Music for medical indications in the neonatal period: a systematic review of randomised controlled trials

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CRD summary
This review studied the effects of music for medical procedures in neonates. The authors concluded that there was preliminary evidence for some therapeutic benefit of music for specific indications, but these findings needed to be confirmed in trials with rigorous methods. The review was reasonably well conducted and the authors’ conclusions appear to be reliable within the limitations of the included data.

Authors’ objectives
To determine the efficacy of music for medical indications in newborn babies.

Searching
Fifteen electronic databases including MEDLINE, EMBASE, and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched in July 2007, and the key-database searches were updated in May 2008. Search terms were reported and no language restrictions were imposed. Reference lists of retrieved articles were also searched. Searches for grey literature were conducted in DDM-Online, Proquest, OCLC Proceedings, and OCLC PapersFirst. The search strategies were provided in an online appendix.

Study selection
Randomised controlled trials (RCTs) examining the effects of music on babies younger than one month were eligible for inclusion. Pain, physiological parameters, or behavioural parameters had to be reported.

The majority of trials were in pre-term babies, and all of them studied the effects of music, which included classical music, lullabies, intra-uterine music, and nursery rhymes, compared with control groups. The outcomes were pain, behavioural state, and physiological measures, such as heart rate and blood pressure. The settings included the nursery and the intensive care unit. The trials assessed various procedures including heel prick, circumcision, and non-nutritive sucking to improve feeding.

Two authors selected trials independently and disagreements were resolved through team discussion.

Assessment of study quality
Validity was assessed using the Jadad criteria for randomisation, blinding, reporting of drop-outs and withdrawals, and allocation concealment, with a maximum of five points.

Two authors independently assessed validity and disagreements were resolved through consensus.

Data extraction
Data were extracted on the characteristics of the trial, the trial population, the description of interventions and comparators, the outcome measures and tools, and the results.

One author extracted the data, which was checked by a second reviewer.

Methods of synthesis
Trials were summarised in tables and narratively discussed according to type of medical indication.

Results of the review
A total of nine RCTs (n=388) were included in the review. The number of babies included in each trial ranged from 14
to 121. The methodological quality was generally poor, with six trials scoring one point (low quality) on the Jadad scale, and only two trials scoring three or four points (high quality). The main flaws were a failure to use an appropriate randomisation method, a lack of double-blinding, and a failure to describe the drop-outs and withdrawals.

**Circumcision** (three trials): One high-quality trial found a benefit of music in significantly lower pain scores and higher oxygen saturation levels, compared with no music. Two poorly reported trials showed no benefit of music.

**Heel prick** (three trials): Two low-quality trials showed a benefit of music in heart rate and pain during heel prick. One low-quality trial found no benefit of music.

**Other procedures** (three trials): One high-quality trial in babies with chronic lung disease found no benefit of music in physiological and behavioural outcomes. One medium-quality trial of music-reinforced non-nutritive sucking among poorly feeding babies found a significant increase in the oral feeding rate compared with no music reinforcement. One low-quality trial, of the effects of music on physiology and behaviours in healthy babies, found that live music showed significant benefits in heart rate and behavioural scores, but recorded music was no better than no music. This trial also found that parents and personnel preferred live music.

**Authors’ conclusions**
There was preliminary evidence for some therapeutic benefit of music for specific indications, but these findings needed confirmation from trials with rigorous methods.

**CRD commentary**
The inclusion criteria were broadly defined and several relevant sources were searched. There were attempts to minimise error and bias throughout the review process by two people performing the study selection and validity assessment and by ensuring that all extracted data was checked by a second reviewer. There was potential for publication bias, but given the number of databases that were searched, including grey literature, this risk was likely to be low. The validity assessment indicated that many of the trials were of low quality and small, which may have introduced bias into the analysis. No meta-analysis was undertaken as the trials were, appropriately, deemed to be too disparate; instead a narrative synthesis was undertaken and the results were grouped by medical procedure. Few of the actual results from the individual trials were presented, except for p values, which were not very informative.

The review was reasonably well conducted and the authors’ conclusions appear to be reliable within the limitations of the included data.

**Implications of the review for practice and research**
- **Research**: The authors stated that large RCTs with rigorous methods and of longer durations were needed to confirm the benefits of music for neonates.
- **Practice**: The authors did not state any implications for practice.

**Funding**
No funding received.

**Bibliographic details**

**PubMedID**
19477913

**DOI**
10.1136/adc.2008.148411

Original Paper URL
http://fn.bmj.com/content/94/5/F349.abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Humans; Infant, Newborn; Music /psychology; Pain /prevention & control /psychology; Randomized Controlled Trials as Topic; Sucking Behavior /physiology

AccessionNumber
12009108390

Date bibliographic record published
02/12/2009

Date abstract record published
05/05/2010

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.