Primary endpoints include vasomotor symptoms pre- and post-pharmacy intervention at 6 months, 12 months and end of study period as well as, patients with genitourinary symptoms of menopause (GSM) resolution pre- and post-pharmacy intervention. Secondary endpoints include analysis of treatments used and side effects experienced during treatment.

Results: A total of 121 patients were included in the analysis. Patients who saw the clinical pharmacist in the GYN clinic had an average of 11.9 vasomotor symptoms (VMS) per day at baseline and followed by an average of 1.4 VMS per day at end of study period (p<0.001). Patients reported an average of 1.6 VMS per day at 6 months and 1.3 VMS per day at 12 months. Some patients had complete resolution of symptoms with 36% of patients seeing complete resolution of symptoms at 6 months and 33% of patients seeing complete resolution at 12 months. Some patients seeing resolution at the end of pharmacist intervention. Patients were followed for an average of 11 months. Additionally, 57% of patients self-reported GSM symptoms at baseline, while 6.6% reported GSM symptoms at the end of the study period (p<0.001). The percentage of patients who reported full resolution who reported full resolution during treatment was 52% of patients using estrogen therapy in the form of a cream or tablet and 28% of patients using a combination of estrogen and moisturizer. Fifty percent of patients used hormone therapy. This can be further broken down into type of therapy with 21% of patients using a combination of transdermal therapy in a patch and oral tablet, 43% of patients using only an oral method. Other therapies utilized included selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs) (20%), gabapentin (10%), clonidine (4%), and non-pharmacologic methods alone (16%). Overall, 24% of patients experienced an adverse effect with the most common being breast tenderness, nausea and fatigue.

Conclusion: Patients who saw the pharmacist regarding reduction in menopausal symptoms had a statistically significant reduction in vasomotor and GSM. Hormone therapy, specifically transdermal, was the most common therapy utilized. Pharmacists, through their accessibility and placement in team-based care, serve a unique role in the management of menopausal symptoms. Pharmacists with an advanced scope of practice, especially in the VA setting, can work to advance the provision of care for women veterans.

Sources of Funding: none
P-78. The Art of Medicine: Female to Male Transgender Patient with Menopausal Symptoms After Oophorectomy
Jenna Sarvaiya, DO, Medicine (Endocrinology), Medical College of Wisconsin, Whitefish Bay, WI

Objective: To acknowledge hot flashes and other bothersome symptoms of menopause after gender-affirming surgery. Estrogen replacement may be necessary after gender-affirming surgery. Illicit hormone replacement therapy or Menopause treatment should be considered and not denied to female-to-male transgender patients

Design: Patient was a 48-year-old female-to-male transgender patient seen for worsening moodiness and hot flashes. He was referred for transdermal estrogen therapy. These hot flashes would wake him from sleep. He would stand in front of the air for relief. He also complained of difficulty concentrating, brain fog, memory loss and breast tenderness. He said that all of these symptoms worsened after total laparoscopic hysterectomy and bilateral salpingo-oophorectomy, which was 2.5 months prior to visit. These symptoms were considered severe to patient and he stated that he would not live with them. Medications included, but were not limited to: vaginal estradiol 1 gram three times per week, coenzyme Q10, fish oil, DHEA 50 mg daily, pregabalin 50 mg BID and testosterone cypionate 40 mg twice weekly. His vitals were 139/78, pulse 98, BMI 20.5 kg/m2 and LMP 4/5/2012. Patient was thin, had masculine qualities, frontal hair loss, no acne, normal mood, affect and behavior. Labs revealed estradiol 12.5 pg/mL, vitamin D, 25(OH)D 47.6 ng/mL, total testosterone 728 ng/dL, hematocrit 46%, TSH mildly low to 0.372 uIU/mL (0.450-4.5 uIU/mL) and normal free T4 1.15 ng/dL (0.82-1.77 ng/dL) and normal free T3 3.5 pg/mL (2.0-4.4 pg/mL)

Results: Patient was started on an estradiol 0.025 mg patch twice weekly. He was seen two months later and said that he was feeling some relief with systemic estrogen therapy. Mood was better, but he was still getting approximately two hot flashes a day and waking up from sleep with them. Estradiol patch was increased to 0.0375 mg twice weekly. When he was seen three months later, he said that he was satisfied with treatment and hot flashes had resolved. Estradiol by liquid chromatography tandem mass spectrometry was 34.5 pg/mL. Hot flashes later returned and estradiol was increased slightly to 0.045 mg twice weekly. Given slightly elevated hematocrit, we discussed decreasing the IM testosterone dose, but patient wished to try a topical treatment instead. Patient used a compounded testosterone temporarily and hematocrit normalized to 44%. However, total testosterone was 15.1 ng/mL, which is low when trying to achieve a normal male testosterone range. Patient was switched to topical testosterone gel 40.5 mg daily. His total testosterone increased to 452.5 ng/dL, but hematocrit continues to stay mildly elevated at 48%. Patient was also found to have subclinical hyperthyroidism with a mildly low TSH, but this normalized without any treatment. Conclusion: The two major goals of hormone therapy in transgender patients were (1) to reduce endogenous sex hormone levels, and thus reduce the secondary sex characteristics of the individual’s designated gender, and (2) to replace endogenous sex hormone levels consistent with the individual’s gender identity by using the principles of hormone replacement treatment of hypogonadal patients (1). However, it is important to recognize that female-to-male transgender patients may have menopausal symptoms especially after gender-affirming surgery and these symptoms should be addressed. Management of menopausal symptoms does not have to be significantly different from our cisgender population and will not necessarily prevent us from achieving our transgender medicine goals. Patient preferences along with hormonal and non-hormonal therapies for menopause should be clearly discussed. Estrogen is our most effective treatment to alleviate symptoms of menopause and it can be given along with testosterone therapy.

Sources of Funding: None

P-79. Is stress associated with hot flashes? Ambulatory hot flashes in relation to subjective and objective measures of stress
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Objective: To evaluate the relationship between stress and hot flashes has been inconsistent across studies. Both stress and hot flashes can be assessed by self-report and physiological measures. For example, stress can be assessed by the Perceived Stress Scale (PSS) and also by cortisol levels. Most studies of cortisol levels in relation to hot flashes have failed to look at cortisol levels concurrent with hot flashes. The purpose of this study was to examine the relationship between PSS scores, cortisol levels, and hot flashes. We hypothesized that (1) higher PSS scores and higher salivary cortisol levels would be associated with an increased likelihood of self-reported and biobiologically measured hot flashes, and (2) women with an elevated cortisol awakening response (CAR) would be more likely to report or demonstrate a concurrent hot flash in the morning compared with women with a flatter CAR.

Design: Seventy-two percent of participants reported hot flashes during the past two weeks, 67% demonstrated objective hot flashes with the monitor, and 70% pushed the monitor buttons to record a subjective hot flash. There were no associations between self-reported hot flashes in the past two weeks and PSS scores or salivary cortisol levels at awakening, 30 minutes later, or 3 hours after that. Women were not more likely to have hot flashes just before, during, or after a strong cortisol awakening response (CAR).

