Selección de Resúmenes de Menopausia

Semana del 28 de agosto al 3 de septiembre de 2019

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Lancet. 2019 Aug 29. pii: S0140-6736(19)31709-X. doi: 10.1016/S0140-6736(19)31709-X. [Epub ahead of print]

Type and timing of menopausal hormone therapy and breast cancer risk: individual participant meta-analysis of the worldwide epidemiological evidence.

Collaborative Group on Hormonal Factors in Breast Cancer.

BACKGROUND: Published findings on breast cancer risk associated with different types of menopausal hormone therapy (MHT) are inconsistent, with limited information on long-term effects. We bring together the epidemiological evidence, published and unpublished, on these associations, and review the relevant randomised evidence. METHODS: Principal analyses used individual participant data from all eligible prospective studies that had sought information on the type and timing of MHT use; the main analyses are of individuals with complete information on this. Studies were identified by searching many formal and informal sources regularly from Jan 1, 1992, to Jan 1, 2018. Current users were included up to 5 years (mean 1·4 years) after last-reported MHT use. Logistic regression yielded adjusted risk ratios (RRs) comparing particular groups of MHT users versus never users. FINDINGS: During prospective follow-up, 108 647 postmenopausal women developed breast cancer at mean age 65 years (SD 7); 55 575 (51%) had used MHT. Among women with complete information, mean MHT duration was 10 years (SD 6) in current users and 7 years (SD 6) in past users, and mean age was 50 years (SD 5) at menopause and 50 years (SD 6) at starting MHT. Every MHT type, except vaginal oestrogens, was associated with excess breast cancer risks, which increased steadily with duration of use and were greater for oestrogen-progestagen than oestrogen-only preparations. Among current users, these excess risks were definite even during years 1-4 (oestrogen-progestagen RR 1·60, 95% CI 1·52-1·69; oestrogen-only RR 1·17, 1·10-1·26), and were twice as great during years 5-14 (oestrogen-progestagen RR 2·08, 2·02-2·15; oestrogen-only RR 1·33, 1·28-1·37). The oestrogen-progestagen risks during years 5-14 were greater with daily than with less frequent progestagen use (RR 2·30, 2·21-2·40 vs 1·93, 1·84-2·01; heterogeneity p<0·0001). For a given preparation, the RRs during years 5-14 of current use were much greater for oestrogen-receptor-positive tumours than for oestrogen-receptor-negative tumours, were similar for women starting MHT at ages 40-44, 45-49, 50-54, and 55-59 years, and were attenuated by starting after age 60 years or by adiposity (with little risk from oestrogen-only MHT in women who were obese). After ceasing MHT, some excess risk persisted for more than 10 years; its magnitude depended on the duration of previous use, with little excess following less than 1 year of MHT use. INTERPRETATION: If these associations are largely causal, then for women of average weight in developed countries, 5 years of MHT, starting at age 50 years, would increase breast cancer incidence at ages 50-69 years by about one in every 50 users of oestrogen plus daily progestagen preparations; one in every 70 users of oestrogen plus intermittent progestagen preparations; and one in every 200 users of oestrogen-only preparations. The corresponding excesses from 10 years of MHT would be about twice as great.

Am J Obstet Gynecol. 2019 Aug 29. doi: 10.1016/j.ajog.2019.08.043. [Epub ahead of print]

Management of Genitourinary Syndrome of Menopause in Female Cancer Patients: A Focus on Vaginal Hormonal Therapy.

