

Maternal diet, LCPUFA status and prematurity in Indian mothers: A cross-sectional study

Prachi S. Ranade¹, Shobha S. Rao^{1,2}

¹Biometry and Nutrition unit, Animal Science Division, Agharkar Research Institute, G.G. Agarkar Road, Pune-411004, India

²**Corresponding author:** Shobha S. Rao, PhD, Biometry and Nutrition unit, Agharkar Research Institute, Pune 411004, India

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ABSTRACT

Background: Recently, certain long chain polyunsaturated fatty acids (LCPUFA) have been shown to exert functional benefits with regards to gestational length. The present study examined the association of maternal LCPUFA intake, specifically Docosahexaenoic acid (DHA) and Arachidonic acid (ARA), and plasma status at delivery with duration of gestation and risk of premature delivery in Indian mothers.

Methods: In a cross-sectional nested case-control study, 191 mother-baby pairs [164 Full term (FT) and 27 Preterm (PT)] were examined for differences in maternal habitual diet pattern and plasma fatty acid composition in relation to the length of gestation.

Results: The frequency of intake of n-3 fatty acid rich varieties of fish was higher ($p < 0.05$) in FT mothers compared to PT mothers. Maternal plasma fatty acid concentration of n-3 Alpha Linolenic acid (ALA), Eicosapentaenoic acid (EPA), DHA and total n-3 fatty acids at delivery was significantly associated with intake of vegetarian ALA sources such as millets, dark whole pulses, dry fruits like walnuts, and green leafy vegetables. Among age, parity, and neonatal sex matched case-control pairs, PT mothers had significantly ($p < 0.01$) higher levels of n-6 ARA, but lower ($p < 0.01$) levels of n-3 DHA and total n-3 fatty acids compared to FT mothers irrespective of socioeconomic group. In fact, mothers with plasma DHA levels below median ($< 3.0\%$) had ten times higher risk (OR-10.47; 95% CI: 3.03-36.48) of delivering prematurely compared to those who had plasma DHA levels above median.

Conclusion: Results underscore the importance of consuming varied sources of ALA and DHA for their role as functional lipids in determining gestational length.

Key words: LCPUFA, maternal diet, omega 3, DHA, preterm birth, relative risk