Selección de Resúmenes de Menopausia

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Long-term effects of premenopausal risk-reducing salpingo-oophorectomy on bone mineral density

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Women at high familial risk for ovarian cancer are recommended to undergo risk-reducing salpingo-oophorectomy (RRSO), leading to surgical menopause and short-term bone loss. However, long-term studies and osteoporosis screening recommendations are lacking. Eighteen years after premenopausal RRSO, women had lower bone mineral density compared with women who underwent a postmenopausal RRSO. Purpose: To prevent ovarian cancer, BRCA1/2 germline pathogenic variant carriers are recommended to undergo premenopausal risk-reducing salpingo-oophorectomy (RRSO). Premenopausal RRSO leads to immediate menopause, which has been associated with an acute phase of rapid bone loss. However, data on long-term bone mineral density (BMD) is scarce and inconclusive. We aimed to investigate long-term BMD after premenopausal RRSO. Methods: We conducted a cross-sectional study nested in a nationwide cohort of women at high familial risk of ovarian cancer. We compared 493 women who underwent premenopausal RRSO (≤ 45 years) with 228 women who underwent postmenopausal RRSO (≥ 54 years). BMD was assessed by Dual-Energy X-ray absorptiometry of the lumbar spine (LS) and femoral neck (FN). Age differences between the pre- and postmenopausal RRSO groups were accounted for using Z-scores. Results: Median age at study visit was 59.2 years in the premenopausal RRSO group and 69.7 years in the postmenopausal RRSO group (P < 0.001), median time since premenopausal RRSO was 18.1 years (IQR 15.3-21.3). In multivariable regression analyses the BMD Z-scores of the LS and FN were significantly lower for the premenopausal compared with the postmenopausal RRSO group (β -0.88, 95% CI, -1.10,-0.66 for LS; β -0.51, 95% CI, -0.71,-0.31 for FN). Relative risks (RRs) of having a Z-score ≤ -1.0 were also higher in the premenopausal compared with the postmenopausal RRSO group (RR 2.35, 95% CI, 1.26-4.40 and RR 1.84, 95% CI, 1.08-3.13, respectively). Conclusion: Premenopausal RRSO appears to be associated with long-term lowering of BMD Z-scores, emphasizing the importance of counseling women about bone health after premenopausal RRSO.

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Mitochondrial dysfunction in perimenopausal mood disorders: From hormonal shifts to neuroenergetic failure

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Perimenopause represents a key transition from a reproductive to non-reproductive state in women, characterized by physiological and psychological changes. Mood disturbances during this period, such as depression, anxiety and cognitive decline, are increasingly understood as complex neuroendocrine and metabolic disorders. Mitochondrial homeostasis carries out a key role in the pathophysiology of these affective symptoms. Disruptions in mitochondrial biogenesis, mitophagy and calcium regulation contribute to synaptic dysfunction and neuroimmune changes. These mitochondrial alterations interact with inflammatory pathways and hormonal signals, exacerbating neuropsychiatric symptoms. A more comprehensive understanding of the molecular mechanisms of mitochondrial dysfunction in menopausal mood disorders unveils potential therapeutic strategies, including mitochondria-targeted antioxidants, hormone replacement therapy, and lifestyle interventions designed to restore mitochondrial integrity and cerebral bioenergetic function.

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Topical Estradiol Gel Leading to Laboratory Error in Serum Estradiol Measurement: A Diagnostic Pitfall

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Estradiol gel is commonly used as an estrogen replacement therapy for patients with menopausal symptoms. Herein, we present a case of a patient with iatrogenic primary ovarian insufficiency who exhibited an abnormally elevated serum estradiol concentration (5634.0 pg/mL) during routine estradiol monitoring. A detailed interview revealed that the cause of these elevated levels was contamination of the needle used to draw her blood with gel from her skin. To the best of our knowledge, this is the first report of estradiol concentrations exceeding 2000 pg/mL due to such contamination. This phenomenon is not well known and is not described in package inserts or guidelines. There is a risk that misleadingly high serum estradiol concentrations may lead to inappropriate dose adjustments, potentially negatively affecting the health of the patients. Thus, clinicians must provide precise instructions to patients to avoid applying the gel around the area where venipuncture is to be performed.

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Diet, oxidative stress, and the mediating role of obesity in postmenopausal women

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Background: Oxidative stress plays a critical role in age-related pathophysiology, and postmenopausal women are particularly vulnerable due to hormonal and metabolic changes. Although dietary quality has been implicated in modulating oxidative balance, few studies have explored whether obesity mediates this relationship in this population, representing a novel perspective in dietary-oxidative research. Objectives: This study aimed to examine the associations between dietary quality and oxidative stress among postmenopausal women using data from the National Health and Nutrition Examination Survey (NHANES), and to assess whether obesity mediates this relationship. Methods: A total of 2,391 postmenopausal women from NHANES 2005–2020 were included. Dietary quality was assessed using the Healthy Eating Index (HEI-2015), Dietary Inflammatory Index (DII), and Composite Dietary Antioxidant Index (CDAI). Oxidative stress was measured using the Oxidative Balance Score (OBS), and obesity was evaluated by body mass index and waist circumference. Multivariable regression and mediation analysis were conducted to explore the relationships. Results: Healthier diets (higher HEI and CDAI, lower DII) were significantly associated with better oxidative profiles and lower obesity indicators. Obesity was inversely associated with oxidative stress. Mediation analysis showed that obesity partially explained the association between diet and oxidative stress, indicating an indirect pathway linking dietary quality to oxidative status via adiposity. Conclusions: Our findings reveal a significant mediating role of obesity in the relationship between diet and oxidative stress in postmenopausal women. These results underscore the importance of integrated dietary and weight management strategies—such as promoting antioxidant-rich diets and obesity prevention—in mitigating oxidative stress-related health risks in this population.

