

# Position in the second stage of labour for women without epidural anaesthesia (Review)

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## ABSTRACT

### Background

For centuries, there has been controversy around whether being upright (sitting, birthing stools, chairs, squatting) or lying down have advantages for women delivering their babies.

### Objectives

To assess the benefits and risks of the use of different positions during the second stage of labour (i.e. from full dilatation of the cervix).

### Search strategy

We searched the Cochrane Pregnancy and Childbirth Group Trials Register (30 September 2005).

### Selection criteria

Trials that used randomised or quasi-randomised allocation and appropriate follow up and compared various positions assumed by pregnant women during the second stage of labour.

### Data collection and analysis

We independently assessed the trials for inclusion and extracted the data.

### Main results

Results should be interpreted with caution as the methodological quality of the 20 included trials (6135 participants) was variable. Use of any upright or lateral position, compared with supine or lithotomy positions, was associated with: reduced duration of second stage of labour (9 trials: mean 4.28 minutes, 95% confidence interval (CI) 2.93 to 5.63 minutes) - this was largely due to a considerable reduction in women allocated to the use of the birth cushion; a small reduction in assisted deliveries (19 trials: relative risk (RR) 0.80, 95% CI 0.69 to 0.92); a reduction in episiotomies (12 trials: RR 0.83, 95% CI 0.75 to 0.92); an increase in second degree perineal tears (11 trials: RR 1.23, 95% CI 1.09 to 1.39); increased estimated blood loss greater than 500 ml (11 trials: RR 1.63, 95% CI 1.29 to 2.05); reduced reporting of severe pain during second stage of labour (1 trial: RR 0.73, 95% CI 0.60 to 0.90); fewer abnormal fetal heart rate patterns (1 trial: RR 0.31, 95% CI 0.08 to 0.98).

### Authors' conclusions

The tentative findings of this review suggest several possible benefits for upright posture, with the possibility of increased risk of blood loss greater than 500 ml. Women should be encouraged to give birth in the position they find most comfortable. Until such time as the benefits and risks of various delivery positions are estimated with greater certainty, when methodologically stringent trials' data are available, women should be allowed to make informed choices about the birth positions in which they might wish to assume for delivery of their babies.

## PLAIN LANGUAGE SUMMARY

Women should be encouraged to give birth in comfortable positions, which are usually upright

In traditional cultures, women naturally give birth in upright positions like kneeling, standing etc. In western societies, doctors have influenced women to give birth on their backs, sometimes with their legs up in stirrups. The review of trials found the studies were not of good quality, but they showed that when women gave birth on their backs it was more painful for the mother and caused more problems with the baby's heartbeat. More women needed help from doctors using forceps and more had cuts to the birth outlet, but there was less blood loss. More research is needed.

## BACKGROUND

The position adopted naturally by women during birth has been described as early as 1882 by Engelmann (Engelmann 1882). He observed that 'primitive' women, not influenced by Western conventions, would try to avoid the dorsal position and would be allowed to change position as and when they wished. Different upright positions could be achieved using posts, slung hammocks, furniture, holding on to ropes or knotted pieces of cloth, kneeling, crouching or squatting using bricks, stones, a pile of sand, or a birth stool (Engelmann 1882; Jarcho 1934). Today, the majority of women in Western societies deliver in a dorsal, semi-recumbent or lithotomy position. It is claimed that the dorsal position enables the midwife/obstetrician to monitor the fetus better and thus to ensure a safe birth.

The position assumed by women during birth is influenced by several complex factors. 'Instinctive' behaviour is difficult to identify because behaviour is strongly influenced by cultural norms. For societies in which the majority of births take place within a medical facility, cultural norms have over the years been moulded by the expectations and demands of medical attendants, as well as restrictions imposed by medical procedures such as fetal monitoring, intravenous therapy, analgesia including regional analgesia, medical examinations and medical procedures. During the second stage of labour, practices such as perineal support and assistance of the birth during 'spontaneous' delivery have restricted options for positions assumed by women. Options for instrumental delivery are also limited.

The influence of medical personnel and institutions over the positions adopted by women during labour and birth has been viewed as inconsiderate of women's comfort and need to experience birth as a positive event, disempowering, abusive and humiliating. In view of indirect evidence that a positive, supportive labour environment promotes a sense of competence and personal achievement experienced by women during childbirth, and their subsequent confidence as mothers and risk of postnatal depression, serious attention should be given to medical practices which may undermine or humiliate women during labour.

There is controversy around whether being upright or lying down has advantages for women delivering their babies. Several physiological advantages have been claimed for non-recumbent or upright labour: (i) the effects of gravity, (ii) lessened risk of aortocaval compression and improved acid-base outcomes in the new-

borns (Ang 1969; Humphrey 1974; Scott 1963), (iii) stronger and more efficient uterine contractions (Caldeyro-Barcia 1960; Méndez-Bauer 1975), (iv) improved alignment of the fetus for passage through the pelvis ('drive angle') (Gold 1950), and (v) radiological evidence of larger antero-posterior (Borell 1957b) and transverse (Russell 1969) pelvic outlet diameters, resulting in an increase in the total outlet area in the squatting (Gupta 1991; Lilford 1989; Russell 1982) and kneeling positions (Russell 1982).

The supine or semi-recumbent position for birth is widely used in contemporary obstetric practice. The main advantage cited is easy access of the caregiver to the woman's abdomen to monitor the fetal heart rate. Caregivers are comfortable with the dorsal position as it is the position in which they have usually been trained to conduct deliveries, including assisted vaginal deliveries, and is the conventional reference position for textbook descriptions of the mechanisms of vaginal delivery.

The lithotomy position with the woman's legs fixed in stirrups is used in many institutions both for spontaneous and particularly for assisted vaginal deliveries. The use of stirrups may be combined with lateral pelvic tilting and a semi-recumbent posture with the mother sitting up at about 45 degrees, to reduce aortocaval compression.

The lateral recumbent position is also used for both spontaneous and assisted deliveries, with the advantage of avoiding uterine compression of the aorta and/or the inferior vena cava.

Kneeling positions may also be assumed by women in the second stage of labour. These may vary from upright kneeling to an 'all fours' position with the pelvis and shoulders at the same level.

A supported standing position was promoted by Odent in Pithiviers, France in the 1980s, but has not to our knowledge been evaluated systematically.

The McRoberts' position with hyperflexed thighs was introduced to overcome shoulder dystocia. It has been shown to increase the expulsive force in the second stage of labour (Buhimschi 2001).

Delivery in a birthing chair has been studied, but most of these studies have involved small sample sizes (Dunn 1978). There are conflicting data on the possible advantages and disadvantages of using a birthing chair for delivery.

The squatting position is often termed the most natural position and is often used by women if left alone to choose their own position for birth (Kurokawa 1985; Romond 1985). However,

the major disadvantage of the squatting position is that Western women may not have the appropriate muscular fitness and stamina to remain squatting for a considerable length of time, and that it may increase perineal trauma. This may be particularly true of Western women who no longer squat to defecate. In one study in Leeds, UK, only 16% of women allocated to squatting managed to do so, despite antenatal exercises (Gupta 1989). In many parts of Asia, Africa and Americas, people customarily work and rest in this posture. The deep squat is very similar to the habitual resting position of the chimpanzee and perhaps all of us might have squatted at some stage of our lives if our custom did not train us to adopt other postures (Hewes 1957). Consequently, the advent of a supported squatting position during delivery, either using a birthing cushion or stool, seems attractive.

Our aim is to evaluate the available evidence about the effectiveness, benefits and possible disadvantages for the use of different positions during the second stage of labour.

## OBJECTIVES

To determine the possible benefits and risks of the use of different birth positions during the second stage of labour on maternal, fetal, neonatal and caregiver outcomes.

The various positions can be broadly categorised as being either neutral or upright (Atwood 1976). The neutral positions, in which a line connecting the centre of a woman's third and fifth vertebrae is more horizontal than vertical, which are generally used in modern Western obstetrics, are namely:

- (1) lateral (Sim's) position;
- (2) lithotomy position;
- (3) Trendelenburg's position (head lower than pelvis); and
- (4) knee-elbow (all fours) position.

There are distinct upright positions (with gravity involved), namely:

- (1) sitting (obstetric chair/stool);
- (2) semi-recumbent (trunk tilted backwards 30° to the vertical);
- (3) kneeling;
- (4) squatting (unaided or using squatting bars); and
- (5) squatting (aided with Birth cushion).

Comparisons between any two of the above positions may be included.

## CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

### Types of studies

Any randomised controlled trial that:

1. uses random or quasi-random allocation and appropriate follow up;

2. compares the positions listed under objectives.

### Types of participants

Pregnant women during the second stage of labour irrespective of choice of analgesia after randomisation.

### Types of intervention

The main comparison is the use of any upright or lateral position during the second stage of labour compared with supine or lithotomy positions. Secondary comparisons include comparison of different upright positions and the lateral position.

### Types of outcome measures

#### Maternal outcomes

- (1) Pain;
- (2) use of all analgesia/anaesthesia;
- (3) uterine efficiency (contraction intensity, frequency);
- (4) blood pressure;
- (5) duration of labour (primigravidae, multigravidae, all women);
- (6) mode of delivery (assisted delivery, caesarean section);
- (7) trauma to the birth canal that required suturing;
- (8) blood loss greater than 500 ml;
- (9) long-term perineal pain/discomfort;
- (10) dyspareunia;
- (11) urinary/faecal incontinence;
- (12) maternal experience of and satisfaction with second stage of labour.

#### Fetal outcomes

- (1) Abnormal fetal heart rate patterns needing intervention;
- (2) persistent occipito-posterior position at birth.

#### Neonatal outcomes

- (1) Neonatal condition;
- (2) admission to neonatal intensive care unit;
- (3) perinatal death.

## SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: methods used in reviews.

We searched the Cochrane Pregnancy and Childbirth Group Trials Register by contacting the Trials Search Co-ordinator (30 September 2005).

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.

We contacted authors of published and unpublished trials for additional information when necessary.

## METHODS OF THE REVIEW

We independently assessed the trials. We knew the names of the authors, institutions and journal of publication on assessment. We evaluated trials under consideration for methodological quality and appropriateness for inclusion, without consideration of their results and we processed included trial data as described in Higgins 2005. Disagreement would have been resolved by discussion with a member of the editorial board.

Four major sources of potential bias and methods for avoidance of these biases were considered when assessing trial quality:

### Selection bias - blinding of randomisation

We assigned a quality score for each trial, using the following criteria:

- (A) adequate concealment of allocation: such as telephone randomisation, consecutively numbered sealed opaque envelopes;
- (B) unclear whether adequate concealment of allocation: such as list or table used, sealed envelopes, or study does not report any concealment approach;
- (C) inadequate concealment of allocation: such as open list of random number tables, use of case record numbers, dates of birth or days of the week.

### Performance bias - blinding of participants, researchers and outcome assessment

We assessed blinding using the following criteria:

- (1) blinding of participants (yes/no/unclear);
- (2) blinding of caregiver (yes/no/unclear);
- (3) blinding of outcome assessment (yes/no/unclear).

### Attrition bias - loss of participants, e.g. withdrawals, dropouts, protocol deviations

We assessed completeness to follow up using the following criteria:

- (A) less than 5% loss of participants;
- (B) 5% to 9.9% of loss of participants;
- (C) 10% to 19.9% loss of participants;
- (D) more than 20% loss of participants.

### Measures of treatment effect

We carried out statistical analysis using the Review Manager software (RevMan 2003). We used fixed-effect meta-analysis for combining data in the absence of significant heterogeneity if trials were sufficiently similar. If heterogeneity was found this was explored by sensitivity analysis followed by random effects when required.

Dichotomous data: we have presented the results as summary relative risk with 95% confidence intervals.

Continuous data: we have use the weighted mean difference if outcomes were measured in the same way between trials. We used the standardised mean difference to combine trials that measure the same outcome, but use different methods. If there was evidence of skewness, this would be reported.

### Assessment of heterogeneity

We have applied tests of heterogeneity between trials, when appropriate, using the  $I^2$  statistic. When high levels of heterogeneity among the trials was identified (exceeding 50%), we explored it by performing a sensitivity analysis. A random-effects meta-analysis was used as an overall summary if this was considered appropriate.

### Sensitivity analysis

We have performed the following sensitivity analysis for any upright or lateral position versus supine position or lithotomy: by trial quality assessed by concealment of allocation; by excluding trials with clearly inadequate allocation concealment (rated C).

### Subgroup analyses

We have performed the following subgroup analyses based on: duration of second stage of labour: primigravid women compared to parous women.

## DESCRIPTION OF STUDIES

Twenty trials (35 publications) have been included in this review. Seven recruited only nulliparous women; nine stated that they recruited both parous and nulliparous; and parity was not mentioned in the remaining four trials. The majority of the trials included women at more than 36 weeks' gestation with no obstetric or medical complications. Exceptions were Crowley 1991, who included women at 34 weeks gestation, and Hemminki 1986, who included women at 35 weeks gestation.

Six trials compared the use of a birthing chair versus recumbent or semi recumbent (three trials) (Crowley 1991; Hemminki 1986; Hillan 1984); dorsal position (two trials) (Stewart 1989; Turner 1986); or supine position (one trial) (Liddell 1985). Seven trials compared squatting versus recumbent or semi recumbent (four trials) (Gardosi 1989a; Gardosi 1989b; Gupta 1989; Radkey 1991); lithotomy (two trials) (Bhardwaj 1994; Racinet 1999); or supine (one trial) (Allahbadia 1992). Two trials compared the use of a



birthing stool versus semi-recumbent position (one trial) (Waldenstrom 1991); or supine (one trial) (de Jong 1997). Three trials compared sitting upright versus supine (Chan 1963; Marttila 1983; Suwanakam 1988) and two trials compared the left lateral position with supine (Johnstone 1987) or dorsal (Humphrey 1973).

Five trials (Bhardwaj 1994; de Jong 1997; Gardosi 1989a; Gardosi 1989b; Hillan 1984) allowed all randomised women to be ambulant throughout the first stage of labour, two trials (Allahbadia 1992; Chan 1963) only for those randomised to the intervention. The remaining trials did not mention this in the papers.

Outcomes reported by most studies were maternal use of analgesia or anaesthesia, duration of second stage of labour, mode of delivery, perineal tears or episiotomy, and blood loss greater than 500 ml.

