Symphysis-fundal height measurement in pregnancy (Review)

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ABSTRACT

Background
In many settings, symphysis-fundal height measurement has replaced clinical assessment of fetal size by abdominal palpation because the latter has been reported to perform poorly.

Objectives
The objective of this review was to assess the effects of routine use of symphysis-fundal height measurements (tape measurement of the distance from the pubic symphysis to the uterine fundus) during antenatal care on pregnancy outcome.

Search strategy
Comprehensive electronic search of the Cochrane Pregnancy and Childbirth Group trials register (August 2002).

Selection criteria
Acceptably controlled trials comparing symphysis-fundal height measurement with assessment by abdominal palpation alone.

Data collection and analysis
One reviewer assessed trial quality and extracted data.

Main results
One trial involving 1639 women was included. No obvious differences were detected in any of the outcomes measured.

Authors' conclusions
There is not enough evidence to evaluate the use of symphysis-fundal height measurements during antenatal care.

PLAIN LANGUAGE SUMMARY

Too little evidence to show whether measuring the height of the pregnant belly at antenatal visits leads to better outcomes

Many pregnant women have the distance from the lowest part of their uterus (womb) (near the pubic bone) to the highest part of their uterus measured with a tape measure (symphysis fundal height). Their caregiver may also feel and gently press the outside of the woman's pregnant uterus (abdominal palpation). This is to check the baby's size and position, the quantity of fluid around the baby and to diagnose multiple pregnancy. The review found that there is too little evidence to show whether symphysis fundal height measurement during pregnancy is more beneficial than abdominal palpation. Further research is needed.

BACKGROUND

Tape measurement of symphysis-fundal height is simple, inexpensive, and widely used during antenatal care. The primary aim of the test is the detection of fetuses that are poorly grown but it also has the potential to facilitate the detection of multiple pregnancies and of fetuses that are unusually large. However, detection of fetuses that are unusually small, or large, or of unrecognised multiple pregnancies is only of importance if associated mortality or morbidity could be avoided, or if the process of care could be improved in a tangible way.

In many settings, symphysis-fundal height measurement has replaced clinical assessment of fetal size by abdominal palpation because the latter has been reported to perform poorly, in observational studies during routine antenatal care, in detecting fetuses that were small for gestational age at delivery - thus, detection rates between 30% and 50% have been described (Hall 1980; Rosenberg 1982). Although reported detection rates of small-for-dates babies from observational studies of symphysis-fundal height measurement appear somewhat better, these have varied greatly - between, for example, 56% (Rosenberg 1982) and 86% (Belizan 1978). In addition, it has been claimed that symphysis-fundal height cannot be measured by different observers with sufficient agreement to separate small fundal heights from those that are not small (Bailey 1989), thus severely limiting the use of the technique in antenatal clinics in which a woman is likely to see more than one clinician during the course of pregnancy.

OBJECTIVES

To assess whether the routine use of symphysis-fundal height measurement during antenatal care improves pregnancy outcome, compared to examination by abdominal palpation alone.

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

All acceptably controlled trials of symphysis-fundal height measurement during pregnancy, compared with abdominal palpation alone. Any future trial that compared symphysis-fundal height measurement with routine ultrasound measurements of the fetus would be included in the 'Ultrasound for fetal assessment in early pregnancy' review (Neilson 2003).

Types of participants

Pregnant women.

Types of intervention

Tape measurement of symphysis-fundal height.

Types of outcome measures

Primary outcomes: complications associated with fetal growth restriction ('IUGR') ie intrauterine death, intrapartum asphyxia ('fetal distress' in labour), and neonatal hypoglycaemia; complications associated with fetal macrosomia (cephalopelvic disproportion (caesarean section for failure to progress), shoulder dystocia); complications associated with multiple pregnancy (preterm delivery, perinatal mortality).

Secondary outcomes: other indices of maternal and perinatal mortality and morbidity; indices of obstetric care, including admission to hospital.

If possible, future reviews would include sub-group analyses based on the availability, or not, of ultrasound investigation of fetal growth and wellbeing.

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: methods used in reviews.

We searched the Cochrane Pregnancy and Childbirth Group trials register (August 2002).

The Cochrane Pregnancy and Childbirth Group's trials register is maintained by the Trials Search Co-ordinator and contains trials identified from:
1. quarterly searches of the Cochrane Central Register of Controlled Trials (CENTRAL);
2. monthly searches of MEDLINE;
3. handsearches of 30 journals and the proceedings of major conferences;
4. weekly current awareness search of a further 37 journals.

Details of the search strategies for CENTRAL and MEDLINE, the list of handsearched journals and conference proceedings, and the list of journals reviewed via the current awareness service can be found in the 'Search strategies for identification of studies' section within the editorial information about the Cochrane Pregnancy and Childbirth Group.

Trials identified through the searching activities described above are given a code (or codes) depending on the topic. The codes are linked to review topics. The Trials Search Co-ordinator searches the register for each review using these codes rather than keywords.

