A systematic review comparing continuity of midwifery care with standard maternity services

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Authors' objectives
To compare continuity of midwifery care with standard maternity services.

Searching
Computerised searches were made of the following: MEDLINE (1966 to 1997); CINAHL (1982 to 1997); Current Contents (Life Sciences/Clinical Medicine, 1993 to 1997) and Sociofile (1974 to 1997). Search terms were: midwife, care, pregnancy, alternative, birth, service, models of care, clinical-trial, and trial. Studies were also identified through scrutiny of Congress proceedings (International Congress of Midwifery) and through contact with investigators.

Study selection

Study designs of evaluations included in the review
Randomised controlled trials (RCTs) that compared continuity of midwifery care with standard maternity services were included if they analysed data on an intention-to-treat basis.

Specific interventions included in the review
The standard pattern of maternity care as practised in the place where the trial was conducted and continuity of care defined as that provided by a midwife or a small group of midwives from early pregnancy to the postnatal period were studied. The midwives were practising clinically across the three stages of pregnancy and childbirth. The definition of continuity of care was, of necessity, decided during an ongoing collaborative process. Elements in the care package varied between trials. Care givers varied from predominantly doctors, doctors/midwives mixed and predominately midwives.

Participants included in the review
Pregnant women who consented to be randomised to continuity of midwifery care or standard maternity services were included. Where reported, consent rates ranged from 81.9% to 95.3%, primiparae rates in treatment arms varied from 43% to 59%. Trials were conducted across five industrialised countries. Both low and high risk women were included with some overlap in these definitions between trials.

Outcomes assessed in the review
The following outcomes were assessed: obstetric interventions including induction, augmentation of labour, electronic foetal monitoring, obstetric analgesia (epidural, pethidine or other narcotics), and operative delivery (Caesarean section and instrumental vaginal delivery); maternal outcomes including episiotomy, perineal status, duration of labour, morbidity, mortality and satisfaction with care; and infant outcomes including admissions to intensive care or special care baby unit, Apgar score < 7 at 5 minutes and perinatal mortality. Interventions limited to intrapartum or ante-natal care were excluded.

How were decisions on the relevance of primary studies made?
The first investigator reviewed study titles, abstracts and, where necessary, the published reports of each study for inclusion/exclusion according to defined criteria with checking performed by the second author. Decisions on inclusion were based on collaboration between authors.

Assessment of study quality
Adequacy of concealment of randomisation was assessed. Data on validity criteria were extracted by the first author then checked by the second author.
Data extraction
The following data were extracted by the first author then checked by the second author: strategy for allocation concealment; number randomised; proportion of primiparae; loss to follow-up; entry criteria; and description of model of care. Odds ratios (OR) and 95% confidence intervals were calculated for each trial. Where necessary, authors of trials were contacted for additional information.

Methods of synthesis
How were the studies combined?
Pooled odds ratios (OR) and 95% confidence intervals were calculated for each trial using the fixed-effect Peto method (weighted by the inverse of the variance) where appropriate data was available. The fixed-effect model was used regardless of heterogeneity. Narrative review was used where it was not considered appropriate to combine data in a meta-analysis.

How were differences between studies investigated?
A chi-squared test for homogeneity was calculated for each outcome jointly for all trials.

Results of the review
Seven RCTs were included (N = 9148 women).

There were considerable differences between trials in the models of care. It was not always possible to assess the representativeness of the different samples.

Rates of induction were significantly lower in alternative models of care: OR = 0.76 (95%CI: 0.66, 0.86). Heterogeneity chi-squared = 7.00, P = 0.3. Rates of augmentation of labour were significantly lower in alternative models of care: OR = 0.78 (95%CI: 0.70, 0.87). Heterogeneity chi-squared = 30.20, P = 0.00004.

Electronic foetal monitoring was used less in alternative care: OR = 0.19 (95%CI: 0.17, 0.21). Heterogeneity chi-squared = 119.65, P < 0.00001.

Use of epidurals was less in alternative care models: OR = 0.76 (95%CI: 0.68, 0.85). Heterogeneity chi-squared = 12.97, P = 0.04.