See the tables of 'Characteristics of included studies' and 'Characteristics of excluded studies' for details of the individual studies.

## METHODOLOGICAL QUALITY

Eleven trials were excluded either because of insufficient data presented in the report (six trials), women received an epidural prior to randomisation (two trials), multiple numbers of women excluded from the analysis (one trial), intervention not continued into the active phase of labour (one trial) or not a randomised trial (one trial).

Allocation concealment was adequate by description in three trials (Crowley 1991; de Jong 1997; Gupta 1989). Seven trials (Heminki 1986; Hillan 1984; Johnstone 1987; Liddell 1985; Stewart 1989; Turner 1986; Waldenstrom 1991) used sealed envelopes that were not described as opaque (B - unclear). For three trials (Allahbadia 1992; Humphrey 1973; Marttila 1983) inadequate information was provided in the paper and therefore classified as B - unclear. The remaining seven trials (Bhardwaj 1994; Chan 1963; Gardosi 1989a; Gardosi 1989b; Suwanakam 1988) used quasi randomisation (C - inadequate) or Zelen randomisation (C - inadequate) (Racinet 1999; Radkey 1991). Due to the nature of the intervention, it was not possible for the women or carers to be blinded.

The majority of trials (11) randomly allocated women as late in the first stage of labour as possible or at full cervical dilatation. In the remaining trials, randomisation took place on admission. One trial (Gupta 1989) randomly allocated women at 30 weeks' gestation and asked the study group to attend special parentcraft classes for supervised leg exercises.

Observer bias may have been introduced to varying degrees during the process of initial selection of participants for studies contributing to this review. Principal outcome measures and sample-size calculation were reported in the minority of these trials. The principal outcome measures may have been affected as some trials

excluded participants following randomisation. It is also important to note that some of the women allocated to assume an upright position had difficulty in doing so.

Overall the quality of the included studies was poor and, therefore, the conclusions must be regarded as tentative.

## RESULTS

Twenty studies (6135 participants) have been included. We found that in most of the trials the data are not normally distributed with varying amounts of skew. We have analysed the data as they stand and would therefore advise that the results may be unreliable. We have performed sensitivity analysis by excluding trials of poor quality (rated C) for the comparison any upright or lateral position compared with supine or lithotomy position. A random-effects meta-analysis has been used as an overall summary when considered appropriate.

### Any upright or lateral position compared with supine or lithotomy position

#### *Duration of second stage*

For all women allocated to upright or lateral positions the duration of the second stage of labour was reduced by a mean of 4.28 minutes (95% confidence interval (CI) 2.93 to 5.63 minutes). However, there was significant heterogeneity between the nine trials which included 3211 women. When performing sensitivity analysis and excluding the four poor quality trials the findings do not remain significant (five trials; weighted mean difference (WMD) 0.49 CI -1.42 to 2.41). For primigravidae women only, duration of the second stage of labour was reduced by a mean of 3.35 minutes (CI 1.62 to 5.08 minutes). However, there was significant heterogeneity between the eight trials. When performing sensitivity analysis and excluding the four poor-quality trials, the findings do not remain significant (four trials; WMD 0.73 CI -1.32 to 2.79).

#### *Mode of delivery*

There was a small reduction in assisted deliveries (19 trials: relative risk (RR) 0.80, 95% CI 0.69 to 0.92). However, there was significant heterogeneity between the trials. When performing sensitivity analysis and excluding the four poor quality trials the findings do not remain significant (twelve trials; RR 0.85 CI -0.72 to 1.02).

#### *Episiotomy and perineal tears*

Fewer episiotomies were performed in the upright group of women (12 trials: RR 0.83, 95% CI 0.75 to 0.92). When performing sensitivity analysis and excluding the three poor-quality trials the findings remain significant. This was partly offset by an increase in second-degree perineal tears (11 trials: RR 1.23, 95% CI 1.09 to 1.39). When performing sensitivity analysis and excluding the four poor quality trials, the findings remain significant.

#### *Blood loss*

Blood loss greater than 500 ml based on estimation of blood loss was more common in women allocated to the upright or lateral position (11 trials: RR 1.63, 95% CI 1.29 to 2.05). The result remains significant after excluding four trials based on trial quality.

#### ***Women's experience of pain***

Fewer women in the upright or lateral position reported experiencing severe pain at birth (RR 0.73, 95% CI 0.60 to 0.90).

#### ***Fetal heart rate patterns***

Fewer abnormal fetal heart rate patterns were recorded (RR 0.28, 95% CI 0.08 to 0.98).

No significant differences were demonstrated for analgesia or anaesthesia use during second stage of labour (seven trials); duration of the second stage of labour for multigravidae women (three trials); caesarean section (13 trials); third or fourth degree perineal tears (four trials); blood transfusion (two trials); uterine contraction frequency (one trial); manual removal of the placenta (three trials); unpleasant birth experience (one trial); dissatisfaction with second stage of labour (one trial); feeling out of control (one trial); admission to neonatal intensive care unit (two trials); birth injuries (one trial); perinatal death (three trials). Performing sensitivity analysis on the above outcomes by excluding trials based on trial quality did not alter the results significantly.

#### **Birth or squatting stool compared with supine position**

##### ***Duration of second stage***

The effect of the use of a birth or squatting stool on the duration of the second stage of labour could not be determined as no trial reported this outcome.

##### ***Episiotomy and perineal tears***

Fewer episiotomies were performed (two trials: RR 0.70, 95% CI 0.53 to 0.94) and more second degree perineal tears occurred (two trials: RR 3.26, 95% CI 1.60 to 6.64) for those women randomised to a birthing or squatting stool.

##### ***Blood loss***

Estimated blood loss greater than 500 ml was increased (two trials: RR 2.43, 95% CI 1.24 to 4.79) in women using the birth or squatting stool.

##### ***Women's experience of pain***

Fewer women randomised to the squatting stool reported experiencing severe pain at birth (one trial: RR 0.73, 95% CI 0.60 to 0.90).

##### ***Fetal heart rate patterns***

Fewer abnormal fetal heart rate patterns were also detected (one trial: RR 0.28, 95% CI 0.08 to 0.98).

No significant differences were demonstrated for analgesia or anaesthesia use during second stage of labour (two trials); assisted delivery (three trials); caesarean section (three trials); third or fourth degree tears (two trials); need for blood transfusion (one

trial); manual removal of placenta (one trial); dissatisfaction with second stage of labour (one trial); admission to neonatal intensive unit (one trial); birth injuries (one trial); and perinatal death (one trial).

#### **Lateral compared with supine position**

Two trials reported this outcome. No significant differences were demonstrated for the duration of the second stage of labour for all women, assisted deliveries or episiotomies.

#### **Birth cushion compared with supine or lithotomy position**

##### ***Duration of second stage***

Women allocated to use of the birth cushion had considerably shorter second stages of labour, both trials were of poor quality and high levels of heterogeneity were present, therefore random effects analysis was used (two trials: 15.2 minutes, 95% CI 7.5 to 22.9).

##### ***Mode of delivery***

There were fewer assisted deliveries (two trials: RR 0.50, 95% CI 0.32 to 0.78).

##### ***Episiotomy and perineal tears***

A similar rate of episiotomies (one trial: RR 0.99, 95% CI 0.71 to 1.36), and third/fourth degree tears (one trial; RR 1.10 CI 0.16 to 7.75), fewer second degree perineal tears (two trials: RR 0.72, 95% CI 0.54 to 0.97).

##### ***Blood loss***

The rate of estimated blood loss greater than 500 ml was not significantly different in either group (two trials: RR 1.00, 95% CI 0.54 to 1.88).

#### **Birth chair compared with supine or lithotomy position**

##### ***Duration of second stage***

No significant difference was found in the duration of the second stage of labour (three trials: an increase of 0.22 minutes, 95% CI reduction of 1.83 to increase of 2.26).

##### ***Episiotomy and perineal tears***

Using a random-effects analysis due to the high levels of heterogeneity, no significant differences were found in rates of episiotomy (four trials: RR 0.80, 95% CI 0.63 to 1.01); however, second degree perineal tears were increased for those women using the birth chair (RR 1.36, 95% CI 1.17 to 1.57).

##### ***Blood loss***

Estimated blood loss greater than 500 ml was also increased for this group of women (four trials: RR 1.90, 95% CI 1.37 to 2.62).

##### ***Mode of delivery***

No significant differences were demonstrated for mode of delivery (assisted delivery: RR 0.74, CI 0.46 to 1.50; caesarean section: RR 1.29, CI 0.50 to 3.32).

## DISCUSSION

Because of variable trial quality, inconsistencies within trials, and heterogeneity of participants, the results should be interpreted with caution. Furthermore, as blinding was not possible, negative or positive attitudes of caregivers to new techniques might influence results. The modest overall reduction in duration of second stage of labour (4.3 minutes) was contributed mainly by a large reduction in the two trials of the birth cushion (15.2 minutes). No significant difference was shown with the birth chair or lateral positions. Data were not available for the birth or squatting stool.

The modest reduction in assisted deliveries (RR 0.80) was due mainly to the reduction in women allocated to the use of the birth cushion (RR 0.50) and other upright positions, while use of the birth stool showed no effect and results with the birth chair were variable.

The considerable reduction in episiotomy usage was found in women allocated to the birth stool, and was only partly offset by an increase in second degree perineal tears.

Taken together, the reduction in the duration of second stage of labour and rates of assisted delivery and episiotomy lend support to the concept that second stage bearing down is more efficient in upright positions.

The increased diagnosis of blood loss greater than 500 ml, particularly in women allocated to any upright or lateral position, use of birth stool or squat stool, should be interpreted with caution because estimation of blood loss may be influenced by the fact that blood loss in the stool is collected in a receptacle.

## AUTHORS' CONCLUSIONS

### Implications for practice

With the possible exception of increased blood loss, no deleterious effects to the mother or fetus of delivery in the upright posture have been demonstrated. The current evidence on the effectiveness of various delivery positions is inconclusive. In light of this, it is suggested that women should be encouraged to deliver in whichever position is most comfortable for them, although this review did not look at this specifically.

### Implications for research

In view of the variable quality of the trials reviewed, further trials using well-designed protocols are needed. These should include

a measure of the skill, confidence and attitudes of the midwives/obstetricians taking part in the trial. Attention must be paid to the way blood loss is measured, such as by haematocrit measurement before and after delivery, and direct measurement of the blood loss.

## NOTES

Summary of previous revisions:

(1) 11 November 2004

The title of this Review has changed from 'Position for women during second stage of labour' to 'Position in the second stage of labour for women without epidural anaesthesia' to differentiate its scope from the newly registered title 'Position in the second stage of labour for women with epidural anaesthesia'.

(2) 12 November 2003

This update incorporates one new trial, Racinet 1999, and excludes several others.

## POTENTIAL CONFLICT OF INTEREST

One of the reviewers (JK Gupta) is an author of one of the articles included in the review.

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\*Indicates the major publication for the study

**T A B L E S****Characteristics of included studies**

Study	Allahbadia 1992
Methods	Randomisation not adequately described. Women were “randomly selected” irrespective of their age, parity, height, weight or baby’s weight.

### Characteristics of included studies (Continued)

Participants	200 women, Bombay, India. 100 study participants: 42 primigravidae, 58 multigravidae. 100 control participants: 46 primigravidae, 54 multigravidae. All women had full term (37 weeks completed) gestation; adequate pelvis; vertex presentation; no medical, surgical or obstetric complications.
Interventions	Study group: 100 women were kept ambulatory during the first stage of labour and were asked to squat on a delivery cot during the second stage of labour. The last 20/42 primigravidae were subjected to prophylactic episiotomies. No support was given to the perineum at the time of delivery. Control group: 100 women were kept in a supine position during the first and second stage of labour. All (46) primigravidae were subjected to prophylactic episiotomies. It is not stated whether support was given to the perineum at the time of delivery. All women were in the supine position for the 3rd stage of labour.
Outcomes	*Duration of first, second and third stage of labour. *Method of delivery. *Complications to mother and infant.
Notes	The randomisation method is unclear. It is not stated whether support was given to the perineum at the time of delivery in the control group.
Allocation concealment	B – Unclear

### Study **Bhardwaj 1994**

Methods	Women in labour were randomly allocated on admission in the labour ward to odd or even numbers, irrespective of their out-patient department number. Randomisation occurred before exclusion criteria were applied. Odd numbers = squatting and even numbers = lithotomy.
Participants	617 women, Latur, India. 294 study participants: 136 primigravidae, 158 multigravidae. 323 control participants: 148 primigravidae, 175 multigravidae. All women had full-term (> 36 weeks completed) gestation; vertex presentation. No medical, surgical or obstetric complications.  Exclusion criteria: high-risk pregnancies; previous caesarian sections; epilepsy; hypertension; jaundice in pregnancy; malaria; heart disease; diabetes; rhesus factor negative; postmaturity (> 40 weeks); other than vertex presentation; antepartum haemorrhage; severe anaemia; cephalopelvic disproportion; premature labour; late registration in labour; those who refused to squat.
Interventions	750 women were randomised before exclusion criteria were applied. These included women who were randomised to squat, but who declined to do so. 617 women took part in the study. 293 women were randomised to squat on a “birth cushion”. Women who spent 90% of the active bearing down phase on the birth cushion were analysed in the squatting group. Episiotomy was not done routinely in the squatting group. The groups were compared by the original (intention to treat) allocation, irrespective of the actual second stage positions. 323 women were not informed about the “birth cushion” and delivered in the lithotomy position. All women were allowed to ambulate during the first stage of labour, although the majority preferred lying down.
Outcomes	Lying down during first stage (no statistical difference). *Duration of second and third stage of labour. *Method of delivery. *Blood loss estimated visually. *Complications to mother.

