Title

Serum Estradiol Is Associated With Kyphosis in Older Men: The MrOS Study

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2014 IOF-ISCD Skeletal Health Meeting Abstracts

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Abstracts Selected for Oral Presentation

O01

COMPARISON OF VISCERAL ADIPOSE TISSUE MEASURED BY DXA AND MRI, AND ASSOCIATIONS WITH BLOOD BIOMARKERS

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Aims: Visceral adipose tissue (VAT) has been distinctly linked to several pathological conditions, including impaired glucose and lipid metabolism and insulin resistance. Visceral adiposity can be directly measured using 3D imaging techniques, specifically computed tomography (CT) and magnetic resonance image (MRI). These methods are regarded as the gold standards. However, their use is limited due to cost, availability and radiation or magnetic safety. Recently, a new method, dual-energy X-ray absorptiometry (DXA), was introduced to estimate VAT from whole body DXA scans.
We investigated the comparability of VAT measured by MRI (MRI-VAT) and DXA (DXA-VAT), and to further investigate the association of VAT with obesity-related biological markers.
Methods: Sixty healthy postmenopausal women, 60-65 years old, of Caucasian or Japanese descent, were recruited among participants in the Multiethnic Cohort living on Oahu, Hawaii. All participants underwent anthropometric measurements (height, weight and waist and hip circumferences), a whole body DXA scan (GE-Lunar Prodigy, Madison, WI) and a fasting blood collection, and 48 women also received an abdominal MRI (3 Tesla TIM Trio scanner, Siemens Medical System, Erlangen, Germany) scan. Correlations were examined between VAT measures and fasting triglycerides (TG), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), total cholesterol (Total_Chol), glucose, and insulin. Multiple regression analyses were used to examine the association of VAT measured by DXA and MRI with blood biomarkers after appropriate adjustment.
Results: Only the 48 women who received both DXA and MRI scans were included in this analysis. The majority of women were found to have metabolic markers in the normal ranges. The correlation coefficient (r) between MRI and DXA derived VAT measures was 0.73 (95% CI: 0.55 - 0.83). Regression analyses showed that both VAT measurements were significantly associated with TG, HDL-C, insulin and DXA-VAT was associated with glucose as well. The coefficients of determination (R^2) for MRI and DXA VAT were 0.23 and 0.25 for TG, 0.09 and 0.26 for HDL-C, and 0.22 and 0.27 for insulin, respectively. DXA-VAT not MRI-VAT was associated with glucose (R^2=0.20). After adjusting for BMI or Android FAT, both VAT associations with blood markers remained significant. However, after adjusting for waist circumference, only TG and glucose remained significantly associated with DXA-VAT and only TG remained significantly associated with MRI-VAT.
Conclusion: We conclude that DXA-VAT and MRI-VAT are highly correlated. The power of association of DXA-VAT with blood biomarkers might have been underestimated in this study due to small sample size and limited age range.
Disclosure of Interest: None Declared

O02

SERUM ESTRADIOL IS ASSOCIATED WITH KYPHOSIS IN OLDER MEN: THE MROS STUDY

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Aims: Hyperkyphosis, or increased thoracic spine curvature, tends to progress with age and is associated with poor physical and pulmonary function, injurious falls, and mortality. Although closely related to osteoporosis, most men with severe degrees of kyphosis do not have vertebral fractures. The underlying pathophysiology of age-related hyperkyphosis is unknown, but rat models suggest that estrogen may be an important factor.
Methods: To test the hypothesis that low sex steroid hormone levels are associated with kyphosis, we studied 996 men from the Osteoporosis Fractures in Men Study (MrOS) aged 65-99 years (mean age 72.9) who had baseline measures of total and bioavailable testosterone, total and bioavailable estradiol, sex hormone binding globulin (SHBG) and Cobb angle of kyphosis (calculated from lateral spine x-rays). Using multivariable linear regression, we examined the correlation between each sex-steroid hormone and kyphosis.
Results: Men had an average kyphosis of 38° (SD=11.3) and 4.2% had a prevalent vertebral fracture. All sex hormones were normally distributed. Men had a mean testosterone level of 423.7 ng/dL (SD=160.4), mean bioavailable testosterone of 216.9 ng/dL (SD=70.6), mean total estradiol of 18.1 pg/mL (SD=6.3), mean bioavailable estradiol of 12.3 pg/mL (SD=4.5), and mean SHBG of 48.9 nmol/L (SD=19.7). Adjusting for age and clinic site, only total and bioavailable estradiol were significantly associated with kyphosis. Further adjustment for BMI, prevalent vertebral fracture, hip BMD and degenerative disc disease did not materially change the results. In fully adjusted models, with each SD increase in bioavailable estradiol, there was a 1.16° decrease in kyphosis (95% CI -1.89, -0.43, p=0.002). Similar findings were seen with total estradiol. While there was a trend that increased SHBG was associated with increased kyphosis (p=0.10), no associations were found with testosterone. We considered additional potential confounders that included comorbidities and health behaviors such as physical activity, alcohol use, and smoking, but adjustment for these factors made no difference in our findings.
Conclusion: Confirming reports from the animal literature in a large epidemiological study, we report that older men with higher levels of total and bioavailable estradiol tend to have less kyphosis than men with lower estradiol levels. Of the sex hormones, estrogen appears to be the most important factor in determining both bone density and degree of kyphosis in older men.
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Disclosure of Interest: None Declared

O03

INFLUENCE OF GLUCOCORTICOIDS ON TRABECULAR BONE SCORE IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Aims: Bone disorders are the main extra-articular complications of rheumatoid arthritis (RA). Patients with RA have a greater risk of osteoporosis and fracture