

# Effect of omega 3 plus vitamin D & E co-supplementation in women with gestational diabetes: A meta-analysis

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## Introduction:

Women with gestational diabetes mellitus (GDM) are characterized by impaired glucose tolerance and insulin resistance with onset during pregnancy. In 2019, it is estimated that 16% of live births to women suffer from hyperglycemia in pregnancy, and an estimated 84% is documented due to gestational diabetes. May be beneficial to Omega-3 fatty acids plus vitamin D/E to GDM by improving metabolic status in gestational diabetes, but the results are conflicting. We aimed to conduct a systematic literature review and meta-analysis using RCTs and observational studies to evaluate the combined influence of fatty acids of omega-3 and vitamin D/E in GDM.

## Methods:

A systematic search was conducted on MEDLINE, Cochrane Library, and Web of Science to identify studies assessing the influence of both vitamin D/E and omega-3 fatty acids in GDM women. The outcome measures were FPG, homeostasis model of assessment insulin resistance (HOMA-IR), insulin, lipid profiles, oxidative stress and inflammatory biomarkers, and pregnancy outcomes. A meta-analysis was carried out using RevMan 5.3 software. Random effects model was used to compute MD/OR with 95% CI. Study selection and data extraction were by two authors who independently performed the selection of studies based on an initial screening of identified titles and abstracts and the second screening of full-text articles. Studies were eligible if they met the following criteria: (a) pregnant women diagnosed with gestational diabetes mellitus (GDM); (b) intervention treatments were a combination of omega-3 fatty acids and vitamin D or E versus placebo or any other active treatment; (c) randomized controlled trial (RCTs) and observational studies (cross-sectional, cohort, nested case-control, or case-control) study design; (d) published articles which were accessible with full text. Following were the exclusion criteria: animal studies, reviews, conference abstracts without original data, posters, and letters to the editors. Studies with incomplete information or no full text available were also excluded from the analysis.

## Conclusion:

The supplementation of omega-3 fatty acids with vitamin D/E can improve glycemic control and reduce triglycerides, but had no effects on lipid profile in women with GDM. Further studies with large number of sample size are required to confirm the present findings.

## References:

- Behboudi-Gandevani S, Amiri M, Bidhendi Yarandi R, Ramezani Tehrani F. The impact of diagnostic criteria for gestational diabetes on its prevalence: a systematic review and meta-analysis. *Diabetol Metab Syndr.* 2019;11:11.
- Wang H, Li N, Chivese T, et al. IDF Diabetes Atlas: Estimation of Global and Regional Gestational Diabetes Mellitus Prevalence for 2021 by International Association of Diabetes in Pregnancy Study Group's Criteria. *Diabetes Res Clin Pract.* 2022;183:109050.

## Result:

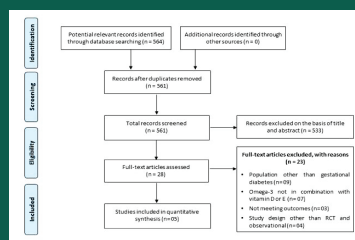


Figure 1: detailed process of study selection

The PRISMA flow diagram summarizing the detailed process of study selection is shown in Figure 1. A total of 564 potentially relevant records retrieved from the electronic search, of which 561 studies were remained after removing the duplicate. The 533 studies were excluded after screening the title and abstract based on inclusion and exclusion criteria. The remaining 28 full-text articles were independently reviewed for eligibility, and 23 articles were further excluded. Finally, five studies qualified for quantitative data synthesis in this study.

SIGNIFICANTLY REDUCING (when combining omega-3 fatty acid plus vitamin D and E)	NO CHANGE (when combining omega-3 fatty acid plus vitamin D and E)	SIGNIFICANTLY INCREASING (when combining omega-3 fatty acid plus vitamin D and E)
↓FPG, HOMA-IR, insulin (significantly),	lipid profile (except triglycerides) and HDL	↑TAC (significantly, increased total antioxidant capacity)
↓Triglycerides (significantly)	GSH	
↓VLDL (significantly)	Caesarean section	
↓MDA (significantly, reduced oxidative stress)	Macrosomia	
	Preterm delivery	
	Newborns hypoglycaemia	

Results of a meta-analysis of omega-3 plus vitamin D and E supplementation