**Characteristics of included studies (Continued)**

	Complications to the infant. Statistical difference in fetal distress between the two groups (squatting 7/294 and 21/323 in the lithotomy group). Weight of infant (no statistical difference).
Notes	Only abstract publication was available for the review. Postpartum haemorrhage was not defined but assumed to be > 500 ml.
Allocation concealment	C – Inadequate

<b>Study</b>	<b>Chan 1963</b>
Methods	Alternate primigravidae were assigned to one of two groups during the first stage of labour. Women in group A were kept in the erect position during first stage of labour; women in group B were kept in bed in the lateral or dorsal position during first stage of labour. During second stage, women in group A (study group) were propped up to 45-60 degrees in the delivery bed. Women in group B (control) delivered in the dorsal position.
Participants	200 women, Hong Kong. 100 study participants. 100 control participants. Singleton and twin pregnancies were included (one twin pregnancy in the study group), from 32 weeks' gestation.
Interventions	Study group: 100 women were kept ambulatory during the first stage of labour and were propped up to 45-60 degrees in the bed during the second stage of labour. Control group: 100 women were kept in a supine or lateral position during the first of labour and in the dorsal position during the second stage of labour.
Outcomes	There were no statistically significant differences between the two groups regarding, maternal age, gestation or complications during labour. *Use of analgesia/anaesthesia. *Duration of first and second stage of labour. *Method of delivery. *Perinatal deaths. *Manual removal of placenta.
Notes	
Allocation concealment	C – Inadequate

<b>Study</b>	<b>Crowley 1991</b>
Methods	Randomisation by means of numbered sealed opaque envelopes just before second stage of labour.
Participants	1250 women participated, Dublin, Ireland. There were 20 postrandomisation withdrawals. 1230 women's results included. 634 study participants. 596 control participants. Only nulliparae. All women had reached 34 weeks' completed gestation. Singleton pregnancies. Vertex presentation. Induced and augmented women were allowed to participate. No epidural anaesthesia.
Interventions	Study group: 634 women were allocated at the beginning of second stage to deliver in the "E-Z birth chair" (413/634 did deliver in the chair). The height and angle of the chair were adjusted according to the preference of the midwife and the parturient. Control group:



## Characteristics of included studies (Continued)

	596 women were allocated to deliver on the bed (576/596 did deliver on the bed). The women were allowed to use any of the following positions: recumbent, semi-recumbent, dorsal, or left lateral.
Outcomes	<p>There were no statistically significant differences between the groups for meconium stained liquor, duration of first stage, birthweight and gestational age.</p> <p>*Maternal experience and satisfaction of second stage of labour.</p> <p>*Use of analgesia/anaesthesia.</p> <p>*Duration of second stage of labour.</p> <p>*Method of delivery.</p> <p>*Trauma to the birth canal.</p> <p>*Postpartum haemorrhage.</p> <p>*Neonatal condition.</p> <p>Apgar scores (no difference).</p> <p>*Admission to NICU.</p>
Notes	<p>There were 20 post randomisation withdrawals of whom 7 had been allocated to the chair and 13 to the bed, and these women were not included in the analyses. Only 413/634 allocated to the chair, delivered in the chair and 576/596 allocated to the bed delivered in the bed. Analyses were done according to group allocation (intention to treat). The above short comings of the trial could have an effect on the results.</p> <p>A subgroup of women were interviewed (263 chair vs 289 bed).</p>
Allocation concealment	A – Adequate

Study	Gardosi 1989a
Methods	Randomisation was by adding the last digit of the women's hospital number to the date of admission. The groups were then allocated according to odd and even numbers.
Participants	<p>427 primigravidae only, Milton Keynes, England.</p> <p>218 study participants.</p> <p>209 control participants.</p> <p>All women had full-term (37 weeks completed) gestation.</p> <p>Singleton pregnancies.</p> <p>No contraindications for normal vaginal delivery.</p> <p>Vertex presentation.</p> <p>No medical, surgical or obstetric complications.</p> <p>Induced and spontaneous labours were included.</p> <p>No epidural anaesthesia.</p>
Interventions	<p>Study group:</p> <p>218 women were allocated to the study group. Upright second stage positions were defined as squatting using a birth cushion (156/218), which was placed on the bed or floor. It was made of foam plastic, and had a 'u' shape and side handles. It allowed the women to adopt a modified squatting position during delivery. Other upright positions used were kneeling (15/218) and sitting (8/218). Thirty-nine women, who were allocated to deliver in an upright position, used a semi-recumbent or lateral position during second stage.</p> <p>Control group:</p> <p>209 women allocated to deliver in a conventional recumbent position, propped up to about 30 degrees from the horizontal, or on the side. Twenty-two women spontaneously used an upright position, squatting (10/209), kneeling (6/209) or sitting (6/209) for delivery.</p> <p>All women were free to walk about, sit up, or lie in the bed, during the first stage of labour. Episiotomy was not performed routinely.</p>
Outcomes	<p>There were no statistically significant differences between the two groups for maternal age, gestation, birthweight and Apgar scores.</p> <p>*Duration of second stage of labour.</p> <p>*Method of delivery.</p> <p>*Trauma to the birth canal.</p>

## Characteristics of included studies (Continued)

	*Postpartum haemorrhage. Perinatal deaths: none.
Notes	Blood loss was estimated visually.
Allocation concealment	C – Inadequate

<b>Study</b>	<b>Gardosi 1989b</b>
Methods	Randomisation was by adding the last digit of the woman's hospital number to the date of admission. The groups were then allocated according to odd and even numbers.
Participants	151 primigravidae only, Milton Keynes, England. 73 study participants. 78 control participants. All women had full-term (37 weeks completed) gestation. Maternal age between 16-35 years. Singleton pregnancies. No contraindications for normal vaginal delivery. Vertex presentation. No medical, surgical or obstetric complications. Induced and spontaneous labours were included. Had no epidural anaesthesia.
Interventions	Study group: 73 women were allocated to the study group. Upright second stage positions were defined as squatting, kneeling, sitting upright or standing. Control group: 78 women were allocated to deliver in a conventional recumbent position, propped up to about 30 degrees from the horizontal, or on the side. All women were free to walk about, sit up, or lie in the bed, during first stage of labour. Episiotomy was not done routinely.
Outcomes	There were no statistically significant differences between the two groups for: Maternal age, gestation, Apgar scores or birthweight. *Duration of second stage of labour. *Method of delivery. *Trauma to the birth canal. *Postpartum haemorrhage.
Notes	Blood loss was estimated visually.
Allocation concealment	C – Inadequate

<b>Study</b>	<b>Gupta 1989</b>
Methods	Randomisation was by opaque sealed envelopes, determined by a random-number generator. Randomisation took place at 30 weeks' gestation.
Participants	114 women, Leeds, England. 67 study participants. 47 control participants. No further details of participants available.  Women had full-term (37 weeks completed) gestation. Singleton pregnancies. Adequate pelvis. No contraindications for normal vaginal delivery. Vertex presentation.

## Characteristics of included studies (Continued)

	No medical, surgical or obstetric complications.
Interventions	<p>Study group: 67 women were allocated at 30 weeks of gestation to deliver in a squatting position. These women were asked to attend a special parentcraft class, concentrating on special leg exercises. These women were given advice on the advantages of squatting during delivery. Women were encouraged to adopt the squatting position when full cervical dilatation had been reached.</p> <p>Control group: 47 women were randomised to deliver in the conventional way.</p>
Outcomes	<p>*Duration of second stage of labour. *Method of delivery. *Trauma to the birth canal. *Postpartum haemorrhage. No statistically significant differences between the Apgar scores of the two groups.</p>
Notes	<p>Additional data obtained from the author. Data in the published report not in useable format. Women were randomised at 30 weeks and received intensive advice on the benefits of the treatment. Data on duration of the second stage exclude the women who had caesarean sections or assisted deliveries.</p>
Allocation concealment	A – Adequate

### Study **Hemminki 1986**

Methods	Randomisation was by means of sealed envelopes in blocks of ten, stratified for gravidity. Women were randomised during the first stage of labour.
Participants	<p>175 women, Kainuu, Finland. 88 study participants. 87 control participants. All women had reached 35 weeks completed gestation. Singleton pregnancies. No contra-indications for normal vaginal delivery. Vertex presentation. No medical, surgical or obstetric complications.</p>
Interventions	<p>Study group: 88 women were randomised during the first stage of labour to use a birth chair. The mean cervical dilatation when transferred to the chair was 8.8 cm. The chair was made locally and was normally maintained with the back 60-70 degrees from the horizontal. 12 women did not deliver in the chair.</p> <p>Control group: 87 women lay on their backs, propped up less than 45 degrees from the horizontal.</p>
Outcomes	<p>There were no statistically significant differences between the two groups for maternal age, gestation, gravidity, birthweight and Apgar scores. *Method of delivery.</p>
Notes	Data not in a usable format.
Allocation concealment	B – Unclear

### Study **Hillan 1984**

Methods	Randomisation was by drawing a sealed envelope towards the end of the first stage of labour.
Participants	<p>500 women, Glasgow, UK. 250 study participants and 250 control participants. All women had singleton pregnancies, at 37-42 weeks gestation, were of mixed parity (250 primigravidae, 250 multigravidae), with a cephalic presentation, either in induced or spontaneous labour.</p>
Interventions	Study group: 250 women were to be delivered in a 'Birth E-Z' birthing chair. During delivery the chair was maintained with the back 15 to 20 degrees from the vertical. Control group: 250 women were to be delivered

### Characteristics of included studies (Continued)

in a bed in the dorsal recumbent position, but could be propped up to a maximum of 20 degrees from the horizontal. All women could remain ambulant throughout the first stage of labour.

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Outcomes	Duration of first stage of labour and active pushing, mode of delivery, use of analgesia, blood loss, incidence of perineal damage.
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Notes

Allocation concealment B – Unclear

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#### Study **Humphrey 1973**

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Methods	Method of randomisation not stated. Randomisation was carried out at the beginning of second stage.
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Participants	40 women, Melbourne, Australia. 20 study participants. 20 control participants. All women had full-term (36 weeks completed) gestation. No medical, surgical or obstetric complications.
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Interventions	Study group: 20 women were randomised at the beginning of the second stage of labour to deliver in a left lateral tilt position. Lateral tilt of about 15 degrees was obtained by the use of a firm pillow or wedge. Control group: 20 women were delivered in the dorsal position.
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Outcomes	There were no statistically significant differences between the two groups for maternal age, gestation, birth-weight, cord blood pH and Apgar scores. *Duration of second stage of labour.
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Notes

Allocation concealment B – Unclear

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#### Study **Johnstone 1987**

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Methods	Randomisation by sealed envelopes at the onset of second stage of labour. Nulliparous women were randomised separately to include more nulliparous women.
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Participants	58 mainly nulliparous women, Kuwait. Control group: 30 women. Study group: 28 women.
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Interventions	Control group: supine. Study group: 15 degree lateral tilt. Second stage and delivery were left to individual midwife. After delivery, a 2 ml blood sample was aspirated from the umbilical artery to measure acid base status.
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Outcomes	Gestational age: significantly lower in the tilt group. Birthweight. Length of second stage. Mode of delivery. Apgar scores at 1 minute and 5 minutes. Episiotomy. Blood loss. Acid base status from umbilical artery - dorsal group had a significantly lower pH and higher pCO <sub>2</sub> than tilt group. With the exception of gestational age, pH and pCO <sub>2</sub> , there were no significant differences in any other outcome measures.
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Notes	61 women randomised but 1 woman from each group had to be excluded as fetal gas analysis was not available and one had an obviously incorrect blood gas result.
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## Characteristics of included studies (Continued)

Allocation concealment B – Unclear

Study	Liddell 1985
Methods	Randomisation envelopes not opened until second stage of labour diagnosed. Motorised birthing chair used in study.
Participants	56 primigravid women, Auckland, New Zealand. Control group: 21 women. Study group: 27 women. All women had 38-42 week singleton pregnancies. Both induced and spontaneous labours.
Interventions	27 birthing chair; 21 supine.
Outcomes	Epidural: no difference. Significantly less pethidine or no analgesia was used for women on the birthing chair. Duration of first and second stage: no difference. Mode of delivery: no difference. Episiotomies, tears, birthweight, fetal distress in second stage, Apgar scores: no difference, but 2 women had extensive second degree tears in the chair.
Notes	5 women were excluded from analysis because of caesarean section. 3 assigned to use the birthing chair chose not to, and were excluded. 24 out of 27 using birthing chair would use it again in next pregnancy. It gave support to back and relief from back pain.

Allocation concealment B – Unclear

Study	Marttila 1983
Methods	Randomisation method unclear. Randomisation at full dilatation.
Participants	100 women, 60 primiparous and 40 multiparous, Helsinki, Finland. 97 spontaneous labours. 3 augmented labours. 38-42 weeks' gestation. Singleton pregnancies.
Interventions	50 supine position on bed (control). 50 'half-sitting' (50 degrees) in chair constructed from delivery beds. First stage: supine in all except 8 ambulating women at 4-6 cm dilatation. Episiotomy in all except 2 multiparous women. No analgesia.
Outcomes	Age, parity, gestational age, length of first stage, birth weight: no difference. Mode of delivery: all delivered vaginally. Vacuum extraction rate was significantly higher in the supine position. No difference in duration of second stage. Late decelerations were more common in the supine position.
Notes	86% of women delivering in the supine position would choose this method again and 96% of those in the half-sitting position.

Allocation concealment B – Unclear

Study	Racinet 1999
Methods	Randomised method described as Zelen, envelopes, stratified for parity.
Participants	239 women, France.

### Characteristics of included studies (Continued)

	120 in the squat (study) position and 119 in the lithotomy control group. Women at full cervical dilation able to assume squatting position of mixed parity. 120 study participants, gestation not stated in paper.
Interventions	Squatting versus lithotomy position for second stage bearing down.
Outcomes	Duration of second stage, cord arterial pH, Apgar scores, method of delivery, perineal trauma, blood loss and women's perspectives.
Notes	
Allocation concealment	C – Inadequate

<b>Study</b>	<b>Radkey 1991</b>
Methods	Randomisation method not clear, described as Zelen. Randomisation at time of admission, with consent of patient after randomisation.
Participants	197 primiparous women, gestation not stated in paper. Halifax, Nova Scotia.
Interventions	Control group: managed 'normally' - position of inclination less than 45 degrees. Study group: upright/squatting.
Outcomes	Duration of second stage. Pushing time for second stage. Mode of delivery.
Notes	Numbers in different groups do not match. Unsure as to the reasons for the disparity making analysis difficult.
Allocation concealment	C – Inadequate

<b>Study</b>	<b>Stewart 1989</b>
Methods	Randomisation took place as late as possible in the first stage of labour. Randomisation was performed by opening sealed envelopes, and women were allocated to deliver in a newly-designed birth chair or in an "wedged" dorsal position.
Participants	304 women, Sheffield, England. 157 study participants: 61 primigravidae, 96 multigravidae. 147 control participants: 56 primigravidae, 91 multigravidae. All women had full-term (37 weeks completed) gestation. Singleton pregnancies. No contra-indications for normal vaginal delivery. Vertex presentation. No women who were augmented or who had epidural analgesia were included.
Interventions	All women were allowed to be ambulant during first stage of labour. Study group: 157 women were randomised to deliver in a special birth chair, kept at a recline of 15-20 degrees from the upright. 22 women did not deliver in the chair but were analysed in the group. Control group: 147 women were randomised to deliver in a 'wedged' dorsal position.
Outcomes	A subsample of 92 women reported on comfort during delivery. More women in the chair group reported that they were comfortable all of the time (23/52 control vs 5/40 study) and 51/52 control and 35/40 study would prefer to use the chair for their next delivery. *Use of analgesia/anaesthesia. *Duration of first, second and third stage of labour. *Method of delivery. *Trauma to the birth canal. *Postpartum haemorrhage. Birthweight: no statistically significant differences.