There was a suggestion that self-reported hot flashes may be more likely with a flatter CAR (p=0.09). There were no significant correlations between any measures of cortisol level or PSS score and the number of subjective hot flashes reported or objective hot flashes measured during the study period. Finally, in logistic regression analyses, after controlling for relevant variables, neither salivary cortisol levels nor PSS score was a predictor of hot flashes.

Conclusion: A protocol study of subjectively reported and objectively measured stress did not support the hypothesis that stress is associated with self-reported or objectively measured hot flashes. In addition, an elevated CAR was not associated with concurrent hot flashes.

Sources of Funding: UMass Amherst, Center for Teaching

P-80. Health After eARy Menopause due to Oophorectomy: the HARMony Study A protocol
Lara Terra, MD, Flora v. van Leeuwen, prof.dr.ir., Angela Maas, prof.dr., Maartje Hooping, dr., Epidemiology, Dutch Cancer Institute, Amsterdam, Netherlands; Epidemiology, Radboud UMC, Nijmegen, Netherlands; Epidemiology, Erasmus MC, Rotterdam, Netherlands

Objective: Risk-reducing salpingo-oophorectomy (RRSO) at the age of 35 to 45 years is recommended for women with a high genetic risk for ovarian cancer. This procedure decreases the risk of ovarian cancer by 95-96% but also results in an immediate menopause. Current research on potential adverse effects of premenopausal risk-reducing salpingo-oophorectomy, such as increased risk of cardiovascular disease, compromised bone health, cognitive dysfunction and reduced quality of life, is limited, mostly due to short follow up. Design: We will conduct a multicenter cross-sectional study nested in a cohort of BRCA mutation carriers from 8 Dutch centers for hereditary cancer. Eligible patients are women who underwent RRSO before the age of 45. They will be frequency-matched on current age with women above the age of 55 without RRSO or with RRSO after the age of 55. Participants will complete an online questionnaire containing various questions about lifestyle, medical history, risk factors for cardiovascular disease, bone health, cognition and quality of life. Participants will be asked to visit one of the participating hospitals for a blood test, a cardiovascular assessment and a DEXA scan for determining bone mineral density. Afterwards participants will be requested to perform the online Amsterdam Cognition Scale. Results: Since this is a design protocol we do not have results yet. Conclusion: The long-term health effects of premenopausal RRSO are not known. Therefore, this study will provide crucial results to better inform women about the long-term effects of early surgical menopause on cardiovascular disease, bone health, cognition and quality of life.

Sources of Funding: Dutch Cancer Society (KWF)

SEXUAL, OVARIAN AND UTERINE HEALTH POSTER PRESENTATIONS

P-81. The effects of soybean isoflavones and 17β estradiol in the proliferation uterine endocervix of type 1 diabetic rats
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Objective: To evaluate the histomorphometric and immunohistochemical alterations in the uterine endocervix of ovariectomized type 1 diabetic rats (DM1) treated with soybean isoflavones (ISO). Design: Fifteen adult Wistar rats were bilaterally ovariectomized (Ovx) and divided into three groups: Group I (Ovx + DM1) - received vehicle solution (isoelemic); Group II (Ovx+ISO + DM1) - received soybean isoflavones (ISO 150 mg/kg); and Group III (Ovx+EX2+DM1) - treated with 17β-estradiol (10 µg/kg), by gavage for 30 consecutive days. Afterwards, the uterine endocervix was collected, fixed in 10% formaldehyde buffer solution and processed for paraffin embedding. (3 µm) were stained with H&E (hematoxylin and eosin) and morphological and morphometric studies, or subjected to immunohistochemistry for detections of Ki-67 and vascular endothelial growth factor (VEGF). The obtained data were submitted to statistical analysis (p ≤ 0.05). Results: We noted an atrophic uterine endocervix in the all (Ovx+DM1), whereas it was more voluminous in the GI (Ovx+DM1+ISO) and even more voluminous in the GI (Ovx+DM1+1E2). The thickness of the cervical mucosa was...
significantly higher in GII, as compared to GCtrl. For immunohistochemical results, Ki67 expression was significantly lower in GM1 and GM2 when compared with GCtrl. Regarding VEGF, there were no trophic results for both GM1 and GM2 when compared to the Ctrl group. The quantity of glands showed trophic results for groups GM1 in relation to the Ctrl group. For the eosinophils evaluation, the results were trophic for both GM1 and GM2 when compared with GCtrl. In regard of collagen percentage, GM1 showed a decreased expression when compared with GCtrl. However, GM2 showed trophic results when compared with GCtrl. For immunohistochemical results, Ki67 expression was significantly lower in GM1 and GM2 when compared with GCtrl. Regarding VEGF, there was a similar result, with a lower expression in GM1 and GM2 when compared with GCtrl. Conclusion: Melatonin do not promote proliferative and angiogenic effects in the endometrium of rats in the permanent estrous phase Sources of Funding: None

P.83. The effects of Lepidium meyenii Walp (Peruvian maca) on the sexual function of postmenopausal women BENEDITO F. DOS REIS, PhD1, SONIA MARIA ROLIM ROSA LIMA, PhD, GUSTAVO MAXIMILIANO D. SILVA, MD,2, SOSTENES POSTIGO, MD,2, ANTONIO MARCOS C. FRANCISCO, PhD,2, LYLIANA COUTINHO R. BARBOSA, PhD,2, LUCAS DE OLIVEIRA FERRER,2, ORLANDO BRUNET FILHO,1 GINECOLOGIA, Vale do Sapucai University - UNIVAS, Pouso Alegre, Brazil; 1GINECOLOGIA, Faculty of Medical Sciences of Santa Casa de Sao Paulo - FCMSCS, Sao Paulo, Brazil, Brazil

Objective: To evaluate the effects of Lepidium meyenii Walp (Peruvian maca) on the sexual function of postmenopausal women Design: It was a clinical, prospective, randomized, double blind trial in which 40 postmenopausal women were attended at the Climacteric clinic of Vale do Sapucai University (UNIVAS) in Brazil. The diagnosis of sexual dysfunction was made by a physician with experience in and through the Female Sexual Function Index Questionnaire (FSFI) and after signed the Informed Consent Term. Then they were allocated in two groups with 20 women each: Maca (one capsule of 875 mg of Lepidium meyenii extract ingested 12/12 h) and Control (one capsule of placebo ingested 12/12 h). The questionnaires were applied at the first visit, after 90 days and 180 days of medication or placebo. Results: The healthy women allocated had a mean age range of 49.2 ± 2.3 years, postmenopausal age of 13.5 ± 0.9 years, whose origin was Caucasian. The study was concluded with 25 women, 15 women in the maca group and 10 women in the control group. Where six FSFI’s domains were evaluated: Desire, Excitacion, Lubrication, Orgasm, Satisfaction and Pain. Results were obtained with significant difference in the domains of: Desire, Excitacion, Orgasm and Pain in the Maca group compared to the Control with 90 days. After 180 days, the domains of: Desire, Excitacion, Lubrication and Orgasm presented a significant difference for the Maca Group compared to Control. Conclusion: The use of Lepidium meyenii Walp (Peruvian Maca) in postmenopausal women showed significant improvement in the FSFI domains: Desire, Excitacion, Orgasm and Pain in 90 days and after 180 days in the domains: Desire, Excitacion, Lubrication and Orgasm. Sources of Funding: None