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New Perspectives on the Use of Resveratrol in the Treatment of Metabolic and Estrogen-Dependent Conditions Through Hormonal Modulation and Anti-Inflammatory Effects

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Estrogen-dependent conditions, such as endometriosis, adenomyosis, lipedema, polycystic ovary syndrome, and breast cancer, are intimately involved with hormonal changes related to estrogen and their receptors. These conditions can be expressed mainly during hormonal changes such as pregnancy, puberty, and menopause. They are associated with alterations in estrogen function and inflammatory mechanisms, leading to significant discomfort and a marked decrease in self-esteem in women. Resveratrol has been studied in the treatment of inflammatory diseases like obesity, metabolic syndrome, and endometriosis. The research suggests potential pathways through which resveratrol may also be beneficial in treating metabolic and estrogen-dependent conditions. We reviewed 63 articles from 2000 to 2025, prioritizing systematic reviews, meta-analyses, and randomized controlled trials in the PubMed, ScienceDirect, and SciELO databases. Our results suggest that resveratrol may benefit metabolic and estrogen-dependent conditions by modulating anti-inflammatory factors that regulate estrogen receptor activity, increasing lipolysis, decreasing insulin resistance, and mitigating oxidative stress. Future research should evaluate the long-term safety and potential therapeutic effects of resveratrol in metabolic conditions.

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Reproductive aging in biological females: mechanisms and immediate consequences

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Reproductive aging is a dynamic, systemic process that encompasses more than the decline in ovarian function. It involves coordinated changes across neuroendocrine, immune, metabolic, and mitochondrial systems. Central to this transition is the depletion of ovarian follicles, leading to reduced estradiol and progesterone production and subsequent disruption of the hypothalamic-pituitary-gonadal (HPG) axis. This hormonal shift remodels hypothalamic signaling networks - particularly those involving kisspeptin, neurokinin B (NKB), and GABA - driving alterations in gonadotropin-releasing hormone (GnRH) pulsatility, vasomotor symptoms (VMS), and loss of reproductive cycling. Simultaneously, chronic inflammation, oxidative stress, and mitochondrial dysfunction further accelerate both ovarian and neural aging. Estrogen receptor subtypes (ERα and ERβ) play critical and region-specific roles in mediating tissue responses to hormonal withdrawal, contributing to variability in symptom expression and therapeutic outcomes. Genetic, cultural, and environmental factors - such as diet, endocrine disruptors, and APOE genotype - further influence the trajectory and severity of menopause-related changes. Emerging treatments, including neurokinin receptor antagonists and ERβ-selective modulators, offer targeted alternatives to conventional hormone therapy. This review frames menopause not as a singular endocrine endpoint but as a neuroimmune transition, highlighting the need for mechanistic insight and personalized therapeutic approaches to improve health outcomes during reproductive aging.

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Vaginal Lactobacillus Alteration and Vaginal Symptom Relief After Carbon Dioxide Vaginal Laser Therapy in Postmenopausal Women

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Objective: To assess changes in the prevalence and abundance of vaginal Lactobacillus after fractional micro-ablative carbon dioxide (CO2) therapy in postmenopausal women with vulvovaginal atrophy (VVA). Methods: This prospective, single-arm clinical study was conducted in postmenopausal women who underwent treatment with CO2 laser therapy. Eligible participants were enrolled before the first session of therapy and evaluated at weeks 0, 8, 20, and 32. Vaginal fluid samples were collected using a standardized protocol and processed for Gram staining and expanded quantitative urine culture (EQUC). The level of Lactobacillus was assessed using the Nugent scoring system. The secondary outcomes included the prevalence of Lactobacillus, VVA symptoms, and vaginal pH. The results were analyzed using multilevel mixed-effects linear regression and paired t-tests. Results: Forty-three postmenopausal women with at least one symptom of VVA, with a mean age of 67.3 ± 8.7 years, were recruited. The mean Nugent scores for Lactobacillus morphotypes gradually decreased from 2.84 (95% CI: 2.38-3.29) at baseline to 2.28 (95% CI: 1.79-2.77) at week 8, 2.09 (95% CI: 1.60-2.58) at week 20, and further to 1.84 (95% CI: 1.31-2.35) at week 32 ($p < 0.05$). The prevalence of Lactobacillus increased from 27.9% (12/43) at baseline to 48.8% (21/43) at week 8, 55.8% (24/43) at week 20, and 58.1% (25/43) at week 32 ($p < 0.05$). VVA symptom severity and vaginal pH consistently declined from baseline to week 32 ($p < 0.05$). Conclusion: Fractional CO2 laser treatment improved the prevalence and level of Lactobacillus after treatment and sustained improvements were observed at 3- and 6-month follow-ups. These positive effects were correlated with improvements in VVA symptoms.