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Genitourinary syndrome of menopause is a condition describing the hypoestrogenic effects on the female genitals and lower urinary tract leading to symptoms such as vaginal dryness, vulvar and vaginal burning, dyspareunia and dysuria. Genitourinary syndrome of menopause is experienced by over half of postmenopausal women, and is even more pervasive in women with cancer. Due to treatments such as surgery, chemotherapy, radiation, and hormonal therapy, women may experience early menopause resulting in earlier and more severe symptoms. Understanding the scope of this issue in female breast and gynecologic cancer survivors and identifying treatment options for this complex patient population are paramount. Tailored patient treatments include nonhormonal therapies (vaginal moisturizers, lubricants, pelvic floor physical therapy, dilator therapy, counseling), systemic and local hormonal therapies. Consensus recommendations by medical societies and associated evidence are reviewed, with emphasis on safety and efficacy of local vaginal hormonal therapies, and management variations noted depending on cancer type and characteristics. With knowledge and understanding of the unmet need associated with under-recognition and under-treatment of

genitourinary syndrome of menopause, providers caring for women with cancer are in a position to improve the quality of life of their patients by providing safe and effective treatments.

Cancer Causes Control. 2019 Aug 30. doi: 10.1007/s10552-019-01223-w. [Epub ahead of print]

World Cancer Research Fund International: Continuous Update Project-systematic literature review and meta-analysis of observational cohort studies on physical activity, sedentary behavior, adiposity, and weight change and breast cancer risk.

Chan DSM1, Abar L2, Cariolou M2, Nanu N2, Greenwood DC3, Bandera EV4, McTiernan A5, Norat T2.

PURPOSE: The purpose of the present study was to systematically review the complex associations between energy balance-related factors and breast cancer risk, for which previous evidence has suggested different associations in the life course of women and by hormone receptor (HR) status of the tumor. METHODS: Relevant publications on adulthood physical activity, sedentary behavior, body mass index (BMI), waist and hip circumferences, waist-to-hip ratio, and weight change and pre- and postmenopausal breast cancer risk were identified in PubMed up to 30 April 2017. Random-effects meta-analyses were conducted to summarize the relative risks across studies. RESULTS: One hundred and twenty-six observational cohort studies comprising over 22,900 premenopausal and 103,000 postmenopausal breast cancer cases were meta-analyzed. Higher physical activity was inversely associated with both pre- and postmenopausal breast cancers, whereas increased sitting time was positively associated with postmenopausal breast cancer. Although higher early adult BMI (ages 18-30 years) was inversely associated with pre- and postmenopausal breast cancers, adult weight gain and greater body adiposity increased breast cancer risk in postmenopausal women, and the increased risk was evident for HR+ but not HR- breast cancers, and among never but not current users of postmenopausal hormones. The evidence was less consistent in premenopausal women. There were no associations with adult weight gain, inverse associations with adult BMI (study baseline) and hip circumference, and non-significant associations with waist circumference and waist-to-hip ratio that were reverted to positive associations on average in studies accounting for BMI. No significant associations were observed for HR-defined premenopausal breast cancers. CONCLUSION: Better understanding on the impact of these factors on pre- and postmenopausal breast cancers and their subtypes along the life course is needed.

PLoS One. 2019 Aug 30;14(8):e0221690. doi: 10.1371/journal.pone.0221690. eCollection 2019.

Decline in telomere length by age and effect modification by gender, allostatic load and comorbidities in National Health and Nutrition Examination Survey (1999-2002).

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BACKGROUND: This study aims to assess the decline in telomere length (TL) with age and evaluate effect modification by gender, chronic stress, and comorbidity in a representative sample of the US population. METHODS: Cross-sectional data on 7826 adults with a TL measurement, were included from the National Health and Nutrition Examination Survey, years 1999-2002. The population rate of decline in TL across 10-year age categories was estimated using crude and adjusted regression. RESULTS: In an adjusted model, the population rate of decline in TL with age was consistent and linear for only three age categories: 20-29 (β = -0.0172, 95% CI: -0.0342, -0.0002), 50-59 (β = -0.0182, 95% CI: -0.0311, -0.0054) and 70-79 (β = -0.0170, 95% CI: -0.0329, -0.0011) years. The population rate of decline in TL with age was significantly greater for males and those with high allostatic load and a history of comorbidities. When the population rate of decline in TL was analyzed by gender in 10-year age bins, a fairly consistent yet statistically non-significant decline for males was observed; however, a trough in the rate was observed for females in the age categories 20-29 years (β = -0.0284, 95% CI: -0.0464, -0.0103) and 50-59 years (β = -0.0211, 95% CI: -0.0391, -0.0032). To further elucidate the gender difference observed in the primary analyses, secondary analyses were conducted with reproductive and hormonal status; a significant inverse association was found between TL and parity, menopause, and age at menopause. CONCLUSIONS: TL was shorter with increasing age and this decline was modified by gender, chronic stress and comorbidities; individuals with chronic morbidity and/or chronic stress and females in their twenties and fifties experienced greater decline. Female reproductive factors, i.e., parity and menopause, were associated with TL.

