Effect of Osteoporosis Treatments on Osteoarthritis Progression in Postmenopausal Women: A Review of the Literature

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Purpose of review: The purpose of this literature review was to determine if medications used to treat osteoporosis are also effective for treating osteoarthritis (OA).

Recent findings: A total of 40 relevant articles were identified. Studies were categorized into those (1) discussing estrogen and selective estrogen receptor modulators (SERMs), (2) bisphosphonates, (3) parathyroid hormone (PTH) analogs, and (4) denosumab, and (5) prior review articles. A large amount of evidence suggests that estrogen and SERMs are effective at reducing OA symptoms and disease progression. Evidence suggests that bisphosphonates, the most common medications used to treat osteoporosis, can reduce OA symptoms and disease progression. In vivo studies suggest that PTH analogs may improve the cartilage destruction associated with OA; however, few human trials have examined its use for OA. Denosumab is approved to treat osteoporosis, bone metastases, and certain types of breast cancer, but little study has been done with respect to its effect on OA. The current evidence indicates that medications used to treat osteoporosis are also effective for treating OA. Estrogen, SERMs, and bisphosphonates have the most potential as OA therapies. Less is known regarding the effectiveness of PTH analogs and denosumab in OA, and more research is needed.

Association of resilience with female sexual dysfunction

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Objectives: Female sexual dysfunction (FSD), a common concern affecting women of all ages, is often mediated by important psychological factors. Resilience has been shown to correlate with psychological well-being across different groups of people. The aim of this study was to assess if there is an association between resilience and FSD.

Study design: This cross-sectional study included 4,366 women (mean [SD] age, 51.7 [11]) seen in women's health clinics at 1 of 3 geographic Mayo Clinic locations. Participants completed the Brief Resilience Scale, the Female Sexual Function Index (FSFI), and the Female Sexual Distress Scale-Revised (FSDS-R). Main outcome measures: We used univariate and multivariable logistic regression analyses to assess associations between resilience, sexual function, and sexual distress, adjusting for potential confounding variables. Results: FSD criteria (FSFI ≤26.55 and FSDS-R ≥ 11) were met by 55.8 % of women. Low, normal, and high levels of resilience were reported by 17.3 %, 57.1 %, and 25.6 % of participants, respectively. The univariate analysis showed that higher resilience was associated with lower sexual distress, lower odds of FSD, and better sexual function. Multivariable analysis adjusted for potential confounders showed that the association persisted and that higher resilience correlated with better sexual function and lower odds of FSD. Conclusions: In this large cross-sectional study, women with higher resilience scores had better sexual function and lower odds of FSD. Additional studies with diverse women are needed to confirm this association and to determine whether women with FSD could benefit from enhancing resilience as a therapeutic strategy.

Coffee Drinking and the Odds of Osteopenia and Osteoporosis in Middle-Aged and Older Americans: A Cross-Sectional Study in NHANES 2005-2014

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The study investigates the association of coffee consumption and odds of osteoporosis/osteopenia among individuals older than 50 years in the United States. In NHANES 2005-2014, drinking ≤ 2 cups(16 oz) of coffee per day can reduce the risk of osteoporosis/osteopenia at the femoral neck and lumbar spine in US adults. Previous epidemiological studies revealed that daily coffee intake reduced the incidence of a cluster of metabolic diseases, however, the link between coffee consumption and prevalence of osteoporosis/osteopenia still remain inconclusive and awaits further confirmation. Based on data collection from 2005 to 2014 survey cycles, National Health and Nutrition Examination
Survey (NHANES), a sample size of 8789 participants aged 50 and above completing two nonconsecutive 24-h dietary recalls were eventually enrolled for analysis. Associations between coffee intake and BMD were assessed. A lower odds of having femoral neck osteopenia/osteoporosis (FOO) was observed in participants with moderate intake of coffee (≤ 2 cups per day), rather than other beverages (OR 0.83; 95% CI, 0.72-0.95; p = 0.01). Moreover, significant associations existed between daily caffeine intake and both FOO and lumbar-spine osteopenia/osteoporosis (LOO). Even after adjusting for decaffeinated coffee, tea, sugar-sweetened beverages (SSBs), and coffee consumption, osteopenia and osteoporosis the odds remained lower at both femoral and neck levels. Our data suggest moderate habitual coffee intake (≤ 2 cups coffee/day) would have protective effects against osteoporosis/osteopenia of femoral neck and spine, among US adults over the age of 50.


Excess morbidity and mortality associated with underuse of estrogen replacement therapy in premenopausal women who undergo surgical menopause


Background: Contrary to clinical guidelines, there has been a decrease over time in estrogen therapy use in premenopausal women undergoing bilateral oophorectomy for benign indications. Objective: The objective of this study was to estimate the excess morbidity and mortality associated with current patterns of estrogen therapy use in women who undergo bilateral oophorectomy with hysterectomy for benign indications. Study design: We developed two Bayesian sampling Markov state-transition models to estimate the excess disease incidence (incidence model) and mortality (mortality model). The starting cohort for both models was women who had undergone bilateral oophorectomy with hysterectomy for benign indications at age 45-49 years. The models tracked outcomes in 5-year intervals for 25 years. The incidence model estimated excess incidence of breast cancer, lung cancer, colorectal cancer, coronary heart disease, and stroke, while the mortality model estimated excess mortality due to breast cancer, lung cancer, coronary heart disease, and all-cause mortality. The models compared current rates of estrogen therapy use with optimal (100%) use and calculated the mean difference in each simulated outcome to determine excess disease incidence and death. Results: By 25 years post bilateral oophorectomy with hysterectomy surgery, there were an estimated 94 (95% CI: -158, -23) fewer colorectal cancer cases, 658 (95% CI: 339, 1,025) more coronary heart disease cases, and 881 (95% CI: 402, 1,527) more all-cause deaths. In sensitivity analyses where we defined estrogen therapy use as a duration of more than 2 years of use, these differences increased more than twofold. Conclusions: Underuse of estrogen therapy in premenopausal women who undergo oophorectomy is associated with significant excess morbidity and mortality.