### Characteristics of included studies (Continued)

	Neonatal condition. Apgar scores < 7 at 1 minute. No statistically significant difference. Cord blood gas: no statistically significant difference.
Notes	Method of blood loss not described.
Allocation concealment	B – Unclear
<b>Study</b>	<b>Suwanakam 1988</b>
Methods	Women were alternately divided into two groups as they came to the delivery suite in spontaneous labour.
Participants	60 women, Sawan province, Thailand. 30 study participants and 30 control participants. All women were 'low risk' without any serious medical complication; primigravida; between 17-35 years whose heights were over 150 centimeters; their gestational ages were between 37-42 weeks. Throughout the first and second stage of labour, no IV fluid or any medications including oxytocin or analgesia.
Interventions	Study group (sitting position): 30 women at the start of the second stage of labour were asked to sit on a specially designed delivery table with the head part raised 45 degrees from the horizontal. Control group: 30 women were in the supine dorsal position.
Outcomes	Characteristics of uterine contraction, duration of second stage of labour, type of delivery, Apgar scores.
Notes	
Allocation concealment	C – Inadequate
<b>Study</b>	<b>Turner 1986</b>
Methods	Women were randomly allocated by the opening of a sealed envelope before the onset of second stage of labour.
Participants	636 women were randomised. 97 were excluded from analyses. London, England. 226 study participants: 111 primigravidae, 115 multigravidae. 313 control subjects: 140 primigravidae, 173 multigravidae. All women had full-term (37 weeks completed) gestation. Singleton pregnancies. Induced and spontaneous labours were included. Women who had epidural anaesthesia were included.
Interventions	Study group: 318 women were randomly allocated to deliver in a 'Birth E-Z' chair. The delivery was conducted with the chair tilted back to an angle of 40 degrees. 92 women in the study group were excluded from the analyses as they did not deliver in the chair. Control group: 318 women were randomly allocated to deliver on the bed in the dorsal position, but were allowed to be propped up with a pillow. 5 women were excluded from the analyses as they insisted on delivering in the chair.
Outcomes	*Duration of second stage of labour. *Method of delivery. *Trauma to the birth canal. *Postpartum haemorrhage. No perinatal deaths were recorded.
Notes	Unfortunately the authors excluded 92 women who were randomly allocated to use the chair, but delivered in the bed, from the analyses. Five women were excluded from the control group who insisted on using the chair for delivery. These exclusions could have affected the results and the data must be interpreted with care. 'Perineal tears' were included in review as second degree tears. It is not clear in the article if these include first degree tears.

## Characteristics of included studies (Continued)

Allocation concealment B – Unclear

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<b>Study</b>	<b>Waldenstrom 1991</b>
Methods	At the end of first stage of labour, the midwife would open a sealed envelope containing one of two instructions: study group = encourage birth sitting on the birthing stool or control group = encourage birth in a conventional semirecumbent position. The women were unaware that they were taking part in a trial, and were only told about the trial two hours after birth.
Participants	294 women, Uppsala, Sweden. 148 study participants. 146 control participants. Singleton and twin pregnancies were included of mixed parity; gestation not stated in paper. No contra-indications to normal vaginal delivery. Vertex and breech presentations were included. Fetal distress was an exclusion criterion.
Interventions	Study group: 148 women were encouraged to give birth on a Dutch-designed birthing stool. The stool was moulded plastic in the shape of a horseshoe and was 32 cm high. The women sat upright in a squatting position with their feet on the ground. 73/148 used the stool to give birth. Control group: 146 women were encouraged to give birth in a conventional semirecumbent position. 100/146 used the conventional position. Data were analysed according to group allocation. Other positions used to give birth were all fours, lateral recumbent and standing.
Outcomes	Pain: women in the study group reported less pain on a 10 point scale (6.9 study vs 7.6 control) and a similar proportion of women in both groups experienced the birth position as not good (3% study vs 2% control). *Duration of second stage of labour. *Method of delivery. *Trauma to the birth canal. *Postpartum haemorrhage. Apgar scores (no statistically significant differences). *Admission to NICU. More midwives reported the study working position as rather awkward (12.8% study vs 3% control). Fathers in the study group felt more supportive, involved and satisfied with their own contribution towards the second stage of labour than those in the control group.
Notes	Group allocations were not adhered to, which could have influenced the outcomes, although analyses were done according to intention to treat.
Allocation concealment	B – Unclear

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<b>Study</b>	<b>de Jong 1997</b>
Methods	Randomisation was carried out in late first stage of labour by means of opaque sealed envelopes.
Participants	517 women, Cape Town, South Africa. 257 study participants: 107 primigravidae, 150 multigravidae. 260 control participants: 115 primigravidae, 145 multigravidae. All women had full-term (37 weeks completed) gestation. Singleton pregnancies. No contraindications for normal vaginal delivery. Vertex presentation. No medical, surgical or obstetric complications. No epidural anaesthesia.

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Interventions	<p>Study group: 257 women were allocated to deliver in the upright position. 249/257 did maintain the position during second stage. The women used a 'step stool' covered with a foam mattress to deliver in a squatting position. They were kept in this position for the 3rd stage of labour.</p> <p>Control group: 260 women delivered in a supine position on a delivery bed. All women were encouraged to walk, sit or recline during the first stage of labour.</p>
Outcomes	<p>There were no statistically significant differences between the two groups for maternal age, gravity, gestation, birthweight or Apgar scores.</p> <p>*Maternal experience and satisfaction of second stage of labour. *Pain. *Use of analgesia. *Duration of second stage of labour. *Method of delivery. *Trauma to the birth canal. *Postpartum haemorrhage. *Abnormal fetal heart rate patterns.</p>
Notes	Correction on state of perineum and vulva data was incorporated in this review (de Jong 1999).
Allocation concealment	A – Adequate
*: outcomes used in the review according to protocol specifications.	
NICU: neonatal intensive care unit	
IV: intravenous	
vs: versus	

### Characteristics of excluded studies

Study	Reason for exclusion
Ahmed 1985	Excluded because insufficient data presented in abstract.
Bonoan 1997	Excluded because insufficient data presented in abstract.
Caldeyro-Barcia	Tried to contact trialists for details of their work.
Chen 1987	Excluded because of multiple (37%) exclusions from the analysis.
Downe 2004	Excluded because all women received an epidural.
Golara 2002	Studied effect of ambulation versus recumbency in only the passive phase of the second stage of labour, not during bearing down.
Golay 1993	Cohort study.
Hegab 2002	Insufficient data given in abstract.
Karraz 2003	Excluded because all women received an epidural.
Liu 1986	<p>The data in this publication are not in a useable format.</p> <p>The authors conclude that the upright posture is advantageous in reducing the duration of second stage of labour.</p>
SchneiderAffeld 1982	<p>Randomisation not stated.</p> <p>Number of primigravida and multigravidae not given.</p> <p>Means only, no standard deviations.</p> <p>Data not presented in an acceptable format.</p> <p>Conclusions from authors: No difference in first or second stage of labour duration. Increase cervical dilatation in the study group.</p>

## Characteristics of excluded studies (Continued)

No differences in fetal outcome.

### ANALYSES

#### Comparison 01. Any upright or lateral position versus supine position/lithotomy

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Any analgesia/anaesthesia during second stage of labour	7	3593	Relative Risk (Fixed) 95% CI	0.97 [0.92, 1.02]
02 Uterine contraction frequency (seconds)	1	60	Weighted Mean Difference (Fixed) 95% CI	4.16 [-8.43, 16.75]
08 Duration of second stage of labour (minutes): primigravidae	8	2817	Weighted Mean Difference (Fixed) 95% CI	-3.35 [-5.08, -1.62]
09 Duration of second stage of labour (minutes): multigravidae	3	1020	Weighted Mean Difference (Random) 95% CI	-4.16 [-11.55, 3.23]
10 Duration of second stage of labour (minutes): all women	9	3163	Weighted Mean Difference (Fixed) 95% CI	-4.28 [-5.63, -2.93]
11 Mode of delivery			Relative Risk (Fixed) 95% CI	Subtotals only
12 Second degree perineal tears	11	5310	Relative Risk (Fixed) 95% CI	1.23 [1.09, 1.39]
13 Episiotomy	12	4899	Relative Risk (Random) 95% CI	0.83 [0.75, 0.92]
14 Third/fourth degree tears	4	1478	Relative Risk (Fixed) 95% CI	0.91 [0.31, 2.68]
15 Blood loss > 500 ml	11	5358	Relative Risk (Fixed) 95% CI	1.63 [1.29, 2.05]
16 Need for blood transfusion	2	1747	Relative Risk (Fixed) 95% CI	1.66 [0.70, 3.94]
17 Manual removal of placenta	3	1710	Relative Risk (Fixed) 95% CI	1.71 [0.86, 3.39]
18 Unpleasant birth experience	1	552	Relative Risk (Fixed) 95% CI	0.89 [0.63, 1.26]
20 Dissatisfied with second stage of labour	1	517	Relative Risk (Fixed) 95% CI	1.01 [0.39, 2.65]
21 Felt out of control	1	552	Relative Risk (Fixed) 95% CI	1.00 [0.77, 1.31]
22 Experienced severe pain at birth	1	517	Relative Risk (Fixed) 95% CI	0.73 [0.60, 0.90]
28 Abnormal fetal heart rate patterns	1	517	Relative Risk (Fixed) 95% CI	0.28 [0.08, 0.98]
31 Admission to neonatal intensive care unit	2	1524	Relative Risk (Fixed) 95% CI	0.81 [0.51, 1.31]
32 Birth injuries	1	200	Relative Risk (Fixed) 95% CI	1.50 [0.26, 8.79]
33 Perinatal death	3	828	Relative Risk (Fixed) 95% CI	0.75 [0.17, 3.29]

#### Comparison 02. Birth stool/squat stool versus supine position

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Any analgesia/anaesthesia during second stage of labour	2	811	Relative Risk (Fixed) 95% CI	0.90 [0.76, 1.06]
11 Mode of delivery			Relative Risk (Fixed) 95% CI	Subtotals only
12 Second degree perineal tears	2	710	Relative Risk (Fixed) 95% CI	3.26 [1.60, 6.64]
13 Episiotomy	2	810	Relative Risk (Fixed) 95% CI	0.70 [0.53, 0.94]
14 Third/fourth degree tears	2	710	Relative Risk (Fixed) 95% CI	1.43 [0.29, 7.17]
15 Blood loss > 500 ml	2	811	Relative Risk (Fixed) 95% CI	2.43 [1.24, 4.79]
16 Need for blood transfusion	1	517	Relative Risk (Fixed) 95% CI	2.02 [0.18, 22.18]
17 Manual removal of placenta	1	293	Relative Risk (Fixed) 95% CI	3.92 [0.44, 34.64]

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20 Dissatisfied with second stage of labour	1	517	Relative Risk (Fixed) 95% CI	1.01 [0.39, 2.65]
22 Experienced severe pain at birth	1	517	Relative Risk (Fixed) 95% CI	0.73 [0.60, 0.90]
28 Abnormal fetal heart rate patterns	1	517	Relative Risk (Fixed) 95% CI	0.28 [0.08, 0.98]
31 Admission to neonatal intensive care unit	1	295	Relative Risk (Fixed) 95% CI	0.86 [0.32, 2.30]
32 Birth injuries	1	200	Relative Risk (Fixed) 95% CI	1.50 [0.26, 8.79]
33 Perinatal death	1	200	Relative Risk (Fixed) 95% CI	1.00 [0.14, 6.96]

### Comparison 03. Lateral versus supine position

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
10 Duration of second stage of labour (minutes): all women	2	97	Weighted Mean Difference (Fixed) 95% CI	-4.34 [-11.07, 2.39]
11 Mode of delivery			Relative Risk (Fixed) 95% CI	Subtotals only
13 Episiotomy	1	58	Relative Risk (Fixed) 95% CI	1.03 [0.83, 1.28]

### Comparison 04. Birth cushion versus supine/lithotomy

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
08 Duration of second stage of labour (minutes): primigravidae	2	711	Weighted Mean Difference (Fixed) 95% CI	-13.22 [-16.73, -9.72]
09 Duration of second stage of labour (minutes): multigravidae	1	333	Weighted Mean Difference (Fixed) 95% CI	-10.58 [-14.89, -6.27]
10 Duration of second stage of labour (minutes): all women	2	1042	Weighted Mean Difference (Random) 95% CI	-15.24 [-22.93, -7.55]
11 Mode of delivery			Relative Risk (Fixed) 95% CI	Subtotals only
12 Second degree perineal tears	2	1042	Relative Risk (Fixed) 95% CI	0.72 [0.54, 0.97]
13 Episiotomy	1	425	Relative Risk (Fixed) 95% CI	0.99 [0.71, 1.36]
14 Third/fourth degree tears	1	617	Relative Risk (Fixed) 95% CI	1.10 [0.16, 7.75]
15 Blood loss > 500 ml	2	1044	Relative Risk (Fixed) 95% CI	1.00 [0.54, 1.88]