METHODS OF THE REVIEW

Reports of identified trials that appeared relevant to the objectives of the review were evaluated for inclusion. Both published and unpublished reports could be included. Attempts would be made

to translate identified, non-English language reports. Primary authors would be contacted for additional details when necessary. Reasons for excluding apparently relevant trials are made explicit.

Included trials were assessed according to the following criteria:
(1) adequate concealment of treatment allocation (eg sealed, opaque, numbered envelopes);
(2) method of allocation to treatment (eg by computer randomisation, random number tables);
(3) adequate documentation of how exclusions were handled after treatment allocation - to facilitate 'intention to treat' analyses;
(4) adequate blinding of outcome assessment, where appropriate;
(5) losses to follow-up (trials with losses of > 25% will be excluded).

Data were entered directly from reports into the Review Manager software (RevMan 2000) and statistical analysis performed. For dichotomous data, relative risks (RRs) and 95% confidence intervals (CIs) were calculated. Weighted mean differences (WMDs) and 95% CIs were calculated for continuous data.

Heterogeneity between trials would be tested using a standard chi squared test. In the presence of significant heterogeneity, a sensitivity analysis would explore the influence of high quality trials (fulfilling the criteria above) compared to those of lesser quality.

DESCRIPTION OF STUDIES

A single trial involving 1639 women was included. See 'Characteristics of included studies' for details.

METHODOLOGICAL QUALITY

The method of randomisation permitted the risk of selection bias.

RESULTS

For ease of reading, those primary outcomes for which no data are available have not been listed in the summary graphs. There was no evidence of improved outcome from symphysis-fundal height measurements in this small trial.

DISCUSSION

Tape measurement of symphysis-fundal height is simple, inexpensive and widely used during antenatal care. This is the only known attempt to evaluate this method in a randomised trial, and it therefore deserves attention despite the small size of the study. The antenatal identification of babies that were of low birthweight for gestational age was much lower in the symphysis-fundal height group (28%) than in the abdominal palpation group (48%); it is also much lower than that reported in many previous observational studies. It is difficult to understand why that should be.

AUTHORS' CONCLUSIONS

Implications for practice

It would seem unwise to abandon the use of symphysis-fundal height measurement unless a much larger trial likewise suggests that it is unhelpful.

Implications for research

Clear guidance about the value of symphysis-fundal height measurement in routine antenatal care requires a much larger trial than has been performed to date.

NOTES

A new protocol to update the 'Symphysis-fundal height measurement in pregnancy' review is currently being prepared by a new review team. The title of the new protocol will be 'Symphysial fundal height measurement (SFH) in pregnancy for detecting abnormal fetal growth'.

POTENTIAL CONFLICT OF INTEREST

None known.

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None

SOURCES OF SUPPORT

External sources of support

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REFERENCES

References to studies included in this review

Copenhagen 1990 *{published data only}*

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Belizan 1978

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RevMan 2000

The Cochrane Collaboration. Review Manager (RevMan). 4.1 for Windows. Oxford, England: The Cochrane Collaboration, 2000.

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TABLES

Characteristics of included studies

Study	Copenhagen 1990
Methods	Sealed, opaque, but unnumbered envelopes containing a project number - an odd number resulted in allocation to the experimental group; an even number to the control group.
Participants	Pregnant women usually at around 14 weeks of pregnancy. After allocation, 21 women with twin pregnancies were withdrawn as were 13 women with uncertain dates, and 60 because antenatal care took place elsewhere.
Interventions	Symphysis-fundal height measurements routinely performed from 28 weeks and the results plotted on a locally derived centile chart. Control group women had observations made with a fabric strip without a measurement scale.
Outcomes	Indices of obstetric care and fetal outcome.
Notes	
Allocation concealment	C – Inadequate

ANALYSES

Comparison 01. Routine symphysis-fundal height measurement

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
11 Perinatal mortality	1	1639	Peto Odds Ratio 95% CI	1.25 [0.38, 4.08]
12 Apgar score < 4 (1 minute)	1	1639	Peto Odds Ratio 95% CI	0.93 [0.38, 2.31]
13 Apgar score < 4 (5 minutes)	1	1639	Peto Odds Ratio 95% CI	1.04 [0.26, 4.17]
14 Umbilical artery pH < 7.15	1	397	Peto Odds Ratio 95% CI	0.67 [0.39, 1.16]
15 Admission neonatal unit	1	1639	Peto Odds Ratio 95% CI	1.07 [0.69, 1.65]
16 Antepartum hospitalization for 'IUGR'	1	1639	Peto Odds Ratio 95% CI	1.93 [0.85, 4.39]
17 Labour induction for 'IUGR'	1	1639	Peto Odds Ratio 95% CI	0.84 [0.44, 1.59]
18 Caesarean section for 'IUGR'	1	1639	Peto Odds Ratio 95% CI	0.72 [0.31, 1.67]
19 Birthweight <10th centile	1	1639	Peto Odds Ratio 95% CI	1.34 [0.91, 1.98]

INDEX TERMS

Medical Subject Headings (MeSH)

*Anthropometry; *Embryonic and Fetal Development; Gastric Fundus; Pubic Symphysis