Sex differences in coronary atherosclerosis during the pre- and postmenopausal period: The Tampere Sudden Death Study

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Background and aims: Women are believed to be protected from coronary heart disease (CHD) by the effects of estrogen but detailed studies on the vessel wall level are missing. We aimed to measure sex differences in atherosclerosis during the premenopausal and postmenopausal periods directly at the coronary arteries. Methods: We analyzed statistics for sex differences in CHD mortality in Finland in 2020. Coronary atherosclerosis was measured using computer-assisted morphometry in 10-year age groups of 185 white Caucasian women and 515 men from the Tampere Sudden Death Study. Results: CHD mortality was rare in both women and men before 50 years of age. After 50 years of age, male mortality increased rapidly, with women reaching equal levels in the oldest age groups. In the autopsy series, there were no differences in fatty streak, fibrotic or calcified plaque areas, nor in the plaque area or stenosis percentage in coronary arteries between premenopausal women and men in the same age group. The plaque area remained 25% smaller in both coronaries in postmenopausal women aged 51-70 years compared to men. In the oldest postmenopausal group (≥70 years), plaque area reached the level of men. In the postmenopausal period, coronary stenosis in the left anterior descending (LAD) artery remained lower among women. Conclusion: We did not detect
any major sex-difference in coronary atherosclerosis in the premenopausal period when women are considered to be protected from CHD. However, in line with CHD mortality statistics, postmenopausal women showed a slower speed of coronary atherosclerosis development compared to men.

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**Migraines, vasomotor symptoms, and cardiovascular disease in the Coronary Artery Risk Development in Young Adults study**

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Objective: To examine whether vasomotor symptoms (VMS) and migraine headaches, hypothesized to be vasoactive conditions, are associated with greater risk for cardiovascular disease (CVD) events including strokes. Methods: We performed a secondary data analysis of a subset of women (n = 1,954) in the Coronary Artery Risk Development in Young Adults (CARDIA) study, a population-based cohort, which began data collection at 18 to 30 y of age. We examined whether migraine headaches and VMS trajectories (characterized as minimal, increasing, and persistent) at CARDIA year 15 examination were associated with higher risk of CVD events and stroke (both ischemic and hemorrhagic) using Cox proportional hazards regression models and adjustment for traditional CVD risk factors (age, cigarette use, and levels of systolic and diastolic blood pressure, fasting glucose, high- and low-density cholesterol, and triglycerides) and reproductive factors. Results: Among women with minimal VMS (n = 835), increasing VMS (n = 521), and persistent VMS (n = 598), there were 81 incident CVD events including 42 strokes. Women with histories of migraine and persistent VMS had greater risk of CVD (hazard ratio [HR], 2.25; 95% CI, 1.15-4.38) after adjustment for age, race, estrogen use, oophorectomy, and hysterectomy compared with women without migraine histories and with minimal/increasing VMS. After adjustment for CVD risk factors, these associations were attenuated (HR, 1.51; 95% CI, 0.73-3.10). Similarly, women with histories of migraine and persistent VMS had greater risk of stroke (HR, 3.15; 95% CI, 1.35-7.34), but these associations were attenuated after adjustment for CVD risk factors (HR, 1.70; 95% CI, 0.66-4.38). Conclusions: Migraines and persistent VMS jointly associate with greater risk for CVD and stroke, although risk is attenuated with adjustment for traditional CVD risk factors.

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**The association of depressive symptoms and female sexual functioning in the menopause transition: a cross-sectional study**

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Objective: Sexual dysfunction is very common among middle-aged females. Several factors are considered to influence sexual functioning, including reproductive aging and associated physiological changes as well as life stressors, mental health, and other socioeconomic influences. The objectives of this study are to evaluate the effect of current depressive symptoms on sexual functioning during menopause and to further analyze whether socioeconomic status, age, and antidepressant usage impact this association. Methods: Perimenopausal and postmenopausal women aged 40 to 65 years seeking treatment from a specialized menopause clinic completed a self-report survey with the main outcome measure being the 19-item Female Sexual Function Index quantifying sexual dysfunction. We used the 10-item Center for Epidemiological Studies Depression Scale to estimate a major depressive episode. Statistical analyses were completed to assess the potential associations of socioeconomic factors, age, and antidepressant usage. Results: Of the 269 participants, 61.3% met criteria for a major depressive episode and 67.0% had low sexual function. As predicted, women currently experiencing depressive symptoms had a greater risk of low sexual function during perimenopause and postmenopause. Antidepressant usage, low household income, being postmenopausal, and age also predicted low sexual function. Conclusions: Among perimenopausal and postmenopausal women, current depressive symptoms were associated with low sexual function. A biopsychosocial approach should be considered when exploring effective treatment strategies for sexual concerns among midlife women.