This influence persists in early neonatal period and might predispose SGA infants to metabolic syndrome in adulthood.

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DIETARY ARG-GLN DIPEPTIDE OR DHA REDUCES PATHOLOGICAL NEOVASCULARIZATION (NV) AND PROMOTES RETINAL VESSEL RE-GROWTH (VR) IN MOUSE MODEL OF ROP

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Aims: ROP is the leading cause of blindness in children. The most abundant sphingolipid in retinal membranes, sphingomyelin (S), is converted to ceramide (C) by acid sphingomyelinase; C/S ratio indicates inflammation and retinal injury. We compared the effects of Arg-Gln dipeptide, alone or with DHA on NV, VR and C/S ratio in a model of ROP.

Methods: 7-day old pups and their nursing dams were placed in 75% oxygen for five days. Pups were returned to room air on postnatal day 12 (P_{12}) and supplemented by oral gavage twice daily with Arg-Gln (5 g/kg/d), DHA (2.5 g/kg/d), Arg-Gln + DHA, or vehicle through P_{17}. On P_{17}, pups were sacrificed and perfused with FITC-labeled dextran. Retinas were assessed for NV by enumeration of pre-retinal endothelial cells, intra-retinal vascular density (VR) or C/S ratio by MS.

Results: Compared to vehicle, pre-retinal NV was reduced by 61% and 51% with Arg-Gln or DHA ($p< 0.05$ both), with a 69% reduction observed for Arg-Gln + DHA ($p< 0.05$). All treatments reduced vaso-obliteration vs. vehicle (32% vs. 5.2%, $p< 0.05$). Arg-Gln, alone or with DHA, promoted intra-retinal vascular density (VR) vs. vehicle (73-76% vs. 53%). Arg-Gln returned retinal C/S ratio to that of control.

Conclusion: These results demonstrate the dietary supplementation with Arg-Gln, alone or with DHA, reduces pre-retinal NV and promotes VR in a model of ROP, underscoring the importance of nutrition in modulating disease course. In addition, C/S ratio was normalized by Arg-Gln, supporting a key role for Arg-Gln in reducing acid sphingomyelinase.

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LANGUAGE AND BEHAVIOUR FOLLOW-UP FROM THE DINO (DHA FOR THE IMPROVEMENT OF NEURODEVELOPMENTAL OUTCOME IN PRETERM INFANTS) TRIAL

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Background: Higher-dose docosahexaenoic acid, DHA, (~1% total fats) compared with standard-dose (~0.3%) in infants born < 33 weeks gestation improved the mental development of girls (JAMA, 2009). We aimed to evaluate the effect of higher-DHA milk on behaviour and language development in early childhood.

Method: Follow-up of a subgroup of infants (n=143) enrolled in the DINO trial. DINO was a multicentre randomised controlled trial, n=657, with stratification for sex, birth weight (< 1250g, ≥1250g) and centre. Lactating women took tuna oil capsules (higher-dose DHA) or soy oil capsules (standard); preterm infant formula with matching DHA composition was given if needed.

Language was assessed using the MacArthur Communicative Development Inventory (MCDI) at 26 months corrected age (CA). The Strengths and Difficulties Questionnaire (SDQ) and Short Temperament Scale for Children (STSC) were used to assess behaviour at 3-5 years CA.**Results:** MCDI scores did not differ between groups (Vocabulary Production: higher-DHA (mean±SD) 308±79; control 316±92; P=0.8). Overall, there was a higher incidence of behavioural difficulties in these children compared with term-born children. However, the SDQ and STSC composite scores did not differ between groups (SDQ total difficulties: higher-DHA 10.3±6.0; control 9.5±5.5; P=0.5; STSC score: higher-DHA 3.1±0.7; control 3.0±0.7; P=0.3).

Conclusions: In this subgroup of infants, feeding preterm infants milk containing 3 times the standard DHA level did not result in any clinically meaningful change to language development or behaviour in early childhood.