Eur J Clin Pharmacol. 2019 Aug 29. doi: 10.1007/s00228-019-02743-9. [Epub ahead of print]

Drug-induced osteoporosis/osteomalacia: analysis in the French and Spanish pharmacovigilance databases.

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INTRODUCTION: Osteomalacia and osteoporosis are two metabolic bone disorders that increase the risk of fracture due to several causes. In terms of drugs, apart from corticosteroids, which are known to induce bone disorders, several other drugs used in chronic disease management have also been linked with an increased risk of osteoporosis and osteomalacia. PURPOSE: The aim of this study was to describe spontaneous reports of drug-induced osteoporosis and osteomalacia in the French (FPVDB) and Spanish (SPVDB) pharmacovigilance databases. METHODS: Data were provided by the FPVDB and SPVDB. All reports of osteoporosis and osteomalacia recorded from 1985 up to 31 December 2015 inclusive were selected. Taking the time to onset of bone loss into account, all cases occurring in less than 1 month were excluded. RESULTS: A total of 369 reports (44 cases of osteomalacia, 325 cases of osteoporosis) were registered in the FPVDB and 64 (22 cases of osteomalacia, 42 cases of osteoporosis) in the SPVDB. In France, the top 5 drugs involved in the onset of osteoporosis were corticosteroids accounting for approximately half of the reports (n = 170) followed by systemic antiviral (n = 87), antacid (n = 29), antiepileptic (n = 27) and antithrombotic (n = 24) drugs. The 2 main classes of drugs implicated in osteomalacia were systemic antiretroviral drugs for half of the reports (n = 21) and antiepileptic drugs (n = 15). In Spain, corticosteroids were involved in 35.7% of reported cases of osteoporosis (n = 15) followed by systemic antiviral drugs (n = 12). There was no spontaneous report for antacid drugs. For osteomalacia, the 2 main drug classes were systemic antiretroviral drugs (n = 18, 81.8%) followed by antiepileptics (n = 2, 9.0%). In both countries, concomitant administration of systemic corticosteroids with other suspected drugs did not significantly modify the time to onset of drug-induced osteoporosis. CONCLUSION: Despite some differences between the French and Spanish PVDBs, our data consistently show that bone loss is not only restricted to glucocorticoids but also involves antivirals, antiepileptic drugs, antacid drugs or antidepressants. Further analysis might prove useful in exploring the characteristics of drug-induced bone loss on a larger scale.

Comput Struct Biotechnol J. 2019 Jul 22;17:1101-1112. doi: 10.1016/j.csbj.2019.07.005. eCollection 2019.

High Versus low Dietary Protein Intake and Bone Health in Older Adults: a Systematic Review and Meta-Analysis.