P.84. Study Prevalence of Hypoactive Sexual Desire Disorder in Brazilian Postmenopausal Woman with Metabolic Syndrome Gustavo M. Dutra da Silva, PhD student1, SONIA MARIA ROLIM ROSA LIMA, PhD1, BENEDITO F. DOS REIS, PhD2, SOSTENES POSTIGO, MD1, Carolina F. Macruf1. Obstetrics and Gynecology, Santa Casa de Sao Paulo Medical School, Sao Paulo, Brazil; 1Sao Francisco University, Bauru, Brazil, Brazil, Brazil

Objective: To evaluate the prevalence of Postmenopausal Disorder in Brazilian postmenopausal women with the diagnosis of Metabolic Syndrome and to compare them to women without this diagnosis. Design: A cross-sectional, prospective, case-controlled study was carried out by interviewing 1,100 postmenopausal women who attended the Climacteric Outpatient Clinic of the FCMSCS and at the HMLMB. Women are regularly seen in these institutions to perform routine climacteric exams. After performing care and evaluation of inclusion and exclusion criteria, 291 women were invited to participate in the study. All participants signed the Free and Informed Consent Form. The women considered as being postmenopausal were those with amenorrhea a 1 year and FSH ≥20mIU/mL (1). Sexual function was assessed by completion of the Female Sexual Function Index (FSFI). A score of 5 or less on the combination of items comprising the desire domain of the FSFI questionnaire was used to define the diagnosis of HSDD in postmenopausal women. We consider that a score of 6 or more the woman does not present with HSDD. The type of diagnosis based on the DSM-IV-TR. The diagnosis of sexual dysfunctions was established by a sexology specialist experienced and trained in diagnosing FSD using structured clinical interviews. The Beck Depression Inventory was used to exclude depression in patients with a history of the disease. The MetS diagnosis was determined by following the guidelines defined by the Adult Treatment Panel (ATP III) (8): (1) Abdominal circumference (AC) ≥88cm; (2) HDL-cholesterol <50mg/dL; (3) triglycerides ≥150mg/dL; (4) arterial blood pressure (BP) >130/85mmHg; and (5) fasting glucose ≥110mg/dL. Women considered as carrying MetS were those with at least three of the components described. All of the women underwent the standard anamnesis of the service. Blood pressure (BP) readings were taken, waist circumference (WC) measured and body mass index (BMI) calculated, gynecological exams conducted and cytology collected for the Papanicolaou smears. Subsequently, laboratory exams (total cholesterol and fractions, triglycerides and fasting glucose) were ordered, along with bilateral mammography and transvaginal ultrasound exams, in line with the basic prophedetics of the service. The study was carried out in compliance with the protocol and principles established in the Declaration of Helsinki (1996 version), the International Conference on Harmonisation Harmonised Tripartite Guideline and with the Guidelines for Good Clinical Practice and applicable regulatory requirements. The protocol was approved by the Research Ethics Committee of the FCMSCS and of the HMLMB (CAAE Permit 405948/14.0000.5479) and under the Clinical trials ID NCT02430987. Results: The diagnosis of HSDD was statistically higher in women diagnosed with MetS (p = 0.001) than in women without this diagnosis (p = 0.005). Overweight (N = 126) and obesity (N = 101) also had this ratio when compared to the control group (normal BMI, N = 64) (p = 0.036). Women with a diagnosis of SAH (N = 146) and increased triglycerides (p = 0.03) (N = 115) also presented more diagnosis of HSDD compared to women without these conditions. All scores of the FSFI domains of desire, arousal, lubrication, orgasm, satisfaction, total score, diagnosis of FSD by both cut-offs were statistically lower in postmenopausal women with MetS (N = 153) (p <0.05) when compared to women without this diagnosis (N = 138), except for the pain score (p = 0.913). The presence of FSD was statistically higher in women with MetS, regardless of the metabolic criteria used (p <0.05). Conclusion: Through this study, we can conclude that postmenopausal women diagnosed with MetS present higher rates of HSDD when compared to women without this diagnosis. Sources of Funding: None

P.85. Ophiopogon japonicus selectively inhibited cell proliferation and induced apoptosis in human uterine leiomyoma cells Minhyung Jung. Kyunghee university, Seoul, Korea (the Republic of)

Objective: To investigate the anti-proliferative effect of the Ophiopogon japonicus in cell proliferation and apoptosis in primary cultured human uterine leiomyoma cells. Design: IRB approved this study and we obtained informed consent from the patients. The myoma and myometrium were obtained from the patients who were underwent hysterectomy. Cell viability was measured by MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. Caspase-3 activity assay and DNA fragmentation assay were performed to determine the effect of apoptosis. The expression of apoptosis regulatory-related proteins was evaluated by western blot. Results: The cell viability and proliferation of uterine leiomyoma cells were significantly reduced by Ophiopogon japonicus treatment rather than myometrium cells in a dose-dependent manner. DNA fragmentation assay results showed apoptotic cell death after Ophiopogon japonicus incubation. Ophiopogon japonicus activated caspase-3, -8, and -9, causing apoptosis in uterine leiomyoma cells. Down-regulation of Bcl-2, XIAP, and FLIP with a concomitant increase in Bax, Fas, and DR5 were observed. Conclusion: These results provided the first evidence that Ophiopogon japonicus induced both intrinsic and extrinsic apoptosis. Therefore, Ophiopogon japonicus may be a promising chemopreventive and therapeutic agent against human uterine leiomyoma. Sources of Funding: None
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Objective: Dilators are poorly characterized in the scientific literature yet may facilitate reconditioning the brain body reconnection for anticipatory anxiety. Some post-menopausal women experiencing dyspareunia use vaginal dilators to facilitate penetrating intercourse with less pain. However, women often report of decreased compliance, burdensome regimes, and excessive time commitments as well as concern about stepwise abrupt transitioning from one size to another. Milli is a patient controlled electronically adjustable dilator that expands 1 mm at a time that attempts to rectify many of these dilemmas. The secondary launch (n=130) of this novel dilator is reported here. Design: The Milli device was available for a selected group of patients and used in conjunction with diverse group of sexual medicine specialists. Each Milli patient participated in a phone interview, introduction survey (n=130) and 3-month follow-up survey (n=80 collected). Patients were offered the device at a 50% discounted trial price for anonymous participation. Results: Milli is designed to be inserted at the smallest diameter (15mm), and expand in 1 mm slow patient-controlled increments and can expand to a maximum diameter of 40mm. The most common goals for patients were: return to penetrative intercourse and pain reduction during coitus. Patients saw their clinician on average every 13 weeks (range 1-52 weeks) Outcomes monitored included: 1) return to intercourse (27% of non-active returning to intercourse) 2) reduction in pain scores 0-10 (1.5 point reduction) 3) Increase in Milli Diameter (7.1mm) and 4) subjective feedback regarding progress toward goals (89% reported progress). 60% of patients had suffered from their medical condition for >2 years, 25% haven’t been sexually active for >5 years, and 73% engaged in penetrative sex despite experiencing pain. Patients used Milli on average 3 days/week. The most common emotions patients to describe their treatment were “anxious”, “frustrated”, yet “empowered” and “optimistic”. The average dilation session was 15 minutes, mostly in the evening/bedtime (75%), in the bedroom (90%). Adjunctive treatment included moisturizers, local estrogen products and physical therapy. Women most often watched TV, videos, read, listened to soothing music while dilating. Only 27% have used their dilators with their partners before coitus, 83% of those patients were post-menopausal. There were no serious adverse events reported. All participants reported that Milli was superior to conventional dilators because of the ability to expand while already inserted and smaller increments resulted in improved confidence. The option of dilation nature (used by 87% of patients) and ethically pleasing dilator cover design (soft, easy to clean) were also positive attributes. Factors that showed trends to improved patient outcomes were use of vibration, length of Milli treatment (>3 months), dilation sessions >15min, dilating with their partners prior to intercourse, and use of candles and soothing music. Factors not associated with improvement trends were: when/where patients dilated, and other patient demographics including condition, race, or religious views. Conclusion: Milli ™ shows excellent promise in a limited launch for safety and efficacy with high patient satisfaction and compliance. Slow incremental dilation, with vibration, every other day for 15-30 min, prior to intercourse may optimize returning to intercourse with less pain. Larger long-term interventions investigating a standardized dilation program are also planned post marketing.