### Comparison 05. Birth chair versus supine/lithotomy

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Any analgesia/anaesthesia during second stage of labour	3	2534	Relative Risk (Fixed) 95% CI	0.97 [0.93, 1.03]
08 Duration of second stage of labour (minutes): primigravidae	3	1847	Weighted Mean Difference (Fixed) 95% CI	0.82 [-1.25, 2.88]
09 Duration of second stage of labour (minutes): multigravidae	2	687	Weighted Mean Difference (Random) 95% CI	-0.88 [-6.65, 4.89]
10 Duration of second stage of labour (minutes): all women	3	1485	Weighted Mean Difference (Fixed) 95% CI	0.22 [-1.83, 2.26]
11 Mode of delivery			Relative Risk (Random) 95% CI	Subtotals only
12 Second degree perineal tears	4	3063	Relative Risk (Fixed) 95% CI	1.36 [1.17, 1.57]
13 Episiotomy	4	2580	Relative Risk (Random) 95% CI	0.80 [0.63, 1.01]

15 Blood loss > 500 ml	4	2999	Relative Risk (Fixed) 95% CI	1.90 [1.37, 2.62]
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### Comparison 06. Sensitivity analysis based on trial quality

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Any analgesia/anaesthesia during second stage of labour	6	3393	Relative Risk (Fixed) 95% CI	0.96 [0.91, 1.01]
02 Duration of second stage of labour (minutes): primigravidae	4	1895	Weighted Mean Difference (Fixed) 95% CI	0.73 [-1.32, 2.79]
03 Duration of second stage of labour (minutes): multigravidae	2	687	Weighted Mean Difference (Fixed) 95% CI	-0.39 [-3.27, 2.48]
04 Duration of second stage of labour (minutes): all women	5	1731	Weighted Mean Difference (Fixed) 95% CI	0.49 [-1.42, 2.41]
05 Mode of delivery			Relative Risk (Fixed) 95% CI	Subtotals only
06 Second degree perineal tears	7	3882	Relative Risk (Fixed) 95% CI	1.41 [1.22, 1.63]
07 Episiotomy	9	4088	Relative Risk (Fixed) 95% CI	0.81 [0.75, 0.87]
08 Third/fourth degree tears	2	710	Relative Risk (Fixed) 95% CI	1.43 [0.29, 7.17]
09 Blood loss > 500 ml	7	3924	Relative Risk (Fixed) 95% CI	1.96 [1.47, 2.62]
10 Manual removal of placenta	2	1522	Relative Risk (Fixed) 95% CI	1.89 [0.92, 3.86]
11 Perinatal death	1	200	Relative Risk (Fixed) 95% CI	1.00 [0.14, 6.96]

### INDEX TERMS

#### Medical Subject Headings (MeSH)

Delivery, Obstetric [\*methods]; \*Labor Stage, Second; \*Posture; Randomized Controlled Trials

#### MeSH check words

Female; Humans; Pregnancy

### COVER SHEET

<b>Title</b>	Position in the second stage of labour for women without epidural anaesthesia
<b>Authors</b>	Gupta JK, Hofmeyr GJ, Smyth R
<b>Contribution of author(s)</b>	JK Gupta was responsible, with Cheryl Nikodem, for the original review. GJ Hofmeyr updated the review in April 2003. R Smyth updated the review in 2005 with input from JK Gupta and GJ Hofmeyr.
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<b>Review first published</b>	2000/1
<b>Date of most recent amendment</b>	21 February 2006
<b>Date of most recent SUBSTANTIVE amendment</b>	25 April 2003
<b>What's New</b>	12 December 2005 New search conducted in September 2005 identified two new studies (Downe 2004; Karraz 2003), which were subsequently excluded. Suwanakam 1988, which was excluded in the previous version, has now been included. Bomfin-Hyppolito 1998, which was previously excluded as large numbers of women were excluded from the analysis, is now in 'Studies

awaiting assessment'. The trial author has been contacted and has confirmed she will send the required data. These data will be analysed in the next update. Data from the trial by Stewart 1983 has been superseded by Hillan 1984. The methods section has been updated and sensitivity analysis performed based on excluding trials with clearly inadequate allocation concealment (rated C).

The conclusions have not changed.

**Date new studies sought but none found**

Information not supplied by author

**Date new studies found but not yet included/excluded**

Information not supplied by author

**Date new studies found and included/excluded**

30 September 2005

**Date authors' conclusions section amended**

Information not supplied by author

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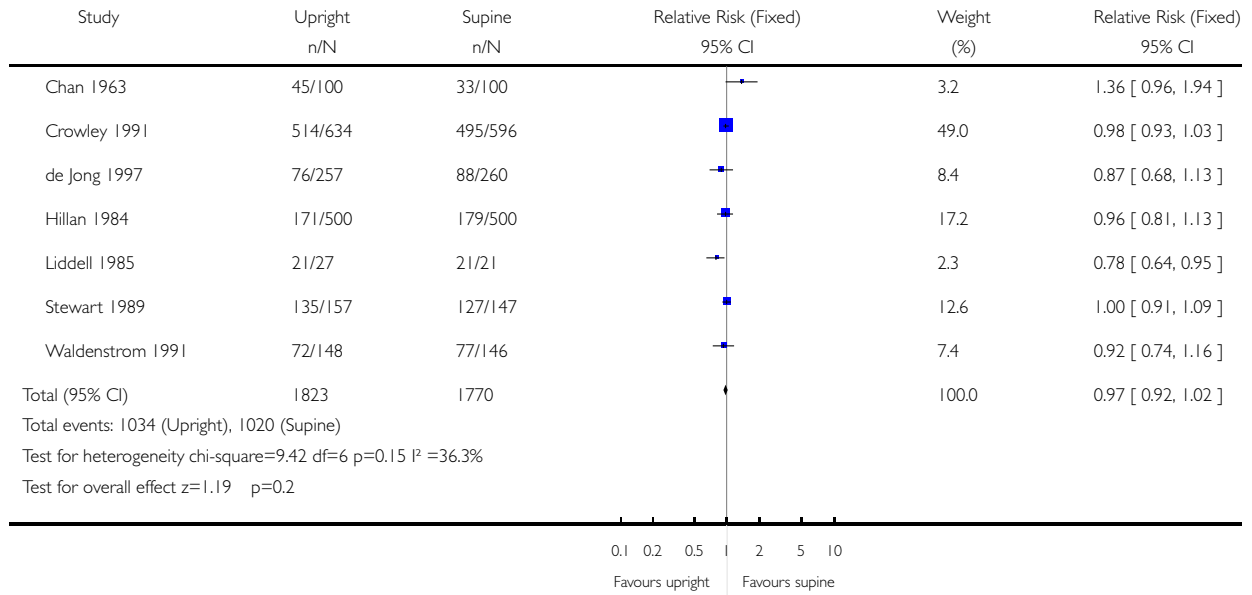
GRAPHS AND OTHER TABLES

**Analysis 01.01. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 01 Any analgesia/anaesthesia during second stage of labour**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 01 Any analgesia/anaesthesia during second stage of labour

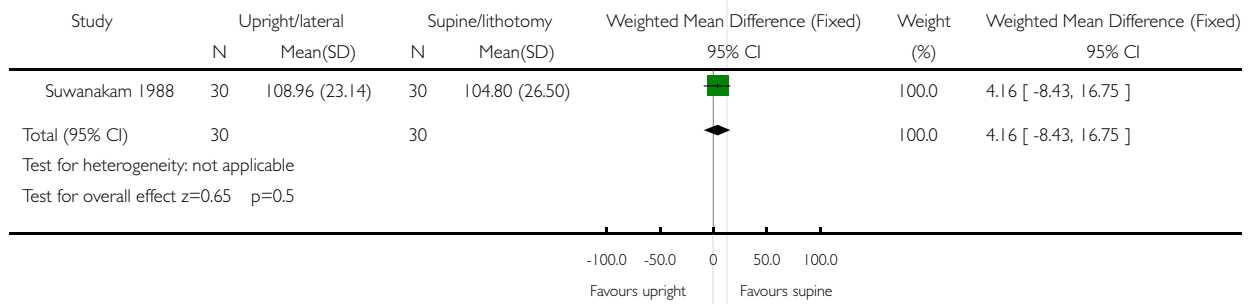


**Analysis 01.02. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 02 Uterine contraction frequency (seconds)**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 02 Uterine contraction frequency (seconds)

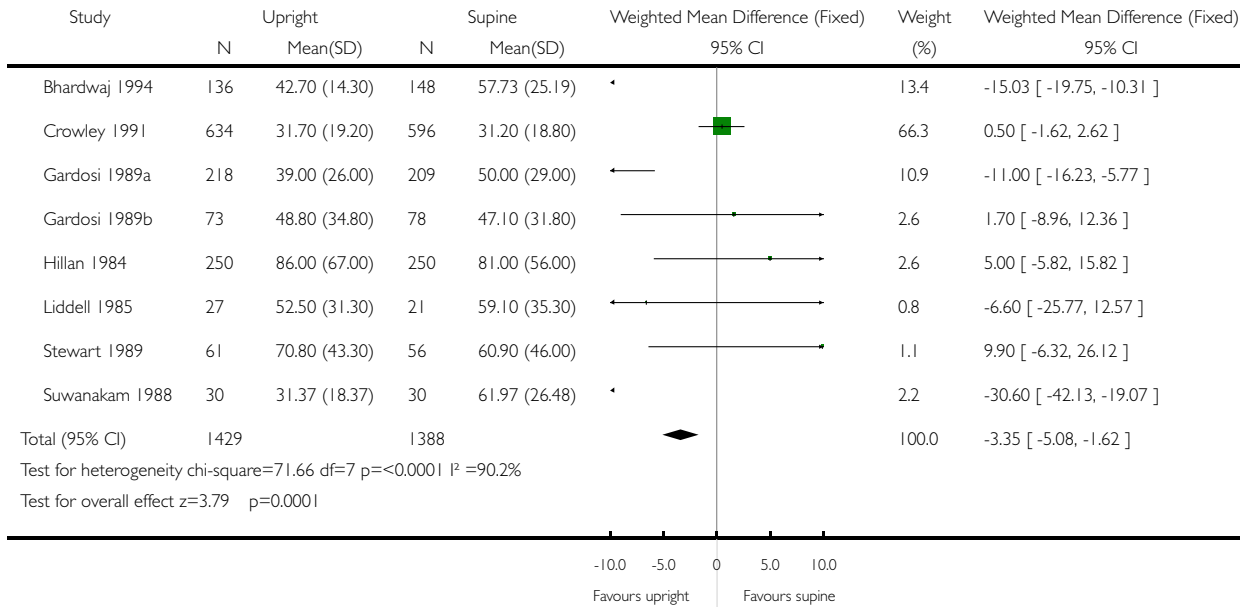


**Analysis 01.08. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 08 Duration of second stage of labour (minutes): primigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 08 Duration of second stage of labour (minutes): primigravidae

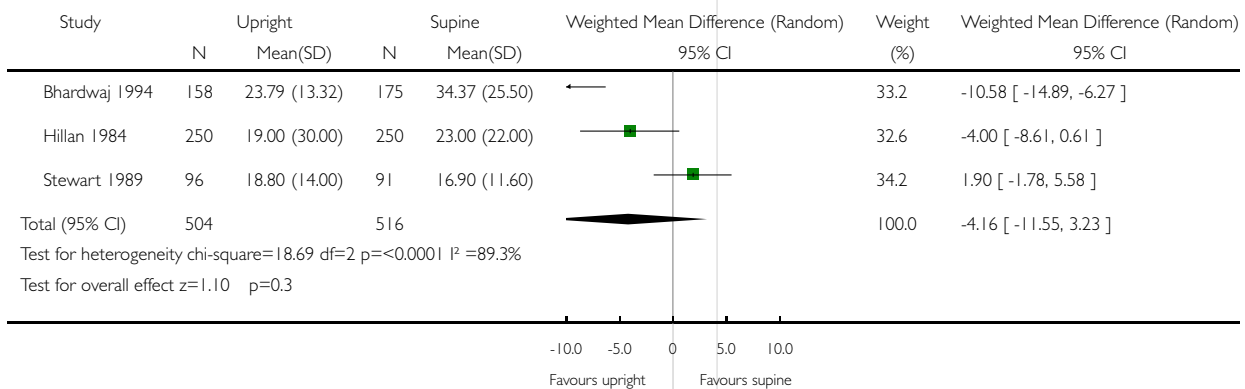


**Analysis 01.09. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 09 Duration of second stage of labour (minutes): multigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 09 Duration of second stage of labour (minutes): multigravidae

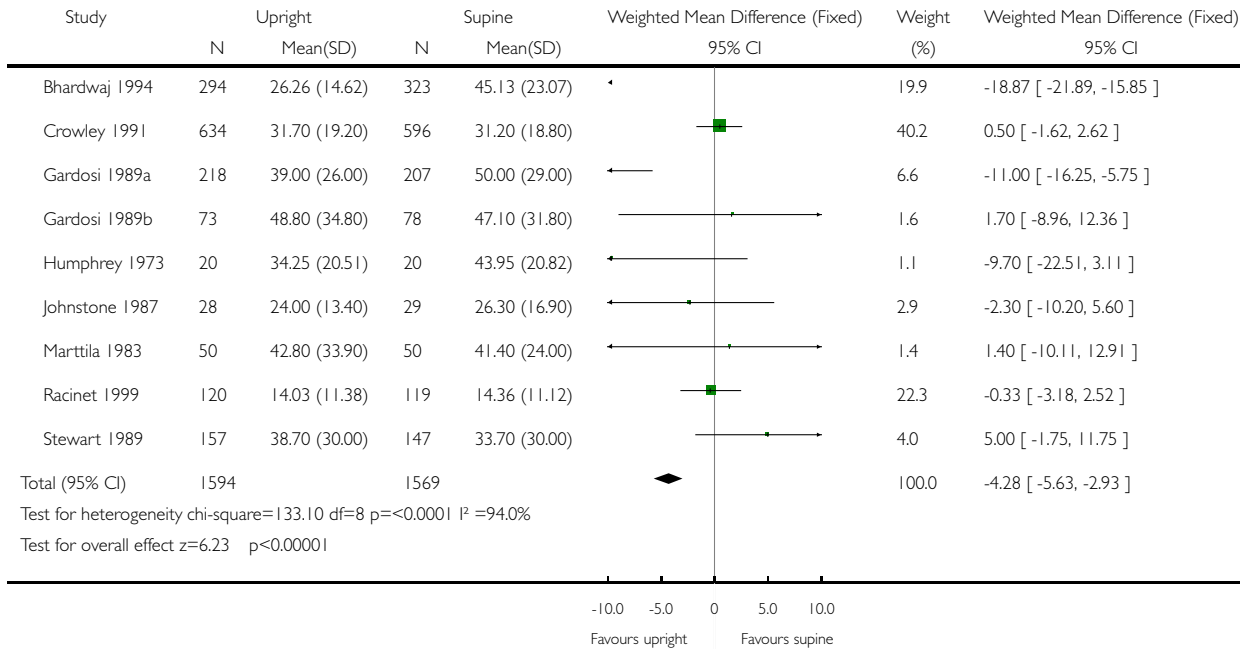


**Analysis 01.10. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 10 Duration of second stage of labour (minutes): all women**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 10 Duration of second stage of labour (minutes): all women