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Protein may play a beneficial role in the prevention of bone loss and in slowing down osteoporosis. The effect of dietary protein may be different in older adults compared to younger adults, since this population has a greater need for protein. The aim of this systematic review and meta-analysis was to investigate the impact of a dietary protein intake above the Recommended Dietary Allowance (RDA) of 0.8 g/kg body weight/day from any source on Bone Mineral Density (BMD)/Bone Mineral Content (BMC), bone turnover markers, and fracture risk in older adults compared to a lower dietary protein intake. A systematic search was conducted through October 2018 in 3 databases: CENTRAL, MEDLINE, and EMBASE. We included all prospective cohort studies and Randomized Controlled Trials (RCTs) among adults aged ≥65 years that examined the relation between protein intake on bone health outcomes. Two investigators independently conducted abstract and full-text screenings, data extractions, and risk of bias assessments. Authors were contacted for missing data. After screening of 523 records, twelve cohort studies and one RCT were included. Qualitative evaluation showed a positive trend between higher protein intakes and higher femoral neck and total hip BMD. Meta-analysis of four cohort studies showed that higher protein intakes resulted in a significant decrease in hip fractures (pooled hazard ratio: 0.89; 95% confidence interval: 0.84, 0.94). This systematic review supports that a protein intake above the current RDA may reduce hip fracture risk and may play a beneficial role in BMD maintenance and loss in older adults.

JAMA Netw Open. 2019 Aug 2;2(8):e1910154. doi: 10.1001/jamanetworkopen.2019.10154.

Association Between Hormone Therapy and Muscle Mass in Postmenopausal Women: A Systematic Review and Meta-analysis.

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Hormone therapy (HT) has been suggested for protection against age-related muscle weakness in women. However, the potential for HT-associated health risks necessitates a better understanding of the direction and magnitude of the association between HT and health outcomes, such as lean body mass (LBM). Objective:To determine whether HT

was associated with reduced LBM loss compared with not receiving HT among postmenopausal women aged 50 years and older. Data Sources: MEDLINE, Embase, AgeLine, CINAHL, and SportDiscus (searched from inception until April 25, 2018). Study Selection: For this systematic review and meta-analysis, randomized clinical trials including postmenopausal women undergoing HT and control groups of women not receiving HT were selected by 2 reviewers. Studies were included if LBM or fat-free mass were measured as an outcome. Studies with participants from hospitals, long-term care facilities, or with specific diseases were excluded. Data Extraction and Synthesis: Information regarding study characteristics and outcome measures were extracted by 1 reviewer and verified by another. Risk of bias was evaluated. Quality of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines were used to abstract data and assess data quality/validity. Data were pooled using a fixed-effects model. Main Outcomes and Measures: The primary study outcome was the overall absolute change in LBM (measured in kilograms), captured by dual-energy x-ray absorptiometry, dual-photon absorptiometry, or bioelectrical impedance analysis imaging. Results: Of 8961 studies that met selection criteria, 12 were included, with a total of 4474 recruited participants. Of the participants, mean (SD) age was 59.0 (6.1) years. Data on ethnicity were collected by 2 of the studies. Of the 22 HT intervention arms, 15 used estrogen-progesterone combination HT and 7 used estrogen-only HT. Control participants were women who received no HT at all or who received placebo. The median follow-up duration was 2 years (range, 6 months to 6 years). Seven treatment arms showed a loss of LBM, and 14 were protective. Overall, HT users lost 0.06 kg (95% CI, -0.05 to 0.18) less LBM compared with control participants, but the difference was not statistically significant (P = .26). The results were unchanged when stratified based on treatment type and dosage, duration of follow-up, time since menopause, study quality, and type of LBM measurement, with HT users losing between 0.06 kg more to 0.20 kg less LBM compared with control participants for all strata. The quality of evidence based on GRADE was low. Conclusions and Relevance: This systematic review and meta-analysis did not show a significant beneficial or detrimental association of HT with muscle mass. Although muscle retention in aging women is of crucial importance, these findings suggest that interventions other than HT should be explored.

Menopause. 2019 Aug 26. doi: 10.1097/GME.0000000000001392. [Epub ahead of print]

Association between obesity type and obstructive coronary artery disease in stable symptomatic postmenopausal women: data from the KoRean wOmen'S chest pain rEgistry (KoROSE).

Cho JH1, Kim HL1, Kim MA1, Oh S3, Kim M4, Park SM4, Yoon HJ5, Shin MS6, Hong KS7, Shin GJ8, Shim WJ4.