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Vincent C enhances in vitro development of ovarian follicles in aged mice Seung-Yup Ku1,2, Yoon Young Y. Kim, PhD,3 Young Jae Ryu2,1, Hoon Kim, MD, PhD,1 Chang Suk Suh, MD, PhD,1 Dept. of OBGYN, Seoul National University Hospital, Seoul, Korea (the Republic of); 1Biomedical Research Institute, Seoul National University Hospital, Seoul, Korea (the Republic of); 2Department of OBGYN, Seoul National University Hospital, Seoul, Korea (the Republic of)

Objective: Ovarian reserve of women is critically related to contents of follicles in ovaries. As the declining of ovarian reserve in aged or menopausal women, major populations of follicles are altered from pre-antral to primordial follicles. Therefore, new strategies for the development (maturation) of remaining follicles are essential for menopausal women who want to be pregnant. In this study, we tried to develop an in vitro follicular maturation condition with vitamin C (L-ascorbic acid) for remaining follicles of menopausal stage, aged mice to establish the proper time point of vitamin C for the follicle maturation. Design: Secondary follicles of 24-week-old mice were isolated using mechanical direction and cultured in the presence of 100 µM L-ascorbic acid (vitamin C) or not. In treatment was started from early (day 0) or late (day 9) period of development. Growth of follicles were daily observed and the diameter was calculated. The expressions of specific genes, BMP15, GDF9 and figla, were evaluated by qPCR. Results: In this study, treatment with vitamin C significantly enhanced the in vitro development of follicles from 24-week-old mice in comparison with 2-week-old mice. The growth of follicles from early treatment was significantly enhanced than those from late treatment. In addition, the expression of the development related gene upregulated in vitamin C treated group. Conclusion: In conclusion, we suggest that vitamin C could be used as co-factor for preserving ovarian reserve of menopausal stage of female.

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Women’s Views on Hypoactive Sexual Desire Disorder: A Survey Aisha M. Van Pratt Levin1, Percy Yeung, PhD,2 Nancy Phillips, MD,2-3 Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ; 1Women’s Health Institute, New Brunswick, NJ

Objective: Decreased sexual desire is estimated to affect up to 41% of women globally (1.2). Hypoactive sexual desire disorder (HSDD), which requires that the decrease in desire causes distress occurs in about 10-12% (3). Studies generally agree that the incidence of HSDD is greatest after age 40 in elderly women, but there is little data regarding younger women. Methods: We surveyed 130 women (less than 65 years of age) (3). There is little data which ascertains women’s knowledge of HSDD as a recognized medical disorder or of the availability of treatment, especially differentiated by menopausal status. Design: An IRB approved survey on HSDD was distributed to women aged 18 and over presenting to a gynecology practice. Demographics related to age and menopausal status were collected. The purpose of this analysis was to compare the incidence of decreased desire and HSDD between pre-and post-menopausal women, and also to see if there was a difference between these two groups in their recognition of this as a disorder, or their awareness of an FDA approved medication for its treatment. Results: 310 women completed the survey. (190 premenopausal, 87 post, and 33 who preferred not to answer) 23% of premenopausal and 36.8% of postmenopausal reported decreased desire (p<0.05), with 52.3% of pre and 43.7% of postmenopausal women reporting distress (p<0.01). The incidence of HSDD was 12.1% in pre and 16.1% in post-menopausal women (p<0.5). 25% of all respondents were aware that HSDD was a medical condition, (24.74% pre and 28.74% post, p<0.05), but only 12.5% were aware of an FDA approved medication for its treatment (11.17% pre and 15.66% post, p<0.03). In the women who reported having HSDD the overall number aware of its designation as a disorder dropped to 17% in the premenopausal women, but rose to 28.6% in the postmenopausal population (p<0.42). Yet only 7% with the disorder (none of whom were premenopausal) were aware of an FDA approved medication for its treatment.

Conclusion: In this survey, postmenopausal women reported significantly more decreased desire than premenopausal women, and better knowledge of HSDD as a medical condition, but there was no difference in the rate of HSDD between the two groups. Overall knowledge of HSDD as a medical disorder and availability of FDA approved medication was low in both groups, even among women aware of its designation as having HSDD. Better health care professional-patient communication is needed to improve awareness of HSDD. Although no FDA approved medical treatment is available for post-menopausal women, interventions may be available to improve their symptoms. Acknowledgment: None of our study was the total number of participants. A weakness of our study was the number of women who did not identify their menopausal status. Our data may yield different results if stratified by age. References: McCool ME, Zuleke A, Thourich MA, Knauttel H, et al. Prevalence of Female Sexual Dysfunction Among Premenopausal Women: A Systematic Review and Meta-analysis of Observational Studies. Sex Med Rev 2008;4(3):197-212. Kingsberg, SA, Rezaee, RL. Hypoactive sexual desire in women. Menopause. 2013: 20(12): 1284–1300. Shifren, Jan L. Monz, Brigitta U, et al. Sexual Problems and Distress in United States Women: Prevalence and Correlates Obstetrics & Gynecology 2008; 112(5):970-978.

