

Is kangaroo care better than standard care for low birth weight infants?

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SUMMARY STATEMENT:

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REQUEST:

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REQUESTED BY:

Peng Chee, CNS, Newborn services, Monash Medical Centre, Clayton

METHODOLOGY

Search Strategy

The Centre for Clinical Effectiveness defines the 'best available evidence' as that research we can identify that is least susceptible to bias. We determine this according to pre-defined National Health and Medical Research Council (NHMRC, 2000) criteria (see Appendix 1).

First, we search for systematic reviews, evidence based clinical practice guidelines, health technology assessments and randomised controlled trials. If we identify sound, relevant material of this type, the search stops. Otherwise, our search strategy broadens to include studies that are more prone to bias, less generalisable or have other methodological difficulties. We include case-control and longitudinal cohort studies in our critical appraisal reports. While we cite observational and case series studies, and narrative reviews and consensus statements, in our reports we do not critically appraise them. Such studies can produce accurate results but they are generally too prone to bias to allow determination of their validity beyond their immediate setting.

Details of Evidence Request

Patient (subject): Low birth weight Infants/Neonates
Intervention: Kangaroo care
Comparison: Standard care
Outcomes: Safety, mortality, morbidity, growth, weight gain, length of hospitalisation, readmission.

Search terms:

(see Appendix 2 for exact search strategy)

Patient (Subject) terms: Infant/s, low birth weight infants, Newborn infant, neonate/s
Intervention terms: Kangaroo mother care, kangaroo care, skin-to-skin contact

Resources Searched

We searched the following databases:

Cochrane Library CD-ROM- Issue 1, 2001

Medline (OVID)- Mid 1998 to May week 3 2001

CINAHL (OVID) – 1982 to April 2001

PreMedline (OVID)- May 29, 2001

Refinements, Searching & Reporting Constraints:

We included items of evidence that were available to us on 30 May 2001. The search was restricted to articles published in English.

RESULTS:

From our sources we identified 1 relevant systematic review by Conde-Agudelo et al (2001). After examination of the full text, the article was critically appraised.

Table 1. Study designs of articles retrieved by search

Study Design	Number
Systematic reviews or meta-analyses	1
Evidence-based clinical practice guidelines	0
Randomised controlled trials	0
Pseudorandomised controlled trials	0
Controlled trials, cohort or case-control analytic studies	0

Based on our refinements, searching and reporting constraints we are reasonably confident this article represents the most relevant findings published to date.

EVIDENCE SUMMARIES

Format

Evidence summaries are presented as spreadsheets attached to this report. Each spreadsheet contains the article citation, details of the study design, patient description, scientific validity of the article, results, and pertinent remarks from the authors and Centre for Clinical Effectiveness reviewer.

REFERENCES

ARTICLE CRITICALLY APPRAISED

Conde-Agudelo A, Diaz-Rossello JL, Belizan JM (2001). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants (Cochrane Review). In: The Cochrane Library, Issue 2. Oxford: Update Software.

APPENDIX 1

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Levels of Evidence

Based on "How to use the evidence: assessment and application of scientific evidence" (National Health & Medical Research Council, Canberra, 2000):

Level I	Evidence obtained from a systematic review of all relevant randomised controlled trials.
Level II	Evidence obtained from at least one properly designed randomised controlled trial.
Level III-1	Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method).
Level III-2	Evidence obtained from comparative studies (including systematic reviews of such studies) with concurrent controls and allocation not randomized, cohort studies, case control studies, or interrupted time series with a control group.
Level III-3	Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group.
Level IV	Evidence obtained from case series, either post-test or pre-test/post-test.

APPENDIX 2

Search strategy

	Search terms for Cochrane Library, Medline, Premedline, CINAHL
1	Infant/
2	Infant\$.mp
3	Exp infant, low birth weight/ or low birth weight infant\$.mp
4	Infant, newborn/
5	Neonate\$.mp
6	or/1-5
7	Kangaroo mother care.mp or Exp Kangaroo care/
8	Kangaroo mother method.mp
9	Kangaroo care.mp
10	Skin to skin contact.mp
11	Or/7-10
12	6 and 11
13	Limit 12 to English language