OBJECTIVES: This study investigated the association between obesity type and obstructive coronary artery disease (CAD) in postmenopausal women. METHODS: Study data were obtained from a nation-wide registry, composed of 659 women older than 55 years with chest pain undergoing elective invasive coronary angiography in the suspicion of CAD. Obstructive CAD was defined as angiographic findings of ≥50% diameter stenosis with any major epicardial coronary artery. Overall obesity was defined as a body mass index of ≥25 kg/m, and central obesity was defined as a waist circumference of ≥85 cm. RESULTS: A total of 311 women (47.2%) had obstructive CAD. The incidence of overall obesity was not different between participants with and without obstructive CAD (P=0.340), but the prevalence of obstructive CAD was significantly higher in participants with central obesity than those without (55.5% vs 41.0%, P<0.001). There was no significant difference in body mass index between participants with and without obstructive CAD (P=0.373). Multivariable analysis showed that central obesity was associated with obstructive CAD even after controlling for potential confounders (odds ratio, 1.61; 95% confidence interval, 1.10-2.34; P=0.013). However, overall obesity was not associated with obstructive CAD in the same multivariable analysis (P=0.228). CONCLUSIONS: Central obesity but not overall obesity is associated with obstructive CAD in postmenopausal women with stable chest pain undergoing invasive coronary angiography.

Cancer Epidemiol Biomarkers Prev. 2019 Aug 27. doi: 10.1158/1055-9965.EPI-19-0554. [Epub ahead of print]

Menopausal hormone therapy and risk of melanoma: a nationwide register-based study in Finland.

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BACKGROUND: The association between use of menopausal hormone therapy (HT) and risk of cutaneous melanoma (CM) is highly debated. We investigated the issue in a Finnish nationwide cohort of women aged 50 years or more. METHODS: All women who had purchased HT between 1994 and 2007 were identified from the national Medical

Reimbursement Registry and linked to the Finnish Cancer Registry. We calculated standardized incidence ratios (SIR) to compare incidence of CM among HT users to that of the general population. RESULTS: During a mean follow-up of 15.6 years, 1,695 incident CM cases were identified among 293,570 women who had used HT for at least 6 months. The SIRs for women who used unopposed estrogen therapy (ET) and combined estrogen-progestin therapy (EPT) for 6-59 months were 1.20 (95% CI 1.06-1.35) and 1.00 (95% CI 0.87-1.14; p-heterogeneity=0.04). The SIRs for women who used ET and EPT for at least 60 months were 1.37 (95% CI 1.22-1.52) and 1.23 (95% CI 1.13-1.34; p-heterogeneity=0.15). We did not find significant differences between oral and transdermal administrations, nor between doses of estrogens. CONCLUSIONS: Use of HT, especially ET, was associated with an increased risk of CM. EPT use of less than five years was not associated with an increased risk of CM. IMPACT: Our results add to the growing body of epidemiological evidence that the use of unopposed estrogens in menopause increases the risk of CM, while the addition of progestins might counteract the detrimental effect.

J Coll Physicians Surg Pak. 2019 Sep;29(9):823-827. doi: 10.29271/jcpsp.2019.09.823.

Relationship between Postmenopausal Vitamin D Level, Menopausal Symptoms and Sexual Functions.

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OBJECTIVE: To determine whether vitamin D levels correlate with menopausal symptoms and female sexual functions. STUDY DESIGN: A cross-sectional study. PLACE AND DURATION OF STUDY: Izmir Katip Celebi University Hospital, Izmir, Turkey, between February and October 2017. METHODOLOGY: Menopausal and sexual active ladies aged 40-70 years were inducted. Those with psychiatric disorders, endocive abnormalities, related therapy, and malignancy were excluded. Menopause Rating Scale (MRS), and the Female Sexual Function Index (FSFI) were used to collect data. Also blood samples were collected from the patients. The study's data were examined with logistic and linear regression models. RESULTS: Total MRS scale scores of the 303 subjects with one of the following conditions had a higher menopause symptom score; chronic disease, vaginal discharge, chronic pain, unsatisfied with sex, sleep problems, and low vitamin D level ($p=0.023$, $p=0.007$, $p<0.001$, $p<0.001$, $p=0.017$, and $p<0.001$; respectively). It was found that those who have middle income level were more likely to have better sexual function (OR: 0.209, 95% CI: 0.065; 0.671) compared to those who have low income level. It was found that those with higher MRS somatic complaint (OR: 1.274; 95% CI: 1.087; 1.494) and urogenital complaint (OR: 1.670; 95% CI: 1.326; 2.102) and ones with lower vitamin D levels (OR: 0.963; %95 CI: 0.941; 0.987) were more likely to report complaints for sexual function disorders. CONCLUSION: Vitamin D of all women in menopause should be evaluated. High vitamin D levels should reduce menopausal symptoms and positively affect sexual function.

