Short-term effects of breastfeeding

A SYSTEMATIC REVIEW ON THE BENEFITS OF BREASTFEEDING ON DIARRHOEA AND PNEUMONIA MORTALITY

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Summary

Background

Several studies suggest that breastfeeding has clear short-term benefits, particularly reducing morbidity and mortality due to infectious diseases in childhood. These benefits have been reported in low and middle income and in high-income countries.

Objective

This systematic review and meta-analysis was aimed at assessing the effect of breastfeeding on respiratory infections and diarrheal disease in childhood.

Search strategy

Two independent literature searches were carried out, comprising the MEDLINE (1966 to December 2011) and Scientific Citation Index databases.

Selection criteria

We selected observational and randomized studies, published in English, French, Spanish or Portuguese that evaluated the associations between breastfeeding and diarrhea or respiratory infections outcomes in children younger than 5 years of age. Studies that did not use an internal comparison group were excluded from the meta-analyses. The type of categorization of breastfeeding varied by study, but in all of them it was possible to compare a group with more intense breastfeeding practices with another with less intense breastfeeding. (e.g., ever versus never breastfed; breastfed for x months versus breastfed for less than x months, exclusively versus partially or not breastfed, etc.).

Data extraction and analysis

Two reviewers using a standardized protocol independently evaluated the manuscripts; any disagreements were solved by consensus. Heterogeneity among studies was assessed with the Q-test and I-square. Because heterogeneity was evident for all outcomes, random-effects models were used throughout.

Effect on diarrhea

We identified 15 studies that provided 18 estimates on the effect of breastfeeding on diarrhea morbidity among children < 5 years. More intense breastfeeding practices were associated with a pooled relative risk of diarrhea incidence of 0.69 (95% confidence interval: 0.58; 0.82) compared to less intense breastfeeding. Among infants aged \leq 6 months, we obtained 49 estimates from 23 studies, with a corresponding pooled relative risk 0.37 (95% confidence interval: 0.27; 0.50). We also identified 11 studies that evaluated children aged > 6 months, among whom the pooled relative risk was 0.46 (95% confidence interval: 0.28; 0.78). Breastfeeding also decreased the risk of hospitalization from diarrhea [pooled relative risk: 0.28 (95% confidence interval: 0.16; 0.50) and diarrhea mortality [pooled relative risk: 0.23 (95% confidence interval: 0.13; 0.42)]. Furthermore, we identified three randomized trials of breastfeeding promotion; diarrhea morbidity was lower in the group receiving the intervention [pooled relative risk: 0.69 (95% confidence interval: 0.49; 0.96)].

Effect on respiratory infection

We identified 18 studies that provided 22 estimates on the effect of breastfeeding on any respiratory infection outcome for any subgroup of under-five children, and 16 studies that restricted the analysis to infants aged \leq 6 months. Breastfeeding reduced the risk of hospitalization for respiratory infection by 57% [pooled relative risk: 0.43 (95% confidence interval: 0.33; 0.55)], and this protective effect did not change with age. Studies that compared breastfed with non-breastfed children reported the highest protective effect [pooled relative risk: 0.33 (95% confidence interval: 0.24; 0.46)] against hospitalization for respiratory infection. Mortality from lower respiratory tract infections was also reduced among breastfed children [pooled relative risk: 0.30 (95% confidence interval: 0.16; 0.56)]. Furthermore, breastfeeding also reduced the prevalence or incidence of lower respiratory tract infection [pooled relative risk: 0.68 (95% confidence interval: 0.60; 0.77)].

Limitations

Because nearly all studies included in the analyses are observational, we were not able to completely rule out the possibility that the beneficial effect of breastfeeding was due to self-selection of breast-feeding mothers or residual confounding. Nevertheless, we identified three randomized trials in which breastfeeding promotion reduced the risk of diarrhea.

Reviewer's conclusion

The available evidence suggests that breastfeeding reduces the risk of diarrhea and respiratory infection. All effects were statistically significant, and for most outcomes the magnitude of the effects were large. Protection was observed both in low income and high income countries.

... CHAPTER 1 ... Introduction

Breastfeeding has well-established short-term benefits, particularly the reduction of morbidity and mortality due to infectious diseases in childhood. A pooled analysis of studies carried out in middle/ low income countries showed that breastfeeding substantially lowers the risk of death from infectious diseases in the first two years of life (1). These benefits have also been reported in high-income countries. Based on data from the United Kingdom Millennium Cohort, Quigley et al (2) estimated that optimal breastfeeding practices could prevent a substantial proportion of hospital admissions due to diarrhea and lower respiratory tract infection.

A systematic review by Kramer et al (3) confirmed that exclusive breastfeeding in the first 6 months of life decreases morbidity from gastrointestinal and allergic diseases, without any negative effects on growth. Given such evidence, it has been recommended that in the first six months of life, every child should be exclusively breastfed, with partial breastfeeding continued until two years of age (4).

This systematic review and meta-analysis was aimed at assessing the effect of breastfeeding on respiratory infection and diarrhea disease in childhood.

••• CHAPTER 2 •••

Methodological issues

Randomized controlled trials often provide the best evidence on the association between an exposure – such as breastfeeding – and a health outcome. Randomization results in a high likelihood that the study will not be affected by confounding or self-selection (*5*). Furthermore, existing guidelines propose standards for conducting, analyzing and reporting clinical trials, which help increase the validity of the evidence (*6*).

On the other hand, the short-term benefits of breastfeeding evaluated in the present meta-analyses are an ethical challenge to the design of randomized trials on the consequences of breastfeeding. It is currently unethical to randomly allocate subjects to receive breastmilk. But, it is ethically sound to allocate mothers to receive - or not to receive - breastfeeding counseling. In Belarus, the Promotion of Breastfeeding Trial (7) randomly assigned maternity hospitals and their affiliated polyclinics to the Baby-Friendly Hospital Initiative. The proportion of infants exclusively breastfed at 3 and 6 months was substantially higher among infants from the intervention group. This trial is ethically sound because mothers were randomly assigned to receive intense breastfeeding promotion, compared to usual care in the hospitals. On the other hand, compliance to the intervention was far from universal, only 43.3% of the infants in the intervention group were exclusively breastfed at 3 months compared to 6.4% in the comparison arm. In Mexico, Morrow et al (8) randomly allocated mothers to one of the intervention group (six or three breastfeeding-counseling home visits) or to the control group. The proportion of exclusively breastfed infants at 3 months was higher among those whose mother received six visits. In another trial in India, mothers were assigned to receive or not visit on promotion of exclusive breastfeeding, at 3 months the proportion of exclusively breastfed infants was higher among infants in the intervention group (9). In these trials, intervention and control groups represented a mixture of breastfeeding practices. Therefore, the effect of breastfeeding is underestimated, and statistical power is reduced.

The assessment of the evidence on the health consequences of breastfeeding is mostly based on

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