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[Intervention Review]

Breastfeeding for procedural pain in infants beyond the neonatal period

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ABSTRACT

Background

Randomised controlled trials (RCTs) show that breastfeeding newborn infants during painful procedures reduces pain. Mechanisms are considered to be multifactorial and include sucking, skin-to-skin contact, warmth, rocking, sound and smell of the mother, and possibly endogenous opiates present in the breast milk.

Objectives

To determine the effect of breastfeeding on procedural pain in infants beyond the neonatal period (first 28 days of life) up to one year of age compared to no intervention, placebo, parental holding, skin-to-skin contact, expressed breast milk, formula milk, bottle feeding, sweet-tasting solutions (e.g. sucrose or glucose), distraction, or other interventions.

Search methods

We searched the following databases to 18 February 2016: the Cochrane Central Register of Controlled Trials (CENTRAL) (the Cochrane Library), MEDLINE including In-Process & Other Non-Indexed Citations (OVID), Embase (OVID), PsycINFO (OVID), and CINAHL (EBSCO); the metaRegister of Controlled Trials (mRCT), ClinicalTrials.gov (clinicaltrials.gov), and the World Health Organization International Clinical Trials Registry Platform (WHO ICTRP) (apps.who.int/trialsearch/) for ongoing trials.

Selection criteria

We included RCTs and quasi-RCTs involving infants aged 28 days postnatal to 12 months and receiving breastfeeding while undergoing a painful procedure. Comparators included, but were not limited to, oral administration of water, sweet-tasting solutions, expressed breast or formula milk, no intervention, use of pacifiers, positioning, cuddling, distraction, topical anaesthetics, and skin-to-skin care. Procedures included, but were not limited to: subcutaneous or intramuscular injection, venipuncture, intravenous line insertion, heel lance, and finger lance. We applied no language restrictions.

Data collection and analysis

We used standard methodological procedures expected by Cochrane. Two review authors independently considered trials for inclusion in the review, assessed risk of bias, and extracted data. The main outcome measures were behavioural or physiological indicators and composite pain scores, as well as other clinically important outcomes reported by the authors of included studies. We pooled data for the most comparable outcomes and where data from at least two studies could be included. We used mean difference (MD) with 95%

confidence interval (CI), employing a random-effects model for continuous outcomes measured on the same scales. For continuous outcomes measured on different scales, we pooled standardised mean differences (SMDs) and associated 95% CIs. For dichotomous outcomes, we planned to pool events between groups across studies using risk ratios (RRs) and 95% CIs. However, as insufficient studies reported dichotomous outcomes, we did not pool such events. We assessed the evidence using GRADE and created a 'Summary of findings' table.

Main results

We included 10 studies with a total of 1066 infants. All studies were conducted during early childhood immunisation. As the breastfeeding intervention cannot be blinded, we rated all studies as being at high risk of bias for blinding of participants and personnel. We assessed nine studies as being at low risk of bias for incomplete outcome data. In addition, we rated nine studies as high risk for blinding of outcome assessment. We scored risk of bias related to random sequence generation, allocation concealment, and selective reporting as unclear for the majority of the studies due to lack of information.

Our primary outcome was pain. Breastfeeding reduced behavioural pain responses (cry time and pain scores) during vaccination compared to no treatment, oral water, and other interventions such as cuddling, oral glucose, topical anaesthetic, massage, and vapocoolant. Breastfeeding did not consistently reduce changes in physiological indicators, such as heart rate. We pooled data for duration of cry from six studies (n = 547 infants). Breastfeeding compared to water or no treatment resulted in a 38-second reduction in cry time (MD -38, 95% CI -50 to -26; P < 0.00001). The quality of the evidence according to GRADE for this outcome was moderate, as most infants were 6 months or younger, and outcomes may be different for infants during their 12-month immunisation. We pooled data for pain scores from five studies (n = 310 infants). Breastfeeding was associated with a 1.7-point reduction in standardised pain scores (SMD -1.7, 95% CI -2.2 to -1.3); we considered this evidence to be of moderate quality as data were primarily from infants younger than 6 months of age. We could pool heart rate data following injections for only two studies (n = 186); we considered this evidence to be of low quality due to insufficient data. There were no differences between breastfeeding and control (MD -3.6, -23 to 16).

Four of the 10 studies had more than two study arms. Breastfeeding was more effective in reducing crying duration or pain scores during vaccination compared to: 25% dextrose and topical anaesthetic cream (EMLA), vapocoolant, maternal cuddling, and massage.

No included studies reported adverse events.

Authors' conclusions

We conclude, based on the 10 studies included in this review, that breastfeeding may help reduce pain during vaccination for infants beyond the neonatal period. Breastfeeding consistently reduced behavioural responses of cry duration and composite pain scores during and following vaccinations. However, there was no evidence that breastfeeding had an effect on physiological responses. No studies included in this review involved populations of hospitalised infants undergoing other skin-breaking procedures. Although it may be possible to extrapolate the review results to this population, further studies of efficacy, feasibility, and acceptability in this population are warranted.

PLAIN LANGUAGE SUMMARY

Does breastfeeding reduce vaccination pain in babies aged 1 to 12 months?

Bottom line

We found that breastfeeding before and during vaccination injections helped to reduce pain in most babies up to the age of one year.

Background

Needles are used for babies' early childhood vaccinations and medical care during childhood illnesses. These are essential, but painful. They cause distress for the babies and often their parents/caregivers, and can result in future anxiety and fear about needles. Breastfeeding during blood tests in newborn babies reduces pain. Breastfeeding when possible and feasible may also help to comfort babies and reduce their pain beyond the newborn period and throughout infancy.

Study characteristics

In February 2016 we searched the medical literature for studies examining the effectiveness of breastfeeding babies 1 to 12 months old during the use of needles. We compared effectiveness of breastfeeding in reducing pain (as scored by crying time and pain scores), to holding, babies lying flat, or the giving of water or sweet solutions. We found 10 studies with a total of 1066 infants. All studies examined if breastfeeding reduced pain during vaccinations.

Key results

Breastfeeding reduced crying in young babies having vaccinations. On average, breastfed babies cried for 38 seconds less than babies who were not breastfed (6 studies; 547 infants; moderate-quality evidence), and pain scores were significantly lower (5 studies; 310 infants; moderate-quality evidence).

No studies reported on any harm (very low-quality evidence). We could draw no conclusions on risk of harm while breastfeeding healthy babies during vaccination.

Going forward: if mothers are breastfeeding, it could be considered when possible for babies during vaccinations. More evidence is needed to learn if breastfeeding helps older babies and babies in hospital during blood work or procedures such as insertion of drips.

Quality of the evidence

The quality of the evidence was moderate for crying time and pain scores. Most studies included younger infants aged 1 to 6 months. Further research including older infants up to 12 months of age may change our conclusions. In addition, the studies evaluated the effects of breastfeeding during vaccination. We do not know whether breastfeeding helps sick babies aged 1 to 12 months in hospital during blood sampling or drip insertion.