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Sexual Function in Afro-Descendant Women in Climacteric with Severe Deterioration of the Urogenital Domain Alvaro Monterrosa-Castro1,2, Sally Parra-Almeida1,2, Katherin Peralta-Buelvas1,2, Maria Fernanda Mercado-Lara1,2,1Grupo de Investigación Salud de la Mujer, Cartagena, Colombia; 2Universidad de Cartagena. Colombia. Cartagena, Colombia

Objective: The estrogen deprivation own of climacteric produces changes in the uterine tract: weight loss of the mucosa with loss of the rough folds and of the columnar epithelium of the vaginal, urethral and vesicle epithelium; increase of the ph., cervical and vaginal fragility, with loss of the adipose tissue of the vulva, laxity of the labia majora, decrease of the elasticity and turgescence. The objective to assess the sexual function, in Afro-descendant women in Colombia, with severe deterioration of the urogenital tract. Methods: Cross-sectional study, which is part of the CAVIMEC (Calidad de Vida en la Menopausia y Etnias Colombianas) project, carried out in Afro-descendant women resident in municipalities of the Urbá Antioqueño, to the west of Colombian, with age between 40-59 years old, who participated voluntarily. A questionnaire of

Characteristics.
P-90. Differences in Female Sexual Function by Region and Ethnicity: A Cross-sectional survey of menopausal women in West Texas and Central Arizona

Beth Prairie, MD MPH1, Juliana Kling, MD MPH1, Matthew Buras, Masters Degree, Arizona

Objective: Sexual complaints are frequently reported during menopause and women with sexual dysfunction report lower health-related quality of life. Factors such as ethnicity and socioeconomic status may impact sexual function but research is limited. Our study aim was to evaluate differences in sexual function in menopausal women of different geographic locations with diverse socioeconomic and ethnic backgrounds. Design: A cross-sectional, anonymous survey study was conducted by mail and online to evaluate self-reported sexual function in menopausal women aged 40-60 years who spoke English or Spanish. Surveys were distributed in 2012 in West Texas, and 2016 in Scottsdale, AZ. The survey included the Greene Climacteric Scale (GCS), Female Sexual Function Index (FSFI), and patient demographic and socioeconomic questions. Lower FSFI scores are consistent with worse sexual function and sexual dysfunction is defined as an FSFI ≤26.55. Higher GCS scores signify more menopausal symptoms, and can be broken into symptom clusters (psychological, anxiety, depression, somatic, vasomotor). Surveys were mailed to 1,000 women in each community. Post mailing, community group outreach was conducted to attempt to collect additional data to achieve recruitment goals set by power analysis. In Texas, an online questionnaire option was made available post mailings. All data were de-identified and analyzed in SAS. Descriptive statistics were used to assess all variables. The Wilcoxon Rank-Sum test was used to compare the GCS and FSFI score differences between the two sites. Chi-square tests were used to compare menopausal and socio-demographic characteristics differences between Hispanic and Non-Hispanic women. Design: A cross-sectional, anonymous survey study was conducted by mail and online to evaluate self-reported sexual function in menopausal women aged 40-60 years who spoke English or Spanish. Surveys were distributed in 2012 in West Texas, and 2016 in Scottsdale, AZ. The survey included the Greene Climacteric Scale (GCS), Female Sexual Function Index (FSFI), and patient demographic and socioeconomic questions. Lower FSFI scores are consistent with worse sexual function and sexual dysfunction is defined as an FSFI ≤26.55. Higher GCS scores signify more menopausal symptoms, and can be broken into symptom clusters (psychological, anxiety, depression, somatic, vasomotor). Surveys were mailed to 1,000 women in each community. Post mailing, community group outreach was conducted to attempt to collect additional data to achieve recruitment goals set by power analysis. In Texas, an online questionnaire option was made available post mailings. All data were de-identified and analyzed in SAS. Descriptive statistics were used to assess all variables. The Wilcoxon Rank-Sum test was used to compare the GCS and FSFI score differences between the two sites. Chi-square tests were used to compare menopausal and socio-demographic characteristics differences between Hispanic and Non-Hispanic women. Results: One hundred and ninety nine women completed surveys in West Texas, and 163 in Scottsdale. Women on average were 51.5 (5.0 and prevalence of sexual dysfunction of 3%) in the Texas participants, 96% (28.2%) reported severe deterioration of the uterine domain. These had greater age, greater number of children, greater presence of arterial hypertension and greater proportion of women in postmenopause. There were no differences between the two groups in terms of body mass index, education, coffee consumption, smoking, presence of diabetes mellitus or hypothyroidism. Significant difference was found in all the items and in the total score of the FSFI-6, the greater deterioration was found between women with severe uterine deteriorations. Women with severe uterine deterioration had significantly greater psychological sexual desire, low sexual excitement, poor genital lubrication, loss of sexual organs, inadequate sexual satisfaction and more presence of pain. The prevalence of sexual dysfunction was significantly greater in women with severe uterine deterioration than in those who did not have it, 73.7% [CI95%: 63.9-82.0] and 15.1% [CI95%:11.1-20.0], respectively p<0.001. To have severe deterioration of the uterine domain was risk factor for sexual dysfunction OR: 6.8 [95%:1.4-33.1] Conclusion: The presence of severe uterine deterioration increased significantly the risk of sexual dysfunction in a group of afro-descendant women in the west of Colombia

Sources of Funding: None

P-91. Soy Isoflavones Protect Against Oxidative Stress and Diminish Apoptosis in Ovary of Female Rats

Cristiane d. Teixeira1, Rinaldo Florencio-Silva, Post Doctoral2, Gisela R. Sasso, postdoctoral fellow3, Ricardo d. Simões, Manuel d. Simões1. 1Morphology and Genetics, Universidade Federal de São Paulo, SP, Brazil; 2Ginecology, Universidade de São Paulo, São Paulo, Brazil Objective: Menopause results from quantitative and qualitative declines in follicular reserve. Oxidative stress seems to increase apoptosis and has been implicated in aging population. Soy isoflavones have antioxidant activity. We here investigated follicular reserve, apoptosis and oxidative stress in the ovary of 3 and 12-month-old rats treated with soy isoflavones. Design: Twenty-six female rats at 3 and 12-month-old were divided into groups and daily treated by gavage with soy isoflavone extract or propylene glycol vehicle. After 8 weeks, rats were euthanized and ovaries removed. Ovaries were processed for histomorphometric analysis (% follicles) and apoptosis (cleaved-caspase-3 and BCL2). Ovaries were subjected to reactive oxygen species levels, total antioxidant capacity and lipid peroxidation assays. Results: A significant decrease in atretic follicles was noticed in 12-month old treated rats. In isoflavone-treated groups, there was a decrease in cleaved-caspase-3 positive cells at 3- and 12-month old rats, and an increase in BCL2-positive cells only in 12-month old rats compared to age-matched controls. Isoflavones promoted an increase in total antioxidant capacity as a decrease in reactive oxygen species levels and in lipid peroxidation in both 3- and 12-month-old. Conclusion: Soy isoflavones can decrease follicular atresia, apoptosis and oxidative stress, as well as increase total antioxidant capacity in ovarian tissue of rats. The anti-apoptotic effects of soy isoflavones are, at least in part, related to the antioxidant capacity of these compounds.