JAMA. 2019 Aug 27;322(8):736-745. doi: 10.1001/jama.2019.11889.

Effect of High-Dose Vitamin D Supplementation on Volumetric Bone Density and Bone Strength: A Randomized Clinical Trial.

Burt LA1, Billington EO1, Rose MS2, Raymond DA1, Hanley DA1, Boyd SK1.

Few studies have assessed the effects of daily vitamin D doses at or above the tolerable upper intake level for 12 months or greater, yet 3% of US adults report vitamin D intakes of at least 4000 IU per day. Objective: To assess the dose-dependent effect of vitamin D supplementation on volumetric bone mineral density (BMD) and strength. Design, Setting, and Participants: Three-year, double-blind, randomized clinical trial conducted in a single center in Calgary, Canada, from August 2013 to December 2017, including 311 community-dwelling healthy adults without osteoporosis, aged 55 to 70 years, with baseline levels of 25-hydroxyvitamin D (25[OH]D) of 30 to 125 nmol/L. Interventions: Daily doses of vitamin D3 for 3 years at 400 IU (n = 109), 4000 IU (n = 100), or 10 000 IU (n = 102). Calcium supplementation was provided to participants with dietary intake of less than 1200 mg per day. Main Outcomes and Measures: Co-primary outcomes were total volumetric BMD at radius and tibia, assessed with high resolution peripheral quantitative computed tomography, and bone strength (failure load) at radius and tibia estimated by finite element analysis. Results: Of 311 participants who were randomized (53% men; mean [SD] age, 62.2 [4.2] years), 287 (92%) completed the study. Baseline, 3-month, and 3-year levels of 25(OH)D were 76.3, 76.7, and 77.4 nmol/L for the 400-IU group; 81.3, 115.3, and 132.2 for the 4000-IU group; and 78.4, 188.0, and 144.4 for the 10 000-IU group. There were significant group × time interactions for volumetric BMD. At trial end, radial volumetric BMD was lower for the 4000 IU group (-3.9 mg HA/cm3 [95% CI, -6.5 to -1.3]) and 10 000 IU group (-7.5 mg HA/cm3 [95% CI, -10.1 to -5.0]) compared with the 400 IU group with mean percent change in volumetric BMD of -1.2% (400 IU group), -

2.4% (4000 IU group), and -3.5% (10 000 IU group). Tibial volumetric BMD differences from the 400 IU group were -1.8 mg HA/cm3 (95% CI, -3.7 to 0.1) in the 4000 IU group and -4.1 mg HA/cm3 in the 10 000 IU group (95% CI, -6.0 to -2.2), with mean percent change values of -0.4% (400 IU), -1.0% (4000 IU), and -1.7% (10 000 IU). There were no significant differences for changes in failure load (radius, P = .06; tibia, P = .12). Conclusions and Relevance: Among healthy adults, treatment with vitamin D for 3 years at a dose of 4000 IU per day or 10 000 IU per day, compared with 400 IU per day, resulted in statistically significant lower radial BMD; tibial BMD was significantly lower only with the 10 000 IU per day dose. There were no significant differences in bone strength at either the radius or tibia. These findings do not support a benefit of high-dose vitamin D supplementation for bone health; further research would be needed to determine whether it is harmful.

