Multicomponent fortified human milk for promoting growth in preterm infants (Review)

Kuschel CA, Harding JE

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2009, Issue 1

http://www.thecochranelibrary.com

[Intervention Review]

Multicomponent fortified human milk for promoting growth in preterm infants

Carl A Kuschel[1], Jane E Harding[2]

[1]Neonatal Services, The Royal Women's Hospital, Carlton, Australia. [2]Department of Paediatrics, University of Auckland, Auckland, New Zealand

Contact address: Carl A Kuschel, Neonatal Services, The Royal Women's Hospital, 132 Grattan Street, Carlton, Victoria, 3053, Australia. carl.kuschel@rwh.org.au.

Editorial group: Cochrane Neonatal Group.
Publication status and date: Edited (no change to conclusions), published in Issue 1, 2009.
Review content assessed as up-to-date: 28 August 2003.

Citation: Kuschel CA, Harding JE. Multicomponent fortified human milk for promoting growth in preterm infants. *Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD000343. DOI: 10.1002/14651858.CD000343.pub2.

ABSTRACT

Background

For term infants, human milk provides adequate nutrition to facilitate growth, as well as potential beneficial effects on immunity and the maternal-infant emotional state. However, the role of human milk in premature infants is less well defined as it contains insufficient quantities of some nutrients to meet the estimated needs of the infant. Observational studies have suggested that infants fed formula have a higher rate of growth than infants who are breast fed. However, there are potential short term and long term benefits from human milk. Commercially-produced multicomponent fortifiers provide additional nutrients to supplement human milk (in the form of protein, calcium, phosphate, and carbohydrate, as well as vitamins and trace minerals).

Objectives

The main objective was to determine if addition of multicomponent nutritional supplements to human milk leads to improved growth, bone metabolism and neurodevelopmental outcomes without significant adverse effects in premature infants.

Search methods

Searches were made of the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library, Issue 2, 3003), MEDLINE (searched August 29, 2003), previous reviews including cross references, abstracts, conferences and symposia proceedings, expert informants, journal handsearching mainly in the English language.

Selection criteria

All trials utilising random or quasi-random allocation to supplementation of human milk with multiple nutrients or no supplementation in premature infants within a nursery setting were eligible.

Data collection and analysis

Data were extracted using the standard methods of the Cochrane Collaboration and its Neonatal Review Group, with separate evaluation of trial quality and data extraction by each author and synthesis of data using relative risk and weighted mean difference.

Main results

Supplementation of human milk with multicomponent fortifiers is associated with short term increases in weight gain, linear and head growth. There is no effect on serum alkaline phosphatase levels; it is not clear if there is an effect on bone mineral content. Nitrogen retention and blood urea levels appear to be increased.

There are insufficient data to evaluate long term neurodevelopmental and growth outcomes, although there appears to be no effect on growth beyond one year of life.

Use of multicomponent fortifiers does not appear to be associated with adverse effects, although the total number of infants studied and the large amount of missing data reduces confidence in this conclusion. Blood urea levels are increased and blood pH levels minimally decreased, but the clinical significance of this is uncertain.

Authors' conclusions

Multicomponent fortification of human milk is associated with short-term improvements in weight gain, linear and head growth. Despite the absence of evidence of long-term benefit and insufficient evidence to be reassured that there are no deleterious effects, it is unlikely that further studies evaluating fortification of human milk versus no supplementation will be performed. Further research should be directed toward comparisons between different proprietary preparations and evaluating both short-term and long-term outcomes in search of the "optimal" composition of fortifiers.

PLAIN LANGUAGE SUMMARY

Multicomponent fortified breast milk for promoting growth in preterm infants

Babies born at full term (40 weeks) get all their nutritional needs from breast milk. Babies born early (preterm) have different needs and grow very rapidly. Those fed breast milk may need extra supplements. The review of trials found evidence that adding nutritional supplements to breast milk leads to short term improved growth and possibly also bone formation. The review found no evidence of long-term benefits or adverse effects.