

establish the relationship between liver structural alterations and dysfunctionality of mitochondrial complexes. Methods: male Wistar rats were used (8 per group): (A)Control, (B)MS. MS was induced by 10% fructose for 45 days. Nitric oxide ( $\mu\text{M}$ ) and superoxide dismutase (U/mL) were quantified to verify the OS state. The liver tissue was analyzed by optical microscopy(OM). The mitochondrial ultrastructure of hepatocytes was analyzed by electron microscopy (EM). The enzymatic activity ( $\mu\text{M}$ ) of citrate synthase and complexes I, II and III were quantified in liver pellets. Statistics: ANOVA, LSD Fisher and hotelling as a post hoc test, p significance level<0.05. Results: Levels of nitric oxide decreased in (B), while superoxide dismutase activity increased ( $p<0.001$ ). In (B) OM showed binucleation, periportal inflammatory infiltrate, vacuolization, and congestive blood vessels. The EM of (B) showed enlarged mitochondria with vacuolated matrix and altered ridges. The enzymatic activity of citrate synthase showed a decrease in (B) ( $p<0.01$ ), similar behavior to complex I ( $p <0.001$ ). Complex III showed increased activity in (B)( $p<0.02$ ). Conclusion: The enzymatic modifications of the mitochondrial complexes and the distortion in the normal mitochondrial architecture would indicate how the pathogenic mechanisms of NAFLD are carried out and would demonstrate how the pro-oxidative state that exists in MS triggers lesions in liver tissue.

**Keywords:** Insuline Resistance; Metabolic Syndrome, Non-Alcoholic Fatty Liver Disease; Oxidative Stress; Mitochondrial Dysfunction.

**Abbreviations:** NAFLD: Non-Alcoholic Fatty Liver Disease; MS: Metabolic Syndrome; OS: Oxidative Stress; OM: Optical Microscopy; EM: Electron Microscopy.

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## 0200

### Relationship Between Insulin Resistance and Adrenal Steroids Pattern in Women During Menopausal Transition

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#### Abstract

Recognition of rise of adrenal androgens experienced by majority of women during Menopause transition (MT) can explain diversity of female phenotypes at postmenopausal ages. Adrenal androgens may mitigate imminent future fallouts of estradiol decline. Perhaps pattern of adrenal androgens predetermines alterations in female organism after menopause including growing insulin resistance in some of them. Objectives. Our study made an attempt to collate insulin resistance index (HOMA-IR) with status of adrenal steroids in women during MT. Methods. Cross-sectional associations were examined between body mass index (BMI), hip- waist ratio (HWR), HOMA-IR and Serum content of insulin, testosterone (T), sex hormone binding globulin (SHBG), free androgen index (FAI), dehydroepiandrosterone sulfate (DHEAS), androstenedione (Adione), delta-5-androstenediol (Adiol) measured in 315 women of perimenopausal age (age range from 45 to 55 years) with amenorrhea less than 2 years. Results. It turned out that women who fell into two different subsets according to HOMA-IR (either raised HOMA-IR – 1st group, or within physiological range – 2nd

group) showed androgen profile distinctive to each group. The main significant difference was fivefold higher level of Adiol in the 2nd group, when the 1st group shows preponderance of Adione ( $p<0.05$ ). Also patients of the 2nd group proved to have lower FAI, less fasting insulin, a bit higher DHEAS, lower BMI and HWR. Conclusion. High Adiol (evidence of activated delta-5 steroidogenic pathway, ethnicity-specific or inherited) provides the ground for physiological course of MT. Excessive androgen activity (Adione – probably ensued from overactivated delta 4/5 isomerase pushing delta-5 hormones to turn into delta-4 ones; T, low SHBG, higher FAI) may incur insulin resistance, android obesity. Stressful excessive cortisol production devastates resources for DHEAS rise and adrenal androgens.

**Keywords:** menopausal transition, adrenal steroids, insulin resistance

**Abbreviations:** Menopause transition (MT), HOMA-IR, FAI (free androgen index), DHEAS (dehydroepiandrosterone sulfate), BMI (body mass index), HWR (hip-waist ratio).

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## 0201

### Association Between Vitamin D Deficiency and Overweight/Obesity in a Sample of Non- Diabetic Euthyroid Adults

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#### Abstract

Background: The deficit of micronutrients, especially of specific vitamins such as vitamin D, has been linked to the increase of overweight and obesity worldwide. However, the current evidence is still weak and inconclusive on this topic. One of the reasons is the heterogeneity of the population in the studies. The only two studies in the Latino population were conducted in people who already had metabolic pathologies. Aim: To assess the association between vitamin D deficiency and overweight/obesity in non-diabetic euthyroid adults. Methods: We performed a cross-sectional analytical study and secondary analysis of medical records of a private health institution's epidemiological surveillance system. Participants were categorized according to the presence or absence of vitamin D deficiency ( $<20\text{ng} / \text{dL}$  and  $\geq 20\text{ng} / \text{dL}$ , respectively). The outcome was overweight/obesity, defined as a BMI  $\geq 25 \text{ kg/m}^2$ . We develop crude and adjusted regression models with Poisson family and robust variances to evaluate the association of interest. Results: The mean age was  $37.8 \pm 9.6$  years, and 111 (66.9%) were female. The prevalence of vitamin D deficiency was 22.9%, and overweight/obesity was 70.5%. In the multivariable model, adjusted for age and sedentary lifestyle, vitamin D deficiency was associated with overweight/obesity in males (aPR: 1.16; 95% CI: 1.02-1.32). Conclusion: This is one of the first studies in the Peruvian population without a history of diabetes or thyroid disease. We found that three-quarters of the population had vitamin D deficiency, and it was associated with the presence of overweight/obesity, but only in the males.

**Keywords:** Avitaminosis; Vitamin D Deficiency; Overweight; Obesity; Adult