Sources of Funding: NONE

P-92. Effects of Korean red ginseng on endometrium: in vitro and human data

Jisun Yun, M.D.1, Young Bin Won, M.D.1, Inha Lee, M.D.1, Jae Hoon Lee, M.D. 1, Bo Seok Lee, M.D.1, Jisun Yun, M.D.1, Dae Hyun Choi, M.D.1, Young seok Lee, MD., Ph.D.1, Seok kyo Seo, MD., Ph.D.1. 1Department of Obstetrics and Gynecology, Severance hospital, Yongdusan University College of Medicine, Seoul, Korea (the Republic of); 2Department of Obstetrics & Gynecology, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea (the Republic of) Objective: In order for Korean red ginseng (KRG) to be widely used by women, the safety of KRG on endometrium have to be proven. The aim of this study was to investigate the effects of KRG on endometrium. Design: Endometrial stromal cells (ESCs) were isolated and cultured from endometrial tissue of patients with fibroids undergoing hysterectomy. ESCs and Ishikawa cells were treated with different concentrations of KRG extracts for 48h. Cell proliferation and apoptosis were assessed by CCK-8 assay and flow cytometry, respectively. Western blot analysis was used to quantify the expression of apoptosis- related proteins. In addition, ESCs were further cultured in a randomized controlled trial for human data. Results: KRG extract was found to inhibit proliferation and induced apoptosis in both ESCs and Ishikawa cells with the effects dependent on its concentrations. KRG extract increased the activities of caspase-3, -8 and -9 in both cells. KRG extract also triggered pro-apoptotic signals including increase of BAD, BAX and BAX, and decrease of Bcl-2 and Bcl-XL in both cells. Serum hormone levels and endometrial thickness were not influenced by KRG supplementation in postmenopausal women. Conclusion: KRG extract is a potent proliferation inhibitor in ESCs and Ishikawa cells. In addition, KRG supplementation had no effect on the endometrium of postmenopausal women. These results suggest that KRG may be safely used in postmenopausal women.

Sources of Funding: None

socio-demographic characteristics, the Menopause Rating Scale (MRS) to identify the socioeconomic and demographic variables will aid in identifying the role geographic location may be playing in these findings.

Sources of Funding: None

Assessment of the sexual function with the FSFI-6

Objective: Sexual complaints are frequently reported during menopause and women with sexual dysfunction report lower health-related quality of life. Factors such as ethnicity and socioeconomic status may impact sexual function but research is limited. Our study aim was to evaluate differences in sexual function in menopausal women of different geographic locations with diverse socioeconomic and ethnic backgrounds. Design: A cross-sectional, anonymous survey study was conducted by mail and online to evaluate self-reported sexual function in menopausal women aged 40-60 years who spoke English or Spanish. Surveys were distributed in 2012 in West Texas, and 2016 in Scottsdale, AZ. The survey included the Greene Climacteric Scale (GCS), Female Sexual Function Index (FSFI), and patient demographic and socioeconomic questions. Lower FSFI scores are consistent with worse sexual function and sexual dysfunction is defined as an FSFI ≤26.55. Higher GCS scores signify more menopausal symptoms, and can be broken into symptom clusters (psychological, anxiety, depression, somatic, vasomotor). Surveys were mailed to 1,000 women in each community. Post mailing, community group outreach was conducted to attempt to collect additional data to achieve recruitment goals set by power analysis. In Texas, an online questionnaire option was made available post mailings. All data were de-identified and analyzed in SAS. Descriptive statistics were used to assess all variables. The Wilcoxon Rank-Sum test was used to compare the GCS and FSFI score differences between the two sites. Chi-square tests were used to compare menopausal and socio-demographic characteristics differences between Hispanic and Non-Hispanic women. Results: One hundred and ninety nine women completed surveys in West Texas, and 163 in Scottsdale. Women on average were 51.5 (5.0 and prevalence of sexual dysfunction of 3%) in the Texas participants, 96% (28.2%) reported severe deterioration of the uterine domain. These had greater age, greater number of children, greater presence of arterial hypertension and greater proportion of women in postmenopause. There were no differences between the two groups in terms of body mass index, education, coffee consumption, smoking, presence of diabetes mellitus or hypothyroidism. Significant difference was found in all the items and in the total score of the FSFI-6, the greater deterioration was found between women with severe uterine deteriorations. Women with severe uterine deterioration had significantly greater psychological sexual desire, low sexual excitement, poor genital lubrication, loss of sexual organs, inadequate sexual satisfaction and more presence of pain. The prevalence of sexual dysfunction was significantly greater in women with severe uterine deterioration than in those who did not have it, 73.7% [CI95%: 63.9-82.0] and 15.1% [CI95%:11.1-20.0], respectively p<0.001. To have severe deterioration of the uterine domain was risk factor for sexual dysfunction OR: 6.8 [95%:1.4-33.1] Conclusion: The presence of severe uterine deterioration increased significantly the risk of sexual dysfunction in a group of afro-descendant women in the west of Colombia

Sources of Funding: None
P-93. Depression, anxiety and stress in women with premature ovarian insufficiency using Hormone Therapy - a comparative study of age-matched women with preserved ovarian function

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Objective: To evaluate some psychological aspects of women with premature ovarian insufficiency (POI) receiving multidisciplinary treatment with medical, nutritional, psychological and physiotherapeutic support and using hormone therapy (HT).

Design: A cross-sectional study of 61 women (between 18 and 45 years of age) with POI using HT and receiving multidisciplinary care (POI group), and 61 women with preserved ovarian function, matched one by one by age ± 2 years (control group). Age, single sexual partner, number of children, number of abortions, time of diagnosis and time of treatment were evaluated (the last two for the POI group). The tools used to evaluate depression, anxiety and stress were Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and LIPP Stress Symptom Inventory (LSSI) respectively. The study was approved by the Ethics Committee of the Institution (CAEÉ 61821516.0.000.5404).

Statistical analysis: Chi-square or Fisher’s exact tests for qualitative variables, and Mann-Whitney or Kruskal-Wallis for comparison of numerical variables were used. Spearman correlation or logistic regression analysis with Stepwise criteria was also used. (p<0.01).

Results: Women with POI and the control group presented 35.0 ± 7.6 and 34.4 ± 7.5 years, respectively (p = 0.63). Women with POI had been diagnosed 10.4 ± 7.4 years beforehand (median 8 years); treatment time with HT was 7.8 ± 6.0 years (median 7 years). Number of children was 0.4 ± 0.9 for patients who had POI, yet nulliparous, whereas in the control group it was 1.2 ± 1.3 children (p = 0.001). In the IOP and control groups, total BDI, BAI and LSSI scores were 15.7 ± 11.6 and 13.6 ± 8.4, (p = 0.64); 17.5 ± 13.1 and 17.2 ± 11.0 (p = 0.90), respectively, with no difference between the groups, however 30% and 28% for POI and control (p=0.17) respectively, presented moderate to severe depression, and 41 and 47% presented moderate to severe anxiety (p = 0.78) respectively. In women with POI, depression was positively correlated with the number of children (each child presented a 2.3 times increased risk of depression) and anxiety, while anxiety and stress were also positively correlated. The other variables were not correlated with the psychological aspects evaluated. Conclusion: Although literature associates receiving the diagnosis of POI to different psychological disorders, the long-term repercussions are not clearly understood. Our results show that women with POI undergoing hormone treatment and receiving multidisciplinary care have depression, anxiety and stress indexes similar to those of women with normal ovarian function, but depression and anxiety may be undiagnosed in both groups.

Sources of Funding: None

Comparison of depression, anxiety and stress indexes among women with premature ovarian failure and women with preserved gonadal function matched by age ± 2 years.

SD: Beck Depression Inventory/ BAI: Beck Anxiety Inventory /LSSI LIPP Stress Symptom Inventory

P-94. Factors Associated with Sleep Disorders in Women in Climaetic

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Objective: Sleep is a physiological process of vital importance for the integral health of human beings. It could present alterations and to produce cognitive, organic and psychological changes. There are different factors that could affect it. The hormonal changes during climacteric provoke the apparition of sleep disorders. The objective is to establish the factors associated with sleep disorders in Colombian women in climacteric, who live in the Caribbean.

