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The effects of vitamin D and omega-3 fatty acid co-supplementation on glycemic control and lipid concentrations in patients with gestational diabetes.

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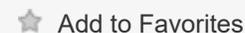
Abstract

OBJECTIVE: This study was performed to evaluate the effects of vitamin D and omega-3 fatty acids co-supplementation on glucose metabolism and lipid concentrations in gestational diabetes (GDM) patients.

METHODS: This randomized double-blind placebo-controlled clinical trial was done among 140 GDM patients. Participants were randomly divided into 4 groups to receive: (1) 1000 mg omega-3 fatty acids containing 360 mg eicosapentaenoic acid and 240 mg docosahexaenoic acid (DHA) twice a day + vitamin D placebo (n = 35); (2) 50,000 IU vitamin D every 2 weeks + omega-3 fatty acids placebo (n = 35); (3) 50,000 IU vitamin D every 2 weeks + 1000 mg omega-3 fatty acids twice a day (n = 35), and (4) vitamin D placebo + omega-3 fatty acids placebo (n = 35) for 6 weeks.

RESULTS: After 6 weeks of intervention, patients who received combined vitamin D and omega-3 fatty acids supplements compared with vitamin D, omega-3 fatty acids, and placebo had significantly decreased fasting plasma glucose (-7.3 ± 7.8 , -6.9 ± 6.6 , -4.0 ± 2.5 , and $+1.0 \pm 11.4$ mg/dL, respectively, $P < .001$), serum insulin levels (-1.9 ± 1.9 , -1.3 ± 6.3 , -0.4 ± 6.3 , and $+2.6 \pm 6.5$ μ U/mL, respectively, $P = .005$), homeostatic model of assessment for insulin resistance (-0.7 ± 0.6 , -0.5 ± 1.4 , -0.2 ± 1.5 , and $+0.6 \pm 1.5$, respectively, $P < .001$) and increased quantitative insulin sensitivity check index ($+0.01 \pm 0.01$, $+0.008 \pm 0.02$, $+0.002 \pm 0.02$, and -0.005 ± 0.02 , respectively, $P = .001$). In addition, changes in serum triglycerides (-8.2 ± 41.0 , $+7.6 \pm 31.5$, $+3.6 \pm 29.9$, and $+20.1 \pm 29.6$ mg/dL, respectively, $P = .006$) and very low-density lipoprotein cholesterol (-1.6 ± 8.2 , $+1.5 \pm 6.3$, $+0.8 \pm 6.0$, and $+4.0 \pm 5.9$ mg/dL, respectively, $P = .006$) in the vitamin D plus omega-3 fatty acids group were significantly different from

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the changes in these indicators in the vitamin D, omega-3 fatty acids, and placebo groups.

CONCLUSION: Overall, vitamin D and omega-3 fatty acids co-supplementation for 6 weeks among GDM patients had beneficial effects on fasting plasma glucose, serum insulin levels, homeostatic model of assessment for insulin resistance, quantitative insulin sensitivity check index, serum triglycerides, and very low-density lipoprotein cholesterol levels.

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KEYWORDS: Gestational diabetes; Glycemic control; Lipid concentrations; Omega-3 fatty acid; Supplementation; Vitamin D

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