

A study of the relationship between serum levels of 25-hydroxy vitamin D and estradiol during the mid-follicular phase of the adult women (A retrospective cross-sectional study)

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Abstract Aim:

The present study was designed to assess the association between serum levels of total hydroxyl vitamin D (25OHD) and estradiol (E₂) in mid-follicular phase in Jordanian women with and without vitamin D deficiency (VDD).

Study Design: Retrospective cohort study.

Methods: One hundred and ninety-two (192) Jordanian women aged between 22-52 years old participated in the study. Participants based on 25OHD levels (ng/ml) were divided into five sub-groups (high normal; >40-70, normal; 30-40, insufficiency; 20-<30, VDD; 10-<20, and severe VDD; <10). Serum vitamin 25OH D was measured using chemiluminescent immunoassay. Parathyroid hormone, calcium, phosphate, fasting lipid profile, and blood glucose were also analyzed. Selected anthropometric parameters and life style factors retrospectively were collected.

Results: The present study showed a significant negative correlation between serum levels of E₂ and 25OHD ($r=0.169$, $P=0.019$). The main finding of this study was that the means E₂ levels (in mid-follicular phase) and 25OHD levels were inversely proportional. A significant, negative association between E₂ and 25OHD levels was noted in women with high normal 25OHD levels ($R=0.780$, $B=-11.050$, $P\text{-value}=0.008$). Stepwise regression showed a strong association and a significant effect of the TG and FBG levels ($R=0.830$, $R^2=0.689$, $P\text{-value}=0.017$, respectively) on E₂ at SVDD level of VD. In women with high normal levels of 25OHD, age factor only showed significant strong negative association with E₂ levels according to the multiple linear regression model indicators, ($R=1.000$, $R^2=1.000$, $P\text{-value}<0.001$).

Conclusion: In healthy Jordanian women, there was a significant negative correlation between serum levels of 25OHD and E₂ in mid-follicular phase. The inverse relationship is proportional to an increase vitamin D level.

Keywords: vitamin D deficiency, estradiol, E₂, 25OHD, mid-follicular