Design: Cross-sectional study, which is part of the CAVIMEC (Calidad de Vida en la Menopausia y El Tlnas Colombianas) project, carried out in Colombian women in climacteric, with age between 40-50 years old.

Pregnant women, those who did not want to participate, those with psychiatric history, mental deficiency or physical disorders that made difficult the participation in the study were excluded. An anonymous survey was applied, which included general socio-demographic questions and the Jenkins Sleep Scale (JSS), the Menopause Rating Scale (MRS), the International Consultation on Incontinence Questionnaire Short-Form (ICIQ-SF), Perceived Stress Scale (PSS), the Goldberg Anxiety and Depression Scale (GAD-7), the SCOFF questionnaire, a screening tool for eating disorders, and the short loneliness scale. A sample of 585 women was calculated. The population was divided in two groups according to the JSS: Women with sleep disorder (with scoring greater than or equal to 1) and without it (scoring equal to 0). The analysis was carried out with

SPSS-21. Categorical data was expressed as percentages with confidence interval of 95% (95%CI) and continuous data was expressed as median (Me) with interquartile range (IR). The differences of percentages were evaluated with χ2 test and differences of medians with Mann Whitney. Association, Odds ratio (OR), was established between sleep disorders and the other variables by means of logistic regression. A p value <0.05 was considered as statistically significant. This study was approved by the Ethics committee of the Universidad de Cartagena. Results: 90.3% [95%CI 87.5-97.5] of the studied women presented sleep disorder. There were no significant differences in the age between women with sleep disorder, Me=47 [IR:6,5], and those who were not presenting it, Me=48 [IR:6,0], p=0.51. The presence of sleep disorder was higher in those in menopause [91.5% [95%CI 88.8-93.7], followed by afro-descendants and indigenes. 73.9% [95%CI 51.6-98.9] and 75% [95%CI 50.9-91.3], respectively, p=0.001. 92.7% [95%CI 89.1-95.1] of postmenopausal women presented sleep disorders, different from women in perimenopause and premenopause, 90.0% [95%CI 82.4-95.1] and 85.4% [95%CI 79.7, 90.5], respectively, p=0.04. The median of the punctuation of the MRS was greater in those women with sleep disorder, Me=18 [IR:10], than in those without it, Me=11.0 [IR:18.5], p=0.003. To have clinically meaningful depressive symptoms (Goldberg) increased more than five times the risk of presenting sleep disorder. To have symptoms of anxiety, urinary incontinence, eating disorders, perceived stress, loneliness and deterioration of the quality of life, were not factors associated significantly.

Conclusion: The prevalence of sleep disorder, especially in postmenopause, was high. Clinically meaningful depressive symptoms were identified as risk factor to develop sleep disorders in a Colombian population.

Sources of Funding: None

Factors associated with sleep disorder in women in climacteric n=585

<table>
<thead>
<tr>
<th>Depressive symptoms</th>
<th>No</th>
<th>Yes</th>
<th>OR (95%CI)</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI score</td>
<td>17.3±13.5</td>
<td>14.8±10.4</td>
<td>0.98 (0.83-1.17)</td>
<td>0.76</td>
</tr>
<tr>
<td>BAI score</td>
<td>9.4±8.2</td>
<td>6.4±5.8</td>
<td>0.39 (0.29-0.53)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

*Adjusted by age, ethnic group, labor activity, civil status, sexual partner, wine consumption, use of hormonal therapy, climaetic status, urinary incontinence, probable anxiety, probable depression, total score of the loneliness scale, total score of the MRS, severe urgenental deterioration and for the 11 climaetic symptoms of the MRS, **Wald test, ***Significant

P-95. Impact of Depressive Symptoms on Acute Stress Response in Midlife Women

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Objective: Depression and PTSD are associated with altered perceived stress and hypothalamic-pituitary-adrenal (HPA) axis responsivity, manifesting as an undetectable stress response. We have shown that frequent hot flushes and night sweats, or vasomotor symptoms (VMS), are associated with a blunted psychological and physiological acute stress response in midlife women. As VMS are strongly linked with depressive symptoms, we examined whether current depressive symptoms also correlate with a small anxiety and cortisol response to an acute stressor in women with VMS and without VMS.

Design: 37 unmedicated midlife women without a current major depressive episode completed the Montreal Imaging Stress Task (MIST), an acute stress provocation paradigm involving a computerized task combined with low doses of the depressant drug, diazepam.

Women with and without VMS were included and threshold depressive symptoms were allowed. All subjects completed questionnaires assessing depressive symptoms over the past 2 weeks on the Patient Health Questionnaire (PHQ-8). Before and 20 minutes after the task, acute anxiety response on a Visual Analog Scale (VAS) and salivary cortisol were measured. Spearman correlations were used to relate within-person depressive symptoms (PHQ-8) with change in stress (VAS, cortisol) during the task. Results: The median PHQ-8 score was 6, the median increase in anxiety was 6.2 on the 10-point VAS scale, and the median change in cortisol was 0.02 μg/dl. Higher levels of depressive symptoms on the PHQ-8 correlated with a smaller anxiety response to the stress task (r = 0.47, p = 0.01). Similarly, higher levels of depressive symptoms correlated with a blunted cortisol response to the task (r = -0.38, p = 0.02). Depressive symptoms were associated with baseline anxiety (r = -0.40, p = 0.01), but not with baseline cortisol (r = -0.07, p = 0.67).

Conclusion: Results of this analysis show that threshold depressive symptoms are linked with a diminished acute anxiety response and reduced HPA reactivity in midlife women. These findings suggest that depressive symptoms contribute to an altered stress response in midlife women with VMS.

Sources of Funding: None

Impact of Depressive Symptoms on Acute Stress Response in Midlife Women

* Adjusted by age, ethnic group, labor activity, civil status, sexual partner, wine consumption, use of hormonal therapy, climaetic status, urinary incontinence, probable anxiety, probable depression, total score of the loneliness scale, total score of the MRS, severe urgenental deterioration and for the 11 climaetic symptoms of the MRS, **Wald test, ***Significant
P-96

Dietary Intake of Insoluble Fiber is Negatively Associated with Subjective Night Sweats