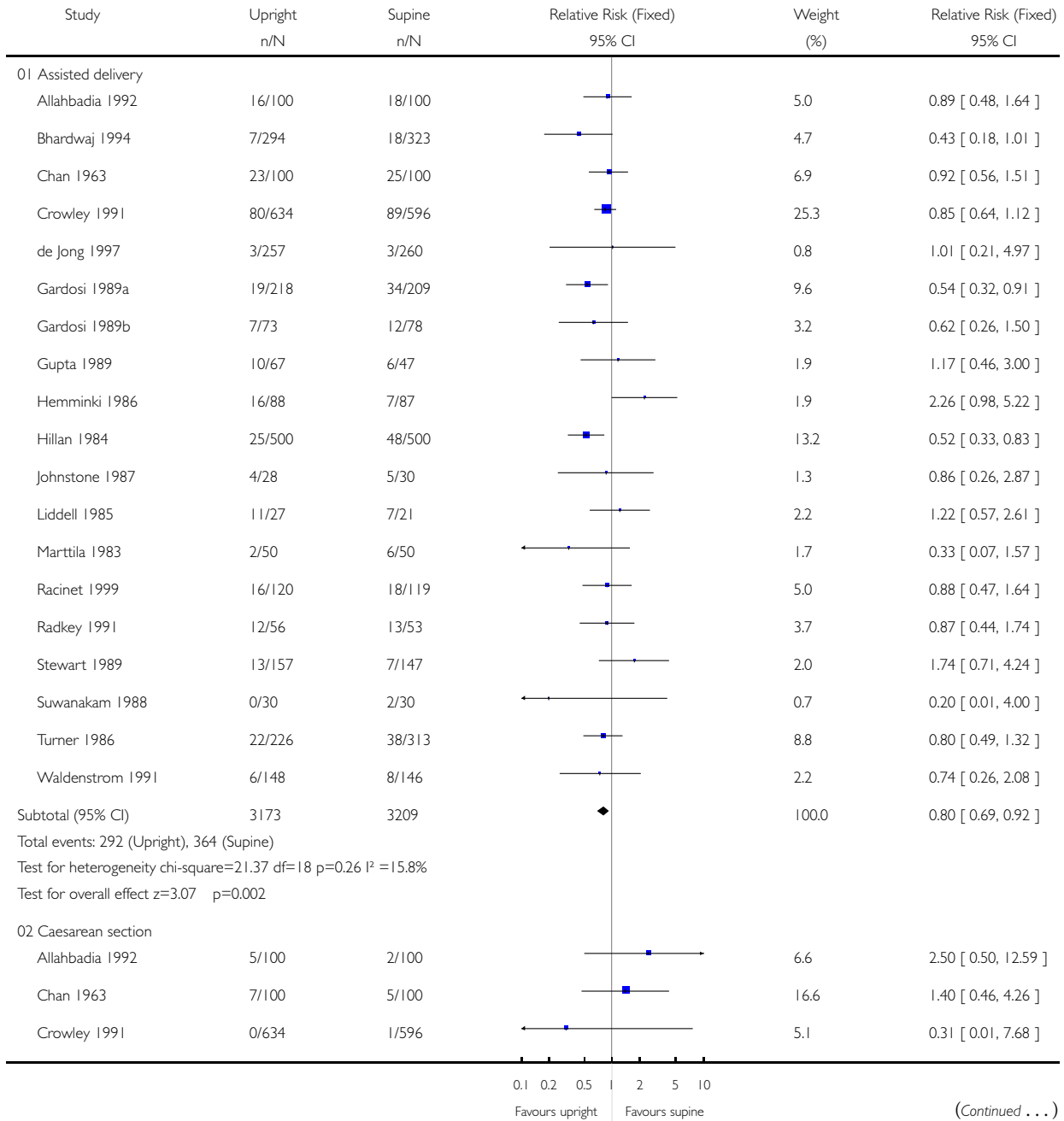


**Analysis 01.11. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 11 Mode of delivery**

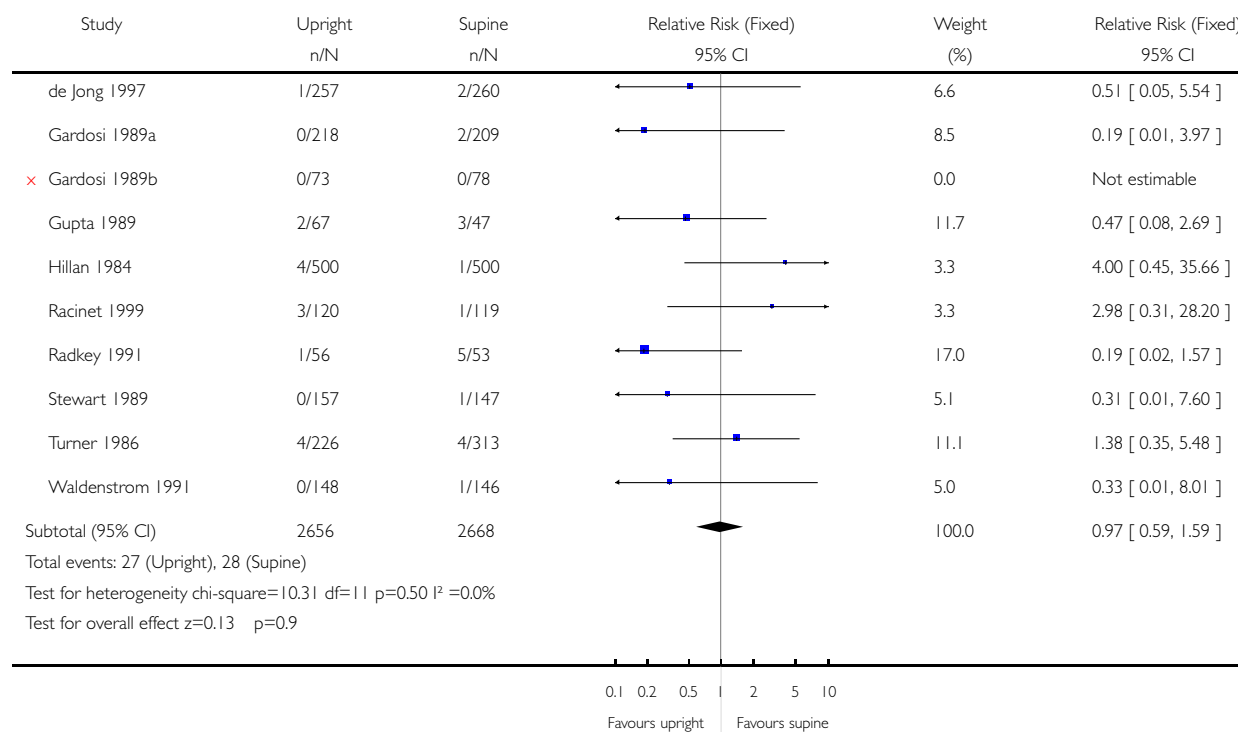
Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 11 Mode of delivery



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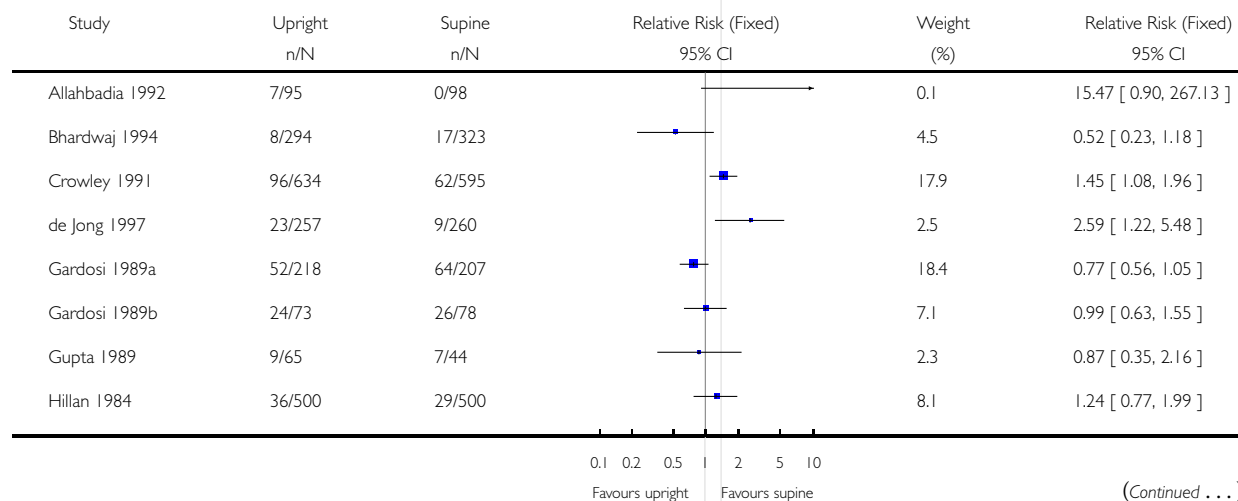


### Analysis 01.12. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 12 Second degree perineal tears

Review: Position in the second stage of labour for women without epidural anaesthesia

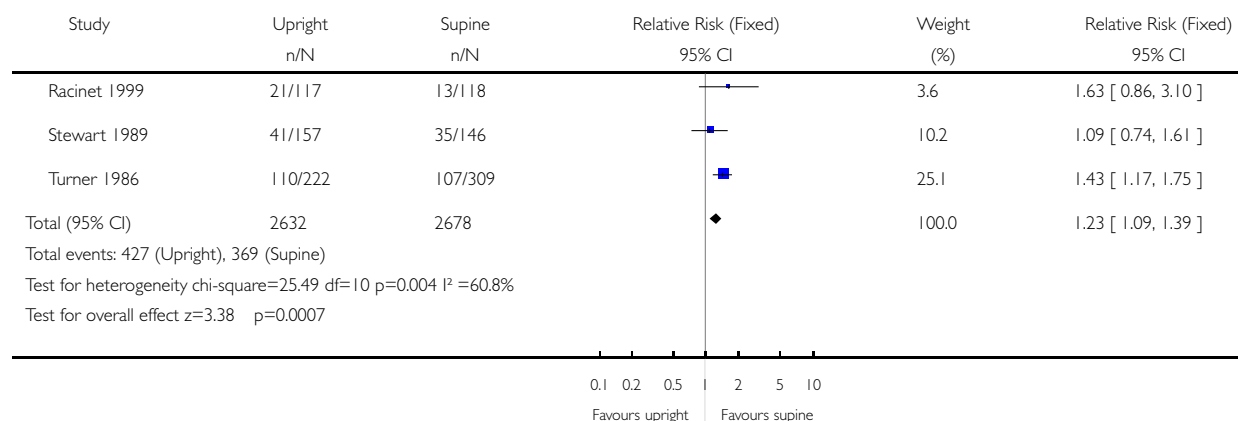
Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 12 Second degree perineal tears



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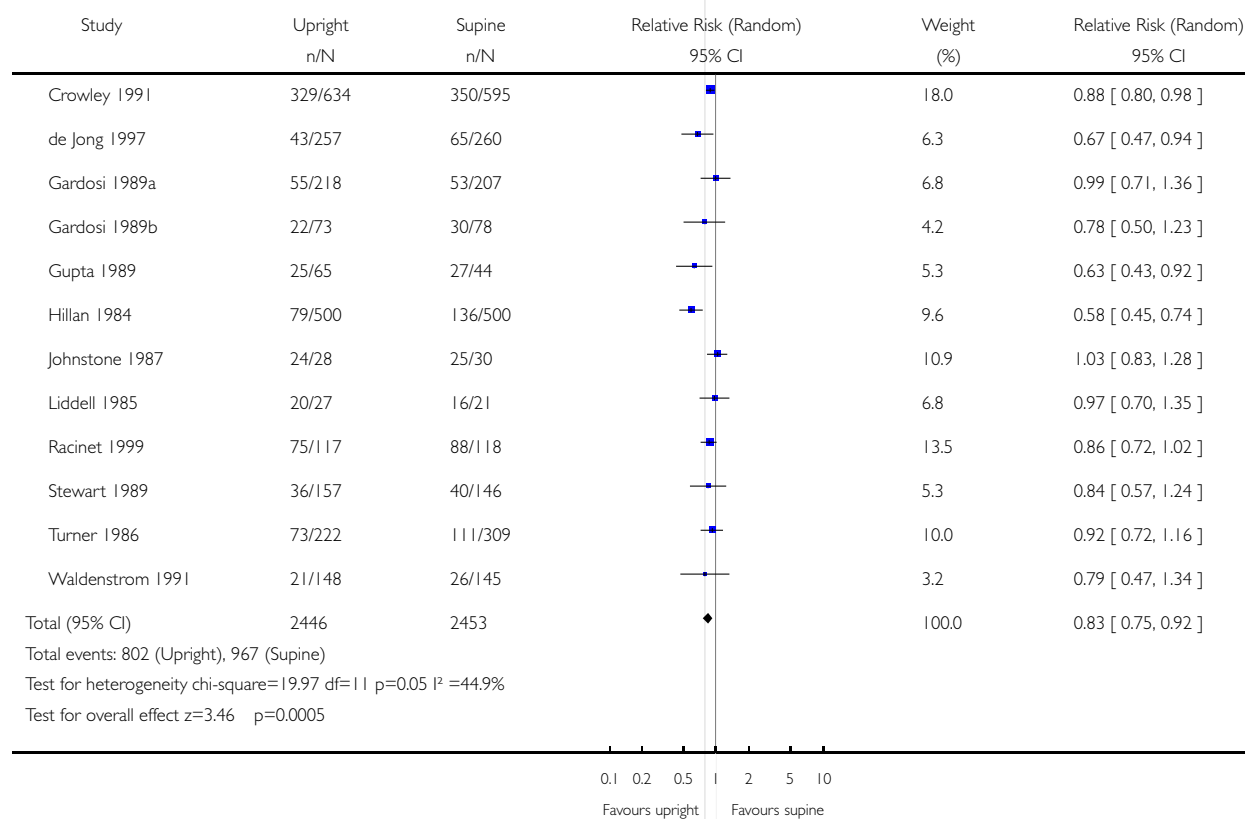


