Multidisciplinary research of multimodal stimulation of premature infants: an integrated review of the literature

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Authors' objectives
To review and integrate current multidisciplinary research literature regarding multiple sensory stimulation of premature infants.

Searching
CINAHL, MEDLINE, PsycLIT and a social science database were searched using the search terms provided. Additional studies were located by examining bibliographies of retrieved articles, and manually searching indices and tables of contents of major journals (unspecified).

Study selection
Study designs of evaluations included in the review
Eleven studies met the inclusion criteria, 4 of which were randomised controlled trials (RCTs). Other designs appear to have been included, such as case series and non-randomised comparative studies. Single case studies were excluded.

Specific interventions included in the review
Comprehensive individual nursing care (including lowered ambient light or sound; use of aids to promote non-nutritive sucking and grasping; periods of uninterrupted sleep; awareness of infant cues, and provision of 'time out' when signs of stress are observed; and use of physical supports), handling (proprioceptive, kinaesthetic, vestibular, tactile and positioning) and other sensory stimulation (oral, non-nutritive sucking, visual, auditory and rhythmic breathing).

Participants included in the review
Premature infants of average gestational age 30 weeks (range: 26.3 to 34.1) were included. The average age at the start of the study period was 2 to 3 weeks (32 to 34 weeks gestational age). The average birth weight was 1,380 g (range: 831 to 1,956).

Outcomes assessed in the review
1. Physiological variables (medical diagnosis, body temperature, pulse rate, respiratory rate, oxygen level, caloric intake and weight gain).
2. Hospital progression (age at discharge, days in hospital, days on ventilator and days on oxygen).
3. Infant behaviours (body, limb or eye movements; non-nutritive sucking; infant cues).
4. Infant states and behavioural organisation (level of consciousness, scores on the Assessment of Premature Infant Behaviour (APIB), scores on the Brazelton Neonatal Behavioural Assessment Scale).
5. Infant development scores on the Bayley Scales of Infant Development.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for review, or how many of the reviewers performed the selection.

Assessment of study quality
The author does not state that they assessed validity.
Data extraction
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative review.

How were differences between studies investigated?
The author does not state how differences between the studies were investigated.

Results of the review
Eleven studies met the inclusion criteria (total of 483 infants).

Overall, the infants responded positively to the interventions, which included changes in heart rate, respiratory rate, oxygenation levels and behavioural cues. A consistently positive significant change was the establishment of earlier oral feeding. In 3 of the 4 studies assessing weight, treatment resulted in weight gain. Infants in stimulation groups were discharged slightly earlier. Stimulation resulted in transient increases in heart rate and respiratory rate. Handling made little difference to vital signs and oxygen levels; had a positive effect on weight gain and an uncertain effect on hospital course; and increased infant movements, alert states and scores on measures of organisation and Bayley exams. Visual stimulation had no effect on vital signs or hospital course, but improved weight gain, alert state and Bayley scores. Auditory stimulation had no effect on vital signs, but improved weight gain, hospital course and Bayley scores. The comprehensive programme improved weight gain, hospital course, infant behaviours, alert state and APIB and Bayley scores.

Authors' conclusions
Neonatal nurses must be sensitive to the environmental context in which they practice, and to the developmental needs of their patients. Stimuli should be provided in small increments, withdrawn if too stressful for the infant, and should help the infant with behavioural organisation and/or introduce the activities expected in the next developmental stage or level.

CRD commentary
There appears to be little good evidence to support the author's conclusions. There is no assessment of the validity of the included studies, and no systematic differentiation between methodologically weaker and stronger study designs. The validity of the review's results is, therefore, unclear.

Bibliographic details

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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.