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Objective: This study was undertaken to investigate the nutritional factors positively or negatively associated with vasomotor symptoms in middle-aged women. Design: The baseline data collected in a previous study that examined the effects of a dietary supplement on a variety of health parameters in 88 Japanese women aged 40 to 60 years were analyzed cross-sectionally. Participants had been assessed for age, menopausal status, lifestyle factors, and body composition. Their vasomotor symptoms were rated as 0 (none) to 3 (severe) according to their responses to the items “hot flush” and “night sweats” on the Menopausal Health-Related Quality of Life (MHR-QOL) Questionnaire. Dietary habits were assessed using the Brief-type self-administered Diet History Questionnaire (B-DHQ), which provided information on the amounts of 97 nutritional factors consumed during the previous month. Results: The average age of the participants was 49.7±5.1 years (mean±standard deviation). The percentage of women who rated their hot flush and night sweats as mild to severe was 28.4% and 20.5%, respectively. None of the 97 nutritional factors were significantly associated (Pearson’s r > 0.3, p<0.05) with hot flush score, whereas insoluble and total dietary fibers were negatively associated with night sweats score (insoluble, r=−0.369, p<0.001; total, r=−0.351, p=0.001). The average dietary intake (g/1,000 Kcal) of insoluble and total dietary fibers were significantly different between the women who were and were not bothered by night sweats (insoluble, 4.3±1.1 vs. 5.8±1.9; total, 6.1±1.7 vs. 8.2±2.2). Multivariate analysis revealed that dietary intake of insoluble fiber (g/1,000 Kcal) was negatively associated with mild to severe night sweats after adjustment for age, menopausal status, body mass index, insomnia, exercise, smoking, alcohol, and coffee consumption (adjusted odds ratio, 0.39; 95% confidence interval 0.19-0.80; p=0.019). No dietary intake of insoluble fiber was negatively associated with subjective night sweats in middle-aged women. Consumption of fruits and vegetables rich in insoluble dietary fibers including cellulose might alleviate night sweats.

Sources of Funding: None

P-97

Efficacy of BedJet for Peri-Menopausal Night Sweat and Hot Flash Symptoms and Corresponding Impact on Sleep Quality

Jordan C. Stern, MD1, Stephanie Zhu1, Inan A. Blow, NY1, Darlyne Johnson, MD2, Jordan C. Stern, MD1, Stephanie Zhu2, Iman A. Blow, NY2, Darlyne Johnson, MD3.

Objective: Hot flashes are a major source of sleep disruption during menopause and perimenopause affecting up to 80% of women. Few non-hormonal effective treatments exist to control nocturnal hot flashes and improve sleep quality during the climacteric. This study evaluates a novel treatment: the BedJet® (a climate controlled air flow bed cover), in a group of women naïve to this treatment. The goal of the study was to determine the clinical efficacy of the BedJet Climate System in relieving various symptoms; including poor sleep quality with night sweats and/or hot flashes; and other non-sleep related symptoms, in a group of perimenopausal and menopausal women.

Design: We evaluated the BedJet’s efficacy using four validated pre and post-treatment surveys, the Pittsburgh Sleep Quality Index (PSQI), the Insomnia Severity Index (ISI), the Functional Outcome of Sleep Questionnaire (FOSQ), and the Greene Climacteric Scale (GCS). We studied 36 perimenopausal and menopausal women 40-60 years of age who reported one or more of the following: worsening night sweats and/ or hot flashes and sleep problems. We examined the data collected from the PSQI, ISI and FOSQ for 36 of the subjects that completed the study; and the Greene Climacteric Scale for 34 of these 36 subjects.

Results: Subjects were dosed for 12 weeks. To assess cognitive function, Trail Making Test parts A and B (TMT-A and TMT-B) were completed by subjects at baseline and at weeks 4, 8, and 12. TMT measures mental acuity, focus, and processing speed, with an increase in time indicating a decline in cognitive function, and a decrease in time indicating an improvement in cognitive function. Subjects were timed while connecting an ascending sequence of 25 numbers for TMT-A and an alternating sequence of numbers and letters for TMT-B, the more complex measure of cognitive function and flexibility. Results: After 12 weeks, mean TMT-B time significantly decreased in the Maca-JDS group compared to the placebo group. TMT-B time decreased by 22 seconds in the Maca-JDS group and by 11 seconds in the placebo group (p<0.05). At week 8, there was a significant decrease in TMT-B time in the Maca-JDS group compared to baseline (p<0.05), while there was no significant change in the placebo group, though a practice effect was evident. There were no differences between groups in TMT-A time at any measured timepoint. There were no serious adverse events reported, and no differences were seen in side effects between the Maca-JDS and placebo groups. Serum estrogen levels did not differ between groups. Conclusion: The results of this clinical study show that Maca-JDS, a proprietary maca blend, doubles the effect on cognitive function compared to placebo, as demonstrated by a significant reduction in TMT-B time after 12 weeks of supplementation. The reduction in TMT-B time indicates enhanced executive functioning, which is important for focus, organization, memory, and flexible thinking. Therefore, Maca-JDS can provide perimenopausal women with a safe and effective treatment option to improve cognitive function and overall mental clarity in everyday life without affecting estrogen levels.

Sources of Funding: This study was funded by JDS Therapeutics, LLC.

P-98

Subjective dizziness in Peri- and Postmenopausal Women is Associated with Anxiety

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Objective: Lepidium meyenii, commonly known as maca, is a Peruvian root vegetable that has been used as a food and therapeutic ingredient for many centuries due to its high nutrient content and various biological effects. Numerous studies support the use of maca to enhance libido, fertility, energy, endurance, and mood. More recently, maca has been studied for its neuroprotective effects and has been shown to improve memory function. Postmenopausal women often report problems with cognitive performance including difficulty remembering, concentrating and thinking clearly. This may be due to a decline in estrogen levels. Although hormone replacement therapy (HRT) may improve cognitive function, the various health concerns associated with HRT point to the need for alternative approaches to treat cognitive impairment associated with menopause. Therefore, Maca-JDS, a proprietary blend of maca, was studied for its effect on cognitive function in perimenopausal and postmenopausal women.

Design: In a randomized, double-blind, placebo-controlled trial, 80 perimenopausal female subjects (35 to 60 years, BMI 18.0-34.9 kg/m²) were randomly assigned to receive 4 capsules/day of Maca-JDS (2.6 g) or placebo. Subjects were dosed for 12 weeks. To assess cognitive function, Trail Making Test parts A and B (TMT-A and TMT-B) were completed by subjects at baseline and at weeks 4, 8, and 12. TMT measures mental acuity, focus, and processing speed, with an increase in time indicating a decline in cognitive function, and a decrease in time indicating an improvement in cognitive function. Subjects were timed while connecting an ascending sequence of 25 numbers for TMT-A and an alternating sequence of numbers and letters for TMT-B, the more complex measure of cognitive function and flexibility. Results: After 12 weeks, mean TMT-B time significantly decreased in the Maca-JDS group compared to the placebo group. TMT-B time decreased by 22 seconds in the Maca-JDS group and by 11 seconds in the placebo group (p<0.05). At week 8, there was a significant decrease in TMT-B time in the Maca-JDS group compared to baseline (p<0.05), while there was no significant change in the placebo group, though a practice effect was evident. There were no differences between groups in TMT-A time at any measured timepoint. There were no serious adverse events reported, and no differences were seen in side effects between the Maca-JDS and placebo groups. Serum estrogen levels did not differ between groups. Conclusion: The results of this clinical study show that Maca-JDS, a proprietary maca blend, doubles the effect on cognitive function compared to placebo, as demonstrated by a significant reduction in TMT-B time after 12 weeks of supplementation. The reduction in TMT-B time indicates enhanced executive functioning, which is important for focus, organization, memory, and flexible thinking. Therefore, Maca-JDS can provide perimenopausal women with a safe and effective treatment option to improve cognitive function and overall mental clarity in everyday life without affecting estrogen levels.

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