

Correspondence

Which type of maternal dietary polyunsaturated fat affects fetal adiposity?

We have read the interesting study by Kennedy *et al.*¹ that examined the association between nutrient intake during early pregnancy and offspring adiposity at birth. The study concluded that the intake of polyunsaturated fat was positively associated with neonatal adiposity.¹

We would like to share our concerns on how to interpret this association. In the report,¹ the polyunsaturated fats have not been differentiated into their n-3 and n-6 families, or into their active metabolites, the long-chain polyunsaturated fatty acids (LCPUFA), which may trigger a variety of biological responses, particularly in adipose tissue.^{2,3} This discrimination might be available through the program WISP 4.0 (Tinuviel Software, UK) used in the study. Although there is insufficient scientific evidence regarding the individual effects of n-3 and n-6 PUFA on fetal body composition in humans,⁴ studies *in vitro*, in animal models, and in humans have reported that n-6 fatty acids exert an adipogenic effect whereas n-3 fatty acids exert an antiadipogenic effect.²⁻⁴ One mechanism implicated is the enhancement of preadipocyte differentiation into functional adipocytes promoted by the n-6 LCPUFA arachidonic acid through the action of its metabolite, prostacyclin; in contrast, both n-3 LCPUFA eicosapentaenoic acid and docosahexaenoic acid, seem to counteract this process.²⁻⁴

We are very interested on knowing if the associations observed by Kennedy *et al.*¹ are consistent to those found in our similar, recently published study.⁵ Pereira-da-Silva *et al.*⁵ assessed the association between the intake of LCPUFA during pregnancy and offspring adiposity at birth in 100 mother-infant dyads. Similar to the study by Kennedy *et al.*,¹ the gestational age was confirmed by early ultrasound measurements, air displacement plethysmography was used to measure neonatal body composition, and maternal height and weight were measured rather than self-reported.⁵ In addition to the pre-pregnancy body mass index, the energy and macronutrient intake and gestational weight gain have been considered in a multivariable analysis.⁵ An adjusted positive association was found between maternal n-6:n-3 LCPUFA ratio intake and adiposity in female offspring,⁵ a finding that suggests that the n-6:n-3 fatty acid ratio is at least as important as the individual effect of each fatty acid family.^{2,6}

We suggest that studies exploring the relationship between nutrient intake during pregnancy and offspring adiposity should specifically analyze n-6- and n-3 fatty acid intake and their ratio. Moreover, factors other than pre-pregnancy body mass index that may affect offspring adiposity should be controlled, such as macronutrient intake⁷ and excessive weight gain during pregnancy.⁸

References

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