THE EFFECT OF MATERNAL DHA SUPPLEMENTATION DURING THE FIRST 12 WEEKS OF LACTATION ON BREAST MILK AND INFANT FATTY ACID PROFILES

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Recommendations have recently been made that lactating women increase their consumption of fish products to improve breast milk concentrations of long chain polyunsaturated fatty acids (LCPUFA), in particular docosahexaenoic acid (DHA). Increasing the LCPUFA content of formula increases the rate of neural maturation of formula-fed infants (Makrides et al. 1995). However, there is no evidence to suggest that increasing the dietary intake of LCPUFA during lactation will have the same effect.

This study assesses the effect of varying the DHA intake (3-15 fold) by randomising mothers to equal numbers of capsules containing either placebo or DHA-rich oil. Maternal intake therefore ranged from Western omnivorous levels of 100 mg DHA/d in the placebo group to 1500 mg/d, equivalent to the intake of fish-eating Eskimo communities. No side effects were noted from the capsules. Maternal plasma DHA levels increased and were strongly associated with DHA in breast milk (r^2=0.84, P<0.001). Breast milk DHA levels ranged from 0.2 to 1.2% of total fatty acids spanning the range of DHA values reported in the literature from Western, omnivorous to Eskimo women. Breast milk arachidonic acid (AA) was only slightly reduced with increasing DHA levels (r^2=0.13, P<0.001).

Infant erythrocyte DHA was related to breast milk DHA in a saturable way (r^2=0.79, P<0.001), with the level of erythrocyte DHA reaching a plateau when breast milk DHA is above approximately 0.55% total fatty acids. Infant erythrocyte AA was negatively associated with breast milk DHA (r^2=0.36, P<0.01). These findings support the widely reported competition for incorporation into membranes between ω3 and ω6 LCPUFA, although the increase in DHA was not exactly matched by the reduction in AA.

The effect on infant visual function was estimated by utilising the visual evoked potential (VEP) acuity test at 12 weeks post natal age. There was no relationship between erythrocyte DHA level and VEP acuity. Whether increasing the DHA level of breast milk is of benefit to the infant must await further follow up at four, eight (VEP) and 12 (Bayley's Developmental Test) months' of age.

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