### Analysis 01.13. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 13 Episiotomy

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 13 Episiotomy

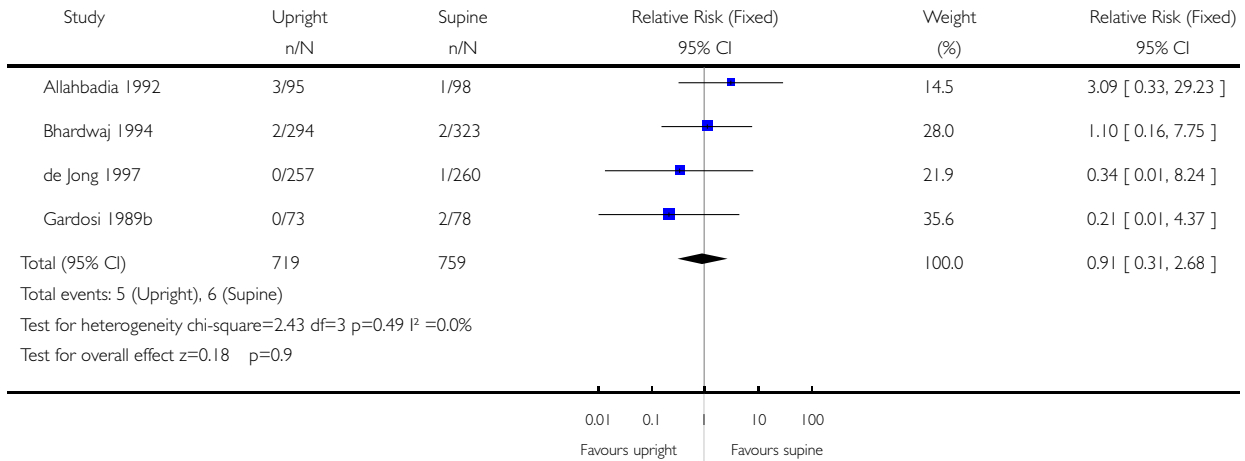


**Analysis 01.14. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 14 Third/fourth degree tears**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 14 Third/fourth degree tears

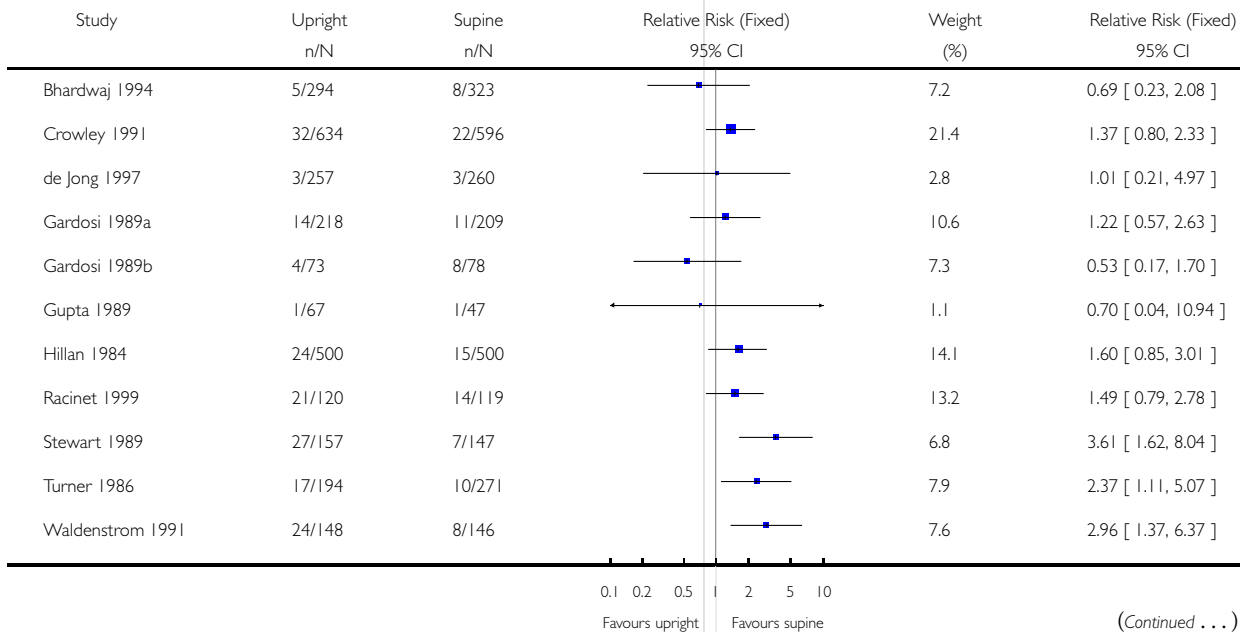


**Analysis 01.15. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 15 Blood loss > 500 ml**

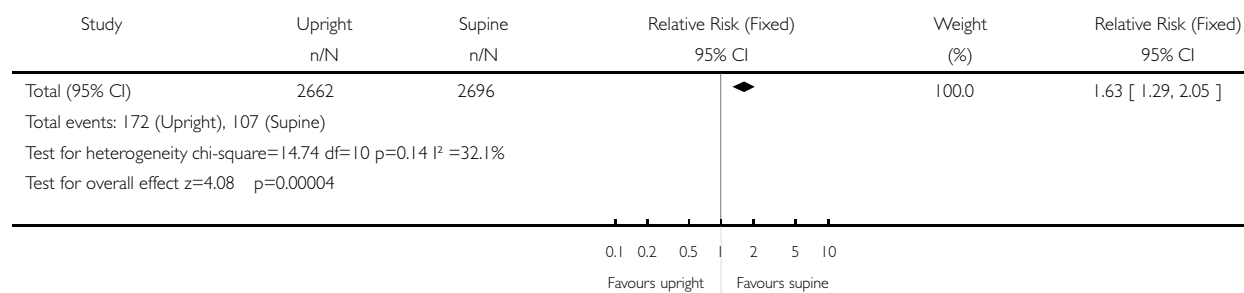
Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 15 Blood loss > 500 ml



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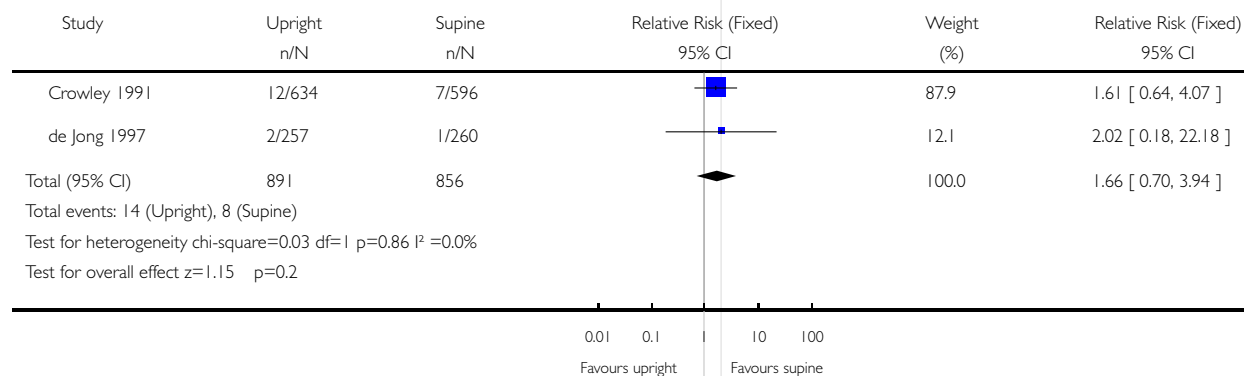


### Analysis 01.16. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 16 Need for blood transfusion

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 16 Need for blood transfusion

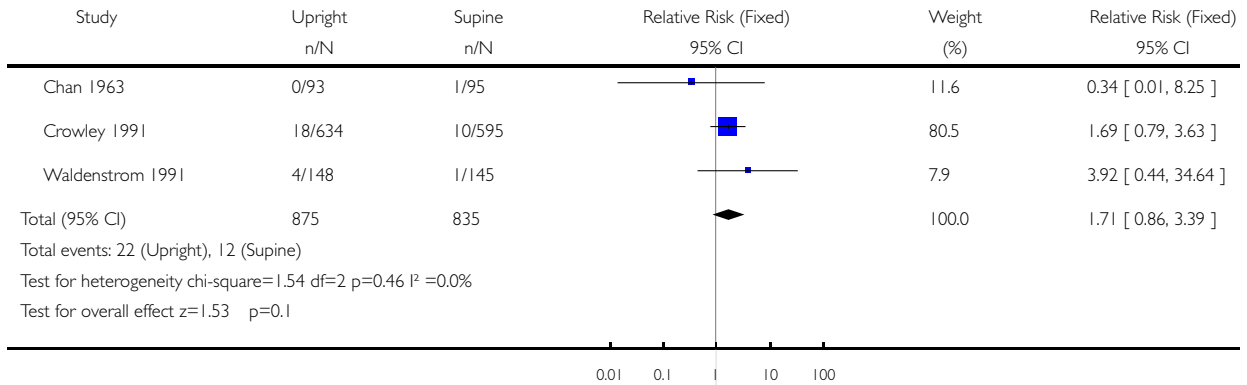


**Analysis 01.17. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 17 Manual removal of placenta**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 17 Manual removal of placenta

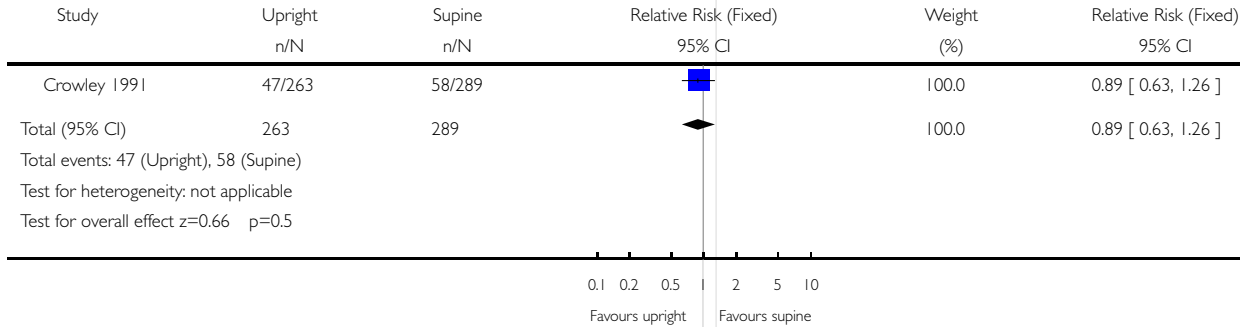


**Analysis 01.18. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 18 Unpleasant birth experience**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 18 Unpleasant birth experience

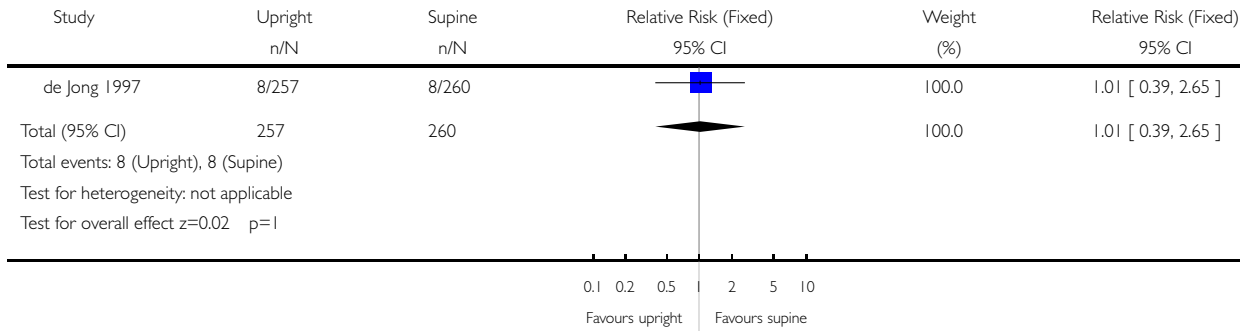


**Analysis 01.20. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 20 Dissatisfied with second stage of labour**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 20 Dissatisfied with second stage of labour

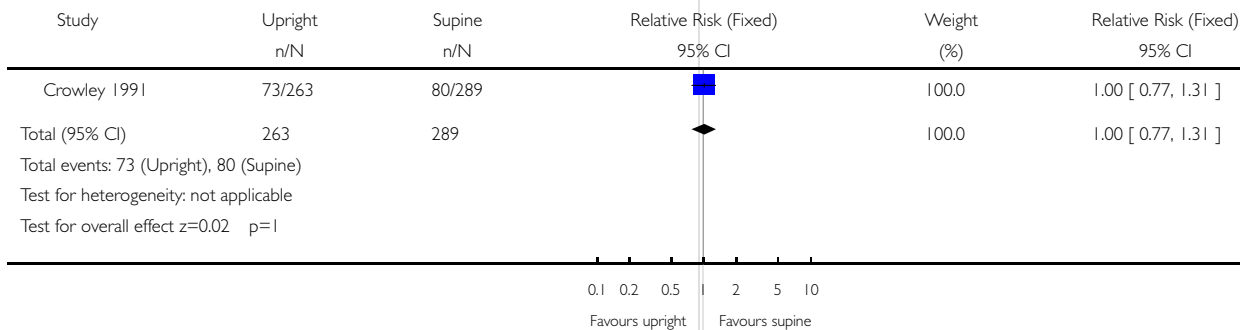


**Analysis 01.21. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 21 Felt out of control**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 21 Felt out of control

