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Randomized controlled study comparing vitamin D and omega 3-fatty acids supplementation in adolescents with polycystic ovary syndrome

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Background: Polycystic ovary syndrome (PCOS) is a complex endocrine genetic disorder, associated with increased metabolic and cardiovascular morbidity. Vitamin D or omega-3 fatty acids supplementation may alleviate the metabolic and reproductive complications of PCOS.
Evidence is limited regarding vitamin D supplementation in adolescents with PCOS.

Objective and hypotheses: To compare clinical, psychometric, biochemical, endocrine, bone and sonographic markers in vitamin D sufficient adolescents with PCOS, pre- and post- 6 month intervention with vitamin D or eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) supplementation.

Methods: Prospective study of adolescents aged 14-18 years with PCOS diagnosed according to Rotterdam criteria and Vitamin D sufficiency (25OHD ≥ 30ng/mL)

Exclusion criteria: severe chronic disease, chronic medication, use of contraceptives or dietary supplements.

Both at baseline and post-intervention, participants underwent detailed clinical, biochemical, endocrine, sonographic and psychometric evaluation, 3-hour OGTT for glucose and insulin, measurement of bone density and body composition by DEXA.

Subsequently, they were randomized into 3 groups:

- Vitamin D (D) group received 2,000 IU D3 daily
- Omega-3 fatty acids (Ω3) group received 1 g EPA & DHA daily
- Control (C) group received no treatment

Results: Study participants included 30 adolescents (mean age 15.7±2.1years), 11 in D-group, 10 in Ω3-group and 9 in C-group.

No statistically significant differences among groups in adolescents' clinical and anthropometric measures, ovarian volumes, hsCRP, IL-6, AUC_G and AUC_I for glucose and insulin, body composition and perceived stress scale-14 score.

Post-intervention and compared with the control group:

D-group had significantly increased serum DHEA (p=0.044), DHEAS (p=0.017) and endometrial thickness (p=0.002)

Ω3-group had significantly decreased serum 25OHD (p=0.007) and PTH (p=0.043) and increased LDL (p=0.046), ApoB (p=0.023) and number of menses (p=0.046)

Conclusion: In adolescents with PCOS, improvement of the menstrual cycle was noted in the group treated with omega-3 fatty acids. There was no improvement in the metabolic profile of patients in either group.

Authors report no conflicts of interest

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