<p style="text-align: center;">Evidence Summary Therapy/Intervention</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Is Kangaroo care better than standard care for low birth weight infants?</p> </div>	<p>Study 1</p> <p>Conde-Agudelo A, Diaz-Rossello JL, Belizan JM (2001). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants (Cochrane Review). In: The Cochrane Library, Issue 2. Oxford: Update Software.</p>
<p>STUDY DESIGN & NHMRC LEVELS OF EVIDENCE</p>	<p>Systematic review (Level I Evidence)</p>
<p>DESCRIPTION: Patients (subjects), Intervention, Comparisons, Outcomes, Inclusion & Exclusion Criteria</p>	<p>Patients (subjects): Infants with birth weight less than 2500 gm regardless of gestational age (LBW). Intervention: Kangaroo mother care (KMC) Comparison: Conventional care Outcomes:</p> <ul style="list-style-type: none"> ▪ Primary: mortality at 40 weeks' corrected gestational age, at 1 month after discharge, and at 6 months of age; severe illness; infant growth to discharge or 41 weeks' corrected gestational age; weight, weight gain, length and head circumference. ▪ Secondary: infection; moderate illness; mild illness; admission to neonatal intensive care unit (NICU); breastfeeding at discharge; length of hospital stay; readmission to hospital after discharge; costs of care; parent satisfaction; staff satisfaction; growth and neurodevelopment at one year; any other clinically relevant outcomes <p>Inclusion & Exclusion Criteria: All published, unpublished, and ongoing randomised trials utilizing random patient allocation, were eligible. Excluded quasi-random designs studies.</p>
<p>VALIDITY: Methodology, rigour, selection</p>	<p>Search strategy: Used the Neonatal Review Group of the Cochrane Collaboration standard search strategy. Medline, EMBASE, LILACS, POPLINE and CINAHL databases, and the Cochrane Controlled Trials Register (January 1982 to July 2000) were searched. Cross-references in published articles, conferences and symposia proceedings, and journal hand searching were performed. No language restrictions. Search terms were provided. Randomisation: The included studies in the review were all randomised controlled trials. Blinding: Methodological assessments were not conducted blind to author, institution, journal of publication or results and the reviewers were familiar with most of the studies. Validity: Assessed the validity of the included studies for quality.</p>
<p>RESULTS: Generally favourable or unfavourable, specific outcomes of interest, estimate of experimental effect and precision if appropriate</p>	<p>Nine trials of KMC for LBW were identified. Five non-randomised controlled trials were excluded and one was awaiting assessment. Three studies involving 1362 infants were included, and all were conducted in developing countries.</p> <ul style="list-style-type: none"> ▪ Mortality: No differences in infant mortality assessed from eligibility to 41 weeks' corrected gestational age, to discharge, or at 6-month follow-up. ▪ Infection (illness): KMC was associated with a reduced risk of nosocomial infection at 41 weeks' corrected gestational age (relative risk 0.49, 95% CI 0.25-0.93), severe illness (relative risk 0.30, 95% CI 0.14-0.67) and lower respiratory tract disease (relative risk 0.37, 95% CI 0.15-0.89) at 6 months follow-up. No evidence of a difference in severe infection at 41 weeks' corrected gestational age, diarrhoea, or mild or moderate illness at 6 months follow-up. ▪ Failure to establish breastfeeding: KMC reduced the likelihood of not exclusively breastfeeding at discharge (relative risk 0.41, 95% CI 0.25-0.68). No differences in exclusive breastfeeding at 41 weeks' corrected gestational age, or at 1 or 6 months follow-up. ▪ Re-admission to hospital: No evidence of a difference in re-admission to hospital at 41 weeks' corrected gestational age, or at 6 months follow-up. ▪ Growth: KMC infants had gained more weight per day by discharge than controls (weighted mean difference 3.6 g/day, 95% CI 0.8-6.4) although this difference is of low clinical significance. Sloan 1994 reported "there were no significant differences between the groups in growth indices during the 6-month follow-up". No differences were seen in weight, length, or head circumference at 41 weeks' corrected gestational age or in weight at discharge.

