

Issue 91

Baby formula and infant development

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In a nutshell

The basic science showing the importance of long chain polyunsaturated fatty acids to neural development is strong.

But the clinical evidence that supplementing LCPs helps psychomotor development in normal infants is still contradictory. It is better in relation to premature and growth-retarded infants.

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NUTRITION RESEARCH REVIEW

Study one: From USA

Supplementation of infant formula with long chain polyunsaturated fatty acids (LCPs) in term infants is associated with higher mental development scores at 18 months of age, according to results of American research.

Subjects: 56 term infants enrolled within the first 5 days of life.

Method: Randomised placebo-controlled trial. Active treatment was infant formula supplemented with docosahexaenoic acid (DHA - 0.35%) or DHA and arachidonic acid (AA - 0.72%).

Infants were fed the assigned formula until 17 weeks of age. The children were tested for mental development (using the Mental Development Index - MDI) at 18 months of age.

Results: Both supplemented groups had significantly higher MDI scores than the control formula group. This was seen in both the cognitive and motor subscales of the MDI, and as a trend that did not reach statistical significance in the language subscale.

Reference: Birch EE et al. A randomized controlled trial of early dietary supply of long-chain polyunsaturated fatty acids and mental development in term infants. *Dev Med Child Neurol* 2000;42:174-81

Study two: From Australia

There is no beneficial effect of LCP supplementation of infant formula in term infants, according to results from Australian research.

Subjects: 68 formula fed infants and 46 breastfed infants.

Method: The formula fed children were randomly allocated to receive either formula including either DHA, DHA+AA, or neither (placebo) until 12 months of age. The children were assessed for growth, visual acuity and mental development (MDI scale) at 1 and 2 years of age.

Results: There were no significant differences in any of these measures between the placebo- and LCP formula-fed children. The only significant differences were better visual acuity at 34 weeks and higher MDI scores in the breastfed infants at 2 years.

Reference: Makrides M et al. A critical appraisal of the role of dietary long-chain polyunsaturated fatty acids on neural indices of term infants: a randomized, controlled trial. *Pediatrics* 2000;105:32-8

Study three: From England

A larger English study also found no beneficial effect of LCP supplementation of infant formula in term infants.

Subjects: 309 formula fed infants and 138 infants breastfed for at least six weeks.

Method: The formula fed children were randomised to formula with or without LCPs and assessed for growth, infection, allergic responses, cognitive and motor development at 18 months of age.

Results: There were no significant differences observed between children fed LCP vs non-LCP supplemented formula.

Reference: Lucas A et al. Efficacy and safety of long-chain polyunsaturated fatty acid supplementation of infant-formula milk: a randomised trial. *Lancet* 1999;354:1948-54

Comments

The value of supplementing infant formula with long chain fatty acids has been hotly debated since the first studies which showed a connection between LCP and visual acuity in infants a decade ago. It is not only a clinical question but also a commercial one - many manufacturers now include LCPs in their infant formulas.

The American and Australian studies discussed here used similar protocols and similar study groups but came to opposite conclusions. Even though the Australian study involved LCP feeding for a longer time period and the follow-up was a little longer, there is no obvious reason why this should be so. The English study was larger than either of the other two, but was also unable to show any significant benefit in relation to either growth or mental development.

On this basis, we have to conclude that the clinical value of LCP supplementation for healthy term infants is unproven.

At the same time, it is true that the basic science suggesting an important role of LCPs in infant development is strong, for example in relation to visual acuity. But we have more work to do in defining the clinical implications.

What we can say at this stage is that:

- the case for LCP supplementation is stronger in relation to premature and growth-retarded newborns than for term infants.
- the value of breastfeeding is further confirmed.
- So far the evidence suggests that LCP supplementation is reasonably safe. At the same time, there is continued discussion and research into the optimal balance of fatty acids in formula feeding (for example between omega:3 and omega:6 fatty acids).

One question that needs careful assessment is whether LCP supplementation (of either mother or child) has a role where the mother's nutritional status is poor. Another area of recent research interest has been the possible relationship between LCP status and attention deficit disorders in children and adults. We look forward to dealing with some of these questions in future issues!

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