Use of narcotics was less in alternative care models: OR = 0.69 (95%CI: 0.63, 0.77). Heterogeneity chi-squared = 59.91, P < 0.00001.

Rates of Caesarean section did not differ statistically between models: OR = 0.91 (95%CI: 0.78, 1.05). Heterogeneity chi-squared = 8.49, P = 0.2.

Instrumental vaginal delivery was significantly less in the alternative care model: OR = 0.82 (95%CI: 0.70, 0.95). Heterogeneity chi-squared = 4.41, P = 0.6.

Use of episiotomy was less frequent in the alternative model: OR = 0.69 (95%CI: 0.61, 0.77). Heterogeneity chi-squared = 14.26, P = 0.03.

Rates of perineal tears were less in alternative care models: OR = 1.15 (95%CI: 1.05, 1.26). Heterogeneity chi-squared = 11.83, P = 0.06.

Percent with intact perineum was similar in both care models: OR = 1.11 (95%CI: 1.00, 1.24). Heterogeneity chi-squared = 11.83, P = 0.06.

Proportion of babies with Apgar score < 7 at 5 minutes did not differ between care models: OR = 1.13 (95%CI: 0.69, 1.84). Heterogeneity chi-squared = 5.28, P = 0.3.

Rates of admission to intensive care or special care baby unit were not significantly different between care models: OR
Perinatal mortality was higher in the alternative care model, bordering on statistical significance: OR = 1.60 (95% CI: 0.99, 2.59). Heterogeneity chi-squared = 8.04, P = 0.1.

Duration of labour (6 studies): different measures were used and meta-analysis was not possible. The first stage of labour was longer in 5 of the studies with statistical significance reached in 2 studies. There appeared to be no obvious pattern for the second stage but 1 study reported this stage to be significantly longer in the intervention group.

Maternal deaths: none reported.

Other maternal outcomes: No statistically significant outcomes were reported for the following: postpartum haemorrhage; manual removal of placenta; antenatal admission to hospital; post-natal complications; and readmissions to hospital. 2 trials reported significantly shorter post partum hospital stay (by one day) in all groups.

Satisfaction with care was assessed by various measures. Findings were consistent with alternative care group reporting significantly greater satisfaction of care during all phases of pregnancy.

Cost information
Three trials considered costs with one considering costs in relation to the health services and the woman. 2 Australian trials reported reduced costs in the intervention group. 1 Scottish trial found similar costs for the ante and intrapartum period but increased costs for the postnatal period. Personal costs to the women were slightly reduced.

Authors’ conclusions
Continuity of midwifery care is associated with lower intervention rates than standard maternity care. No statistically significant differences were observed in maternal and infant outcomes. However more research is needed to make definite conclusions about safety, for the infant as well as the mother. This review illustrates the variation in the different models of alternative and standard maternity care, and thus the problems associated with pooling data from different trials.

CRD commentary
The aims and inclusion criteria were clearly stated. A thorough literature search was conducted. Details were given of methods used to select primary studies and extract data. Aspects of validity were assessed but only briefly, and heterogeneity was evaluated. Relevant information from individual studies and results were presented clearly and concisely in tabular format. Caution in interpretation was rightly advised by the authors in the light of the following limitations of the review: variation in the complex packages of care provided; variations in standard care reflecting differences in policies and organisation of maternity services between countries; models of care had a different focus for elements representing continuity of care; variation in provider skills; and differences in definitions of foetal monitoring, perinatal mortality and neonatal transfer. Given the heterogeneity among studies in some analysis it is debatable whether pooling these studies was appropriate.

As the authors state, caution is advised in the interpretation of these results in the light of statistical and clinical heterogeneity among trials.

Implications of the review for practice and research
Practice: The authors consider that these findings need to be conveyed to women in order for them to weigh up the benefits and costs while being clear about the limitations of current knowledge.

Research: The authors consider that more work is required in the following areas: use of consistent definitions; distinction between stillbirths before the onset of labour and intrapartum deaths; further investigation of the differences between groups in perinatal mortality; presentation of case histories and information about the cause of death; and synthesis of results across trials, if possible, in a way which takes account costs in the light of benefits.
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