MeSH check words

Female; Humans; Pregnancy

COVER SHEET

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GRAPHS AND OTHER TABLES

Analysis 01.11. Comparison 01 Routine symphysis-fundal height measurement, Outcome 11 Perinatal mortality

Review: Symphysis-fundal height measurement in pregnancy
Comparison: 01 Routine symphysis-fundal height measurement
Outcome: 11 Perinatal mortality

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	6/804	5/835		100.0	1.25 [0.38, 4.08]
Total (95% CI)	804	835		100.0	1.25 [0.38, 4.08]
Total events: 6 (Treatment), 5 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.37 p=0.7					

Analysis 01.12. Comparison 01 Routine symphysis-fundal height measurement, Outcome 12 Apgar score < 4 (1 minute)

Review: Symphysis-fundal height measurement in pregnancy
Comparison: 01 Routine symphysis-fundal height measurement
Outcome: 12 Apgar score < 4 (1 minute)

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	9/804	10/835		100.0	0.93 [0.38, 2.31]
Total (95% CI)	804	835		100.0	0.93 [0.38, 2.31]
Total events: 9 (Treatment), 10 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.15 p=0.9					

Analysis 01.13. Comparison 01 Routine symphysis-fundal height measurement, Outcome 13 Apgar score < 4 (5 minutes)

Review: Symphysis-fundal height measurement in pregnancy
Comparison: 01 Routine symphysis-fundal height measurement
Outcome: 13 Apgar score < 4 (5 minutes)

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	4/804	4/835		100.0	1.04 [0.26, 4.17]
Total (95% CI)	804	835		100.0	1.04 [0.26, 4.17]
Total events: 4 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.05 p=1					

Analysis 01.14. Comparison 01 Routine symphysis-fundal height measurement, Outcome 14 Umbilical artery pH < 7.15

Review: Symphysis-fundal height measurement in pregnancy
Comparison: 01 Routine symphysis-fundal height measurement
Outcome: 14 Umbilical artery pH < 7.15

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	25/196	36/201		100.0	0.67 [0.39, 1.16]
Total (95% CI)	196	201		100.0	0.67 [0.39, 1.16]
Total events: 25 (Treatment), 36 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.42 p=0.2					

Analysis 01.15. Comparison 01 Routine symphysis-fundal height measurement, Outcome 15 Admission neonatal unit

Review: Symphysis-fundal height measurement in pregnancy

Comparison: 01 Routine symphysis-fundal height measurement

Outcome: 15 Admission neonatal unit

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	43/804	42/835		100.0	1.07 [0.69, 1.65]
Total (95% CI)	804	835		100.0	1.07 [0.69, 1.65]

Total events: 43 (Treatment), 42 (Control)

Test for heterogeneity: not applicable

Test for overall effect z=0.29 p=0.8

Analysis 01.16. Comparison 01 Routine symphysis-fundal height measurement, Outcome 16 Antepartum hospitalization for 'IUGR'

Review: Symphysis-fundal height measurement in pregnancy

Comparison: 01 Routine symphysis-fundal height measurement

Outcome: 16 Antepartum hospitalization for 'IUGR'

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	15/804	8/835		100.0	1.93 [0.85, 4.39]
Total (95% CI)	804	835		100.0	1.93 [0.85, 4.39]

Total events: 15 (Treatment), 8 (Control)

Test for heterogeneity: not applicable

Test for overall effect z=1.56 p=0.1

Analysis 01.17. Comparison 01 Routine symphysis-fundal height measurement, Outcome 17 Labour induction for 'IUGR'

Review: Symphysis-fundal height measurement in pregnancy

Comparison: 01 Routine symphysis-fundal height measurement

Outcome: 17 Labour induction for 'IUGR'

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	17/804	21/835		100.0	0.84 [0.44, 1.59]
Total (95% CI)	804	835		100.0	0.84 [0.44, 1.59]

Total events: 17 (Treatment), 21 (Control)

Test for heterogeneity: not applicable

Test for overall effect z=0.54 p=0.6

Analysis 01.18. Comparison 01 Routine symphysis-fundal height measurement, Outcome 18 Caesarean section for 'IUGR'

Review: Symphysis-fundal height measurement in pregnancy

Comparison: 01 Routine symphysis-fundal height measurement

Outcome: 18 Caesarean section for 'IUGR'

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	9/804	13/835		100.0	0.72 [0.31, 1.67]
Total (95% CI)	804	835		100.0	0.72 [0.31, 1.67]
Total events: 9 (Treatment), 13 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.77 p=0.4					

Analysis 01.19. Comparison 01 Routine symphysis-fundal height measurement, Outcome 19 Birthweight <10th centile

Review: Symphysis-fundal height measurement in pregnancy

Comparison: 01 Routine symphysis-fundal height measurement

Outcome: 19 Birthweight <10th centile

Study	Treatment n/N	Control n/N	Peto Odds Ratio 95% CI	Weight (%)	Peto Odds Ratio 95% CI
Copenhagen 1990	61/804	48/835		100.0	1.34 [0.91, 1.98]
Total (95% CI)	804	835		100.0	1.34 [0.91, 1.98]
Total events: 61 (Treatment), 48 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.49 p=0.1					