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Could early life DHA supplementation benefit neurodevelopment? A systematic review and meta-analysis

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Background: Docosahexaenoic acid (DHA) plays a crucial role in the growth and functional development of the infant brain. However, the impact of additional DHA supplementation on neurodevelopment in infants remains controversial in randomized controlled trials. In this systematic review and meta-analysis, we aimed to investigate the effects of prenatal and postnatal DHA supplementation on neurodevelopment.

Methods: We systematically searched the MEDLINE, EMBASE, and Cochrane Library electronic databases using a predefined strategy until 8 February 2024. We extracted relevant study characteristics and outcomes related to the nervous system. Two independent reviewers critically evaluated the included studies to assess their validity and risk of bias.

Results: A total of 21 studies met our inclusion criteria, one study was removed after quality assessment, and the meta-analysis included 9 randomized controlled trials. The meta-analysis results indicated that there was no statistically significant difference between the DHA supplementation group and the placebo group, as assessed by the Mental Development Index [MDI; mean difference (MD), 0.41; 95% confidence interval (CI), -0.91 to 1.73; p = 0.55]. However, the DHA group had a significantly higher Psychomotor Development Index (PDI) than the placebo group (MD, 1.47; 95% CI, 0.23 to 2.72; p = 0.02). Subgroup analyses based on populations showed that DHA supplementation was superior to placebo for infants in both MDI (language score conversion; MD, 2.05; 95% CI, -0.16 to 4.26; p = 0.07) and PDI (MD, 1.94; 95% CI, 0.23 to 3.65; p = 0.03). Other subgroup analyses indicated no statistical differences between the two groups. The remaining assessments that could not be summarized quantitatively underwent a narrative evaluation.

Conclusion: Based on the BSID assessments, DHA supplementation in infants may have potential neurodevelopmental benefits. Because the meta-analysis included few high-quality articles and had some limitations, more relevant articles are needed to address the need for separate DHA supplementation in infants, pregnant women, and lactating mothers.

Keywords: DHA; meta-analysis; offspring neurodevelopment; supplementation; systematic review.

Biography

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