Menopause. 2019 Sep;26(9):1071-1084. doi: 10.1097/GME.0000000000001326.

The Kronos Early Estrogen Prevention Study (KEEPS): what have we learned?

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OBJECTIVE: The Kronos Early Estrogen Prevention Study (KEEPS) was designed to address gaps in understanding the effects of timely menopausal hormone treatments (HT) on cardiovascular health and other effects of menopause after the premature termination of the Women's Health Initiative. METHOD: The KEEPS was a randomized, double-blinded, placebo-controlled trial to test the hypothesis that initiation of HT (oral conjugated equine estrogens [o-CEE] or transdermal 17β-estradiol [t-E2]) in healthy, recently postmenopausal women (n=727) would slow the progression of atherosclerosis as measured by changes in carotid artery intima-media thickness (CIMT). RESULTS:
After 4 years, neither HT affected the rate of increase in CIMT. There was a trend for reduced accumulation of coronary artery calcium with o-CEE. There were no severe adverse effects, including venous thrombosis. Several ancillary studies demonstrated a positive effect on mood with o-CEE, and reduced hot flashes, improved sleep, and maintenance of bone mineral density with both treatments. Sexual function improved with t-E2. There were no significant effects of either treatment on cognition, breast pain, or skin wrinkling. Variants of genes associated with estrogen metabolism influenced the age of menopause and variability in effects of the HT on CIMT. Platelet activation associated with the development of white matter hyperintensities in the brain. CONCLUSIONS: KEEPS and its ancillary studies have supported the value and safety of the use of HT in recently postmenopausal women and provide a perspective for future research to optimize HT and health of postmenopausal women. The KEEPS continuation study continues to pursue these issues.

Menopause. 2019 Sep;26(9):1024-1030. doi: 10.1097/GME.0000000000001348.

High risk for cardiovascular disease in postmenopausal breast cancer survivors.

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OBJECTIVE: Breast cancer patients have a higher mortality risk of cardiovascular disease (CVD) than women from the general population. CVD risk may increase significantly in postmenopausal women with early-stage breast cancer. The aim of this study was to evaluate risk factors for CVD in postmenopausal breast cancer survivors. METHODS: In this cross-sectional study, 96 postmenopausal breast cancer survivors were compared with 192 postmenopausal women. The main group included women with amenorrhea >12 months, aged ≥45 years, with breast cancer, and without established CVD. The control group fulfilled the same criteria, but did not have breast cancer. Groups were matched by age, time since menopause, and body mass index, in a ratio of 1 case to 2 controls (1:2). Women with three or more of the following criteria were diagnosed with metabolic syndrome: waist circumference >88 cm; triglycerides ≥150 mg/dL; high-density lipoprotein cholesterol <50 mg/dL; blood pressure ≥130/85 mm Hg; and glucose ≥100 mg/dL. Immunoassays were used (enzyme-linked immunosorbent assay test) for measurement of plasma heat shock proteins (HSP) 60 and 70 concentrations. Atherosclerotic disease was determined by intima-media thickness (>1 mm) of the carotid arteries and/or the presence of atheromatous plaque assessed by carotid artery ultrasound (scanner duplex). RESULTS: Breast cancer patients had higher HSP60 levels and lower HSP70 levels than controls (P<0.05). Analysis showed that the odds of developing metabolic syndrome (odds ratio [OR]=4.21, 95% CI, 2.28-7.76), atheromatous plaque (OR=2.61, 95% CI, 1.19-5.72), diabetes (OR=4.42; 95% CI, 1.86-10.49), hypertriglyceridemia (OR=2.32, 95% CI, 1.33-4.0), and increased waist circumference (OR=11.22, 95% CI, 4.0-31.65) was significantly higher in women treated for cancer than in women without breast cancer. CONCLUSIONS: Postmenopausal breast cancer survivors had a stronger association with risk factors for cardiovascular disease than postmenopausal women without breast cancer.