	<ul style="list-style-type: none"> ▪ Parental dissatisfaction: KMC reduced the likelihood of maternal dissatisfaction with method of care (relative risk 0.41, 95% CI 0.22-0.75). There was no evidence of a difference in paternal or family satisfaction with method of care. ▪ Mother's attachment behaviour: Overall scores on mother's sense of competence according to infant stay in hospital and admission to NICU were better in KMC than in control group (weighted mean differences 0.31 [95% CI 0.13-0.50] and 0.28 [95%CI 0.11-0.46], respectively). On the other hand, overall scores on mother's perception of social support according to infant stay in NICU were worse in KMC group than in control group (weighted mean difference -0.18, 95%CI -0.35 to -0.01). There were no differences in scores on mother's perception of social support according to infant stay in hospital and mother's feelings of worry and stress, mother's sensitivity, mother's responses to child's distress and socioemotional and cognitive growth fostering, and infant's response to the mother (clarity of cues and responsiveness) according to infant stay in hospital and admission to NICU. ▪ Other results: The mean hospital stay from randomization to 41 weeks' corrected gestational age was 4.5 days for KMC infants and 5.6 for control infants. The maximum saving in hospital stay was observed in infants weighing <1501 g at birth. Median hospital stay was 11 days in the KMC group and 13 days in the control group. Length of hospital stay was two days greater in KMC infants than control infants. The overall costs were "about 50% less for KMC. Costs of neonatal care were greater in the control than in the KMC group. However, data were available for only 49 infants (24 KMC, 25 control) at 6-month follow-up. .
<p>AUTHOR(S) CONCLUSIONS: Limitations, implications for practice and research</p>	<p>"Although KMC appears to reduce severe infant morbidity without any serious deleterious effect reported, there is still insufficient evidence to recommend its routine use in LBW infants. Well designed randomized controlled trials of this intervention are needed."</p>
<p>OUR COMMENTS: Opportunity for bias, weakness and strength</p>	<p>Potential for bias: Studies were assessed and graded independently by the two reviewers. Data were extracted independently and crosschecked by two reviewers. Differences were resolved by discussion and consensus. Statistical analysis was conducted using the standard Cochrane Collaboration methods. Planned subgroup analyses according to birthweight, gestational age and type of LBW, and sensitivity analysis according to methodological quality of trials and methods of meta-analysis, were not made due to the small number of trials contributing data and to the lack of data.</p> <p>Strengths:</p> <ul style="list-style-type: none"> ▪ Clear research question and outcome ▪ Clear inclusion and exclusion criteria were used ▪ Only randomised controlled trials were included in the review. ▪ Methodological criteria were used to appraise each study (concealment of treatment allocation, completeness of follow-up and blinding of assessment of outcome). ▪ Reviewer's attempted to identify and include both published and unpublished studies. <p>Weaknesses:</p> <ul style="list-style-type: none"> ▪ Most of the results in this review are based or originated from a single study. ▪ The included studies were all conducted in developing countries (not generalisable). The authors also feel that there were problems associated with blinding procedures for those who collected the outcomes measures, handling of dropouts, and completeness of follow-up. <p>In conclusion, we agree with the authors that there is not enough and strong evidence to recommend the routine use of KMC for LBW infants. Hence, a well-designed randomised controlled trial in developed countries is warranted.</p>

EXPLANATION OF TERMINOLOGY USED IN SPREADSHEET

Level of evidence: A hierarchy of study evidence that indicates the degree to which bias has been eliminated in the study design.

Intervention: A therapeutic procedure such as treatment with a pharmaceutical agent, surgery, a dietary supplement, a dietary change or psychotherapy.

Randomisation: A process of allocating participants to treatment or control group within a controlled trial by using a random mechanism, such as coin toss, random number table or computer-generated random numbers. Study subjects have an equal chance of being allocated to an intervention or control group; thus, the two groups are comparable. Randomisation ensures that the results are not biased by the selection of particular types of patients to receive a specific therapy.

Blinding: Blinding or masking is a process used in epidemiological studies and clinical trials in which the observers and the subjects have no knowledge as to which treatment groups subjects are assigned. It is undertaken in order to minimise bias occurring in patient response and outcome measurement.

Validity:

Of measurement: an expression of the degree to which a measurement measures what it purports to measure; it includes construct and content validity.

Of study: the degree to which the inferences drawn from the study are warranted when account is taken of the study methods, the representativeness of the study sample, and the nature of the population from which it is drawn (internal and external validity, applicability, generalisability).

Potential for bias: Bias is a systematic deviation of a measurement from the 'true' value leading to either an over (or under) estimation of the treatment effect. Bias can originate from many different sources (including allocation of patients, measurement, interpretation, publication and review of data).