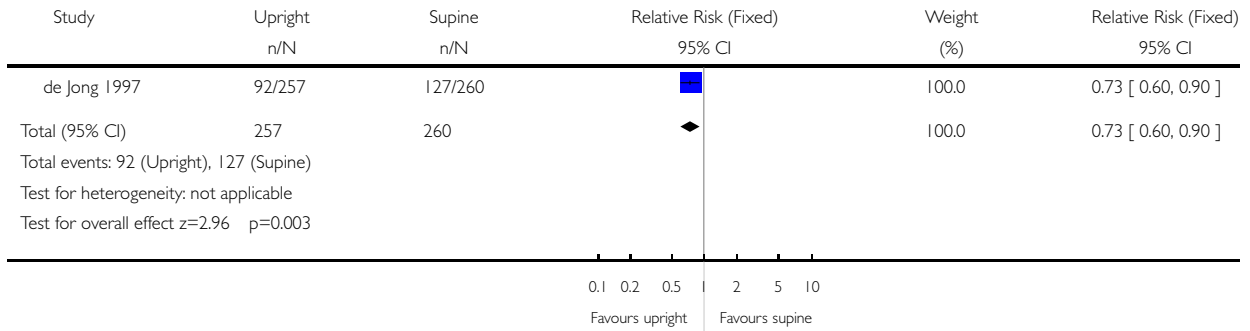


**Analysis 01.22. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 22 Experienced severe pain at birth**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 22 Experienced severe pain at birth

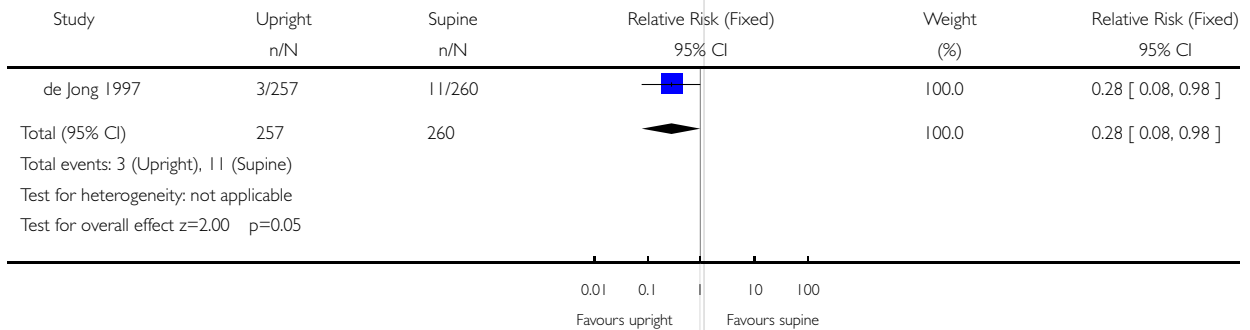


**Analysis 01.28. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 28 Abnormal fetal heart rate patterns**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 28 Abnormal fetal heart rate patterns



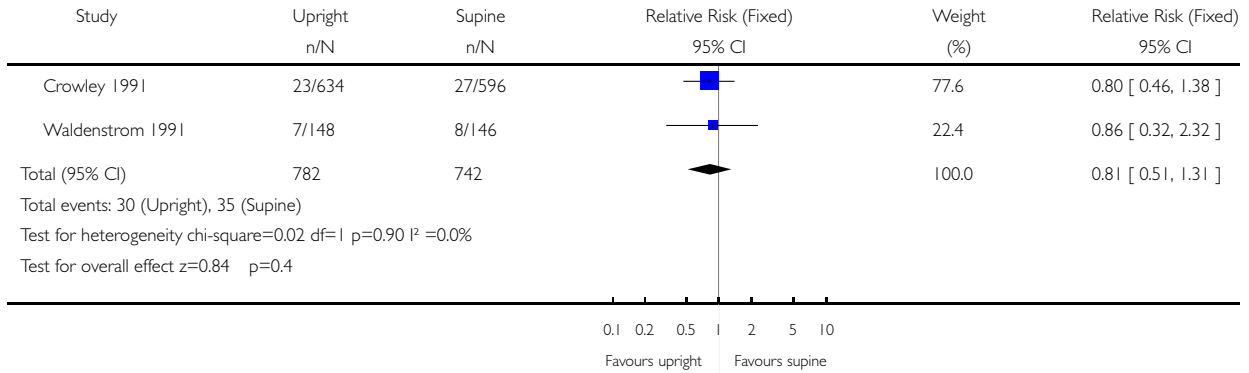


**Analysis 01.31. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 31 Admission to neonatal intensive care unit**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 31 Admission to neonatal intensive care unit

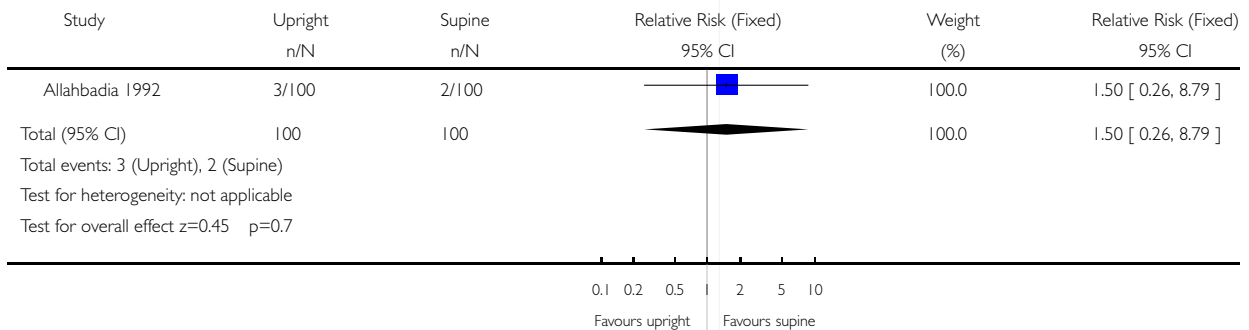


**Analysis 01.32. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 32 Birth injuries**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 32 Birth injuries

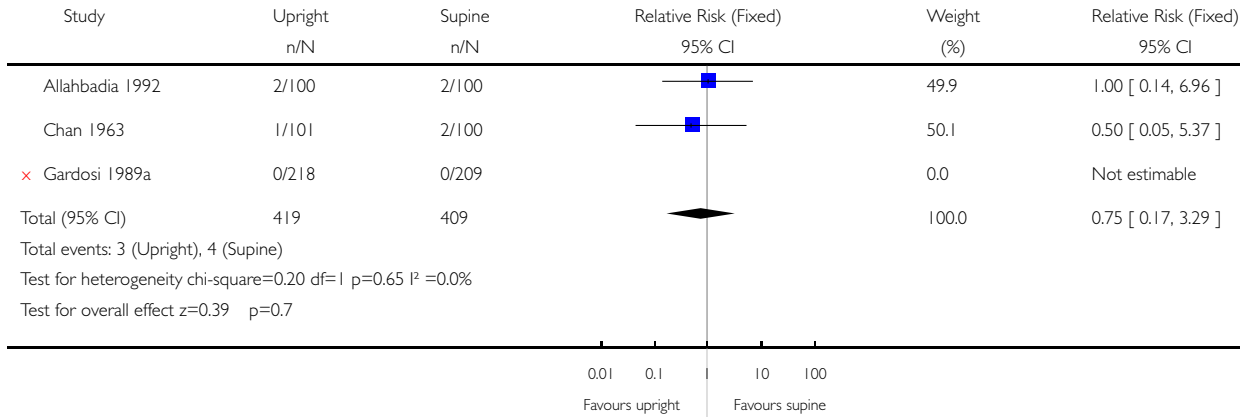


**Analysis 01.33. Comparison 01 Any upright or lateral position versus supine position/lithotomy, Outcome 33 Perinatal death**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 01 Any upright or lateral position versus supine position/lithotomy

Outcome: 33 Perinatal death

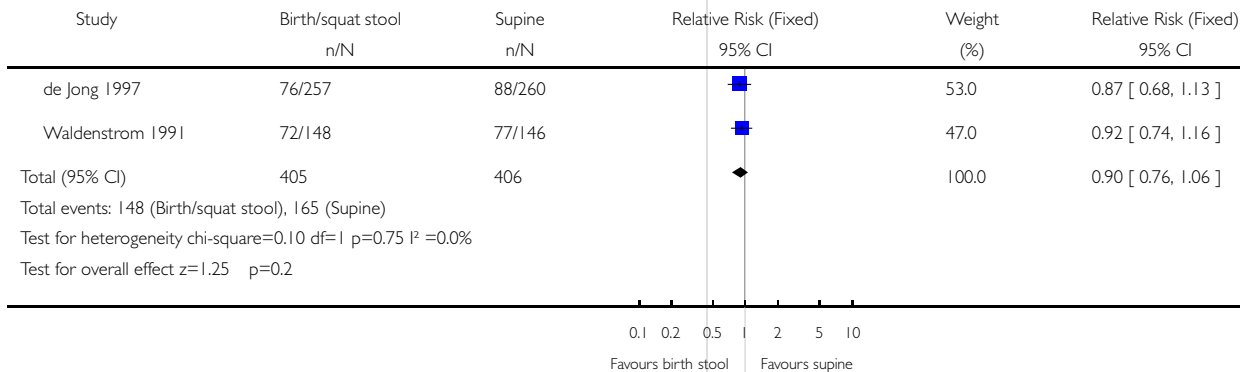


**Analysis 02.01. Comparison 02 Birth stool/squat stool versus supine position, Outcome 01 Any analgesia/ anaesthesia during second stage of labour**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 01 Any analgesia/anaesthesia during second stage of labour

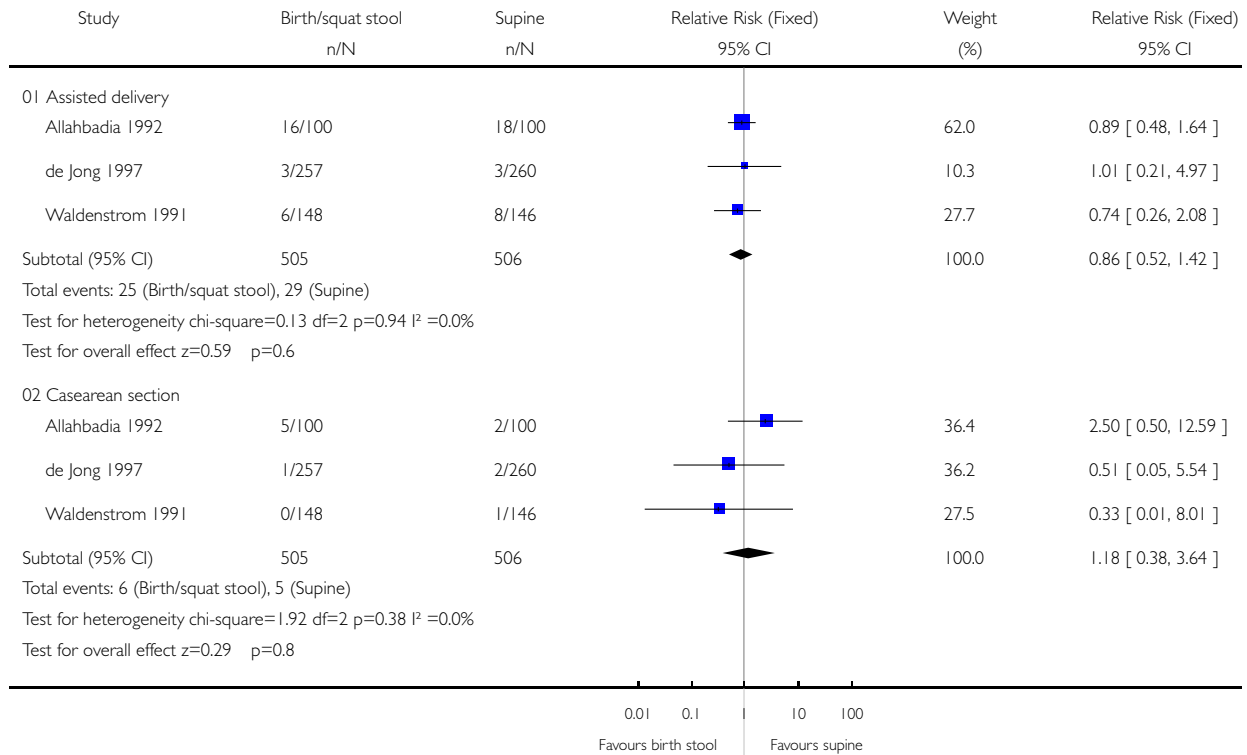


### Analysis 02.11. Comparison 02 Birth stool/squat stool versus supine position, Outcome 11 Mode of delivery

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 11 Mode of delivery

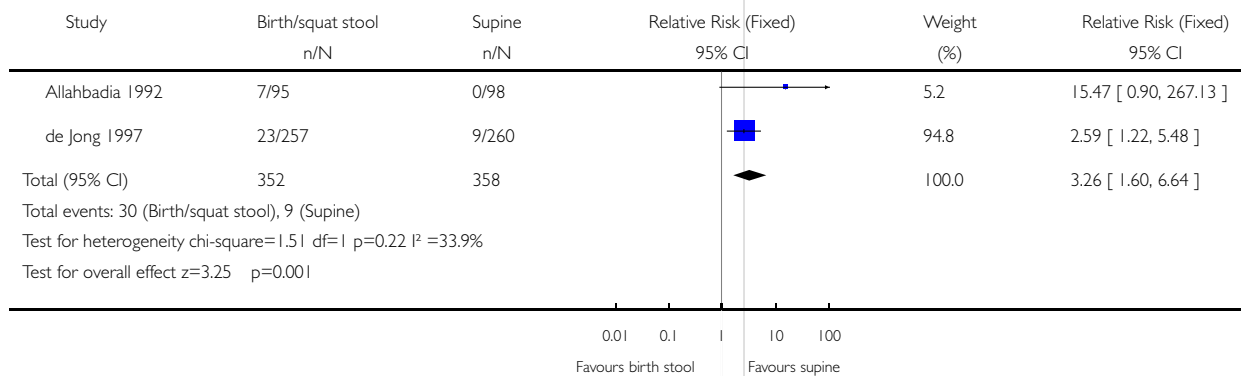


### Analysis 02.12. Comparison 02 Birth stool/squat stool versus supine position, Outcome 12 Second degree perineal tears

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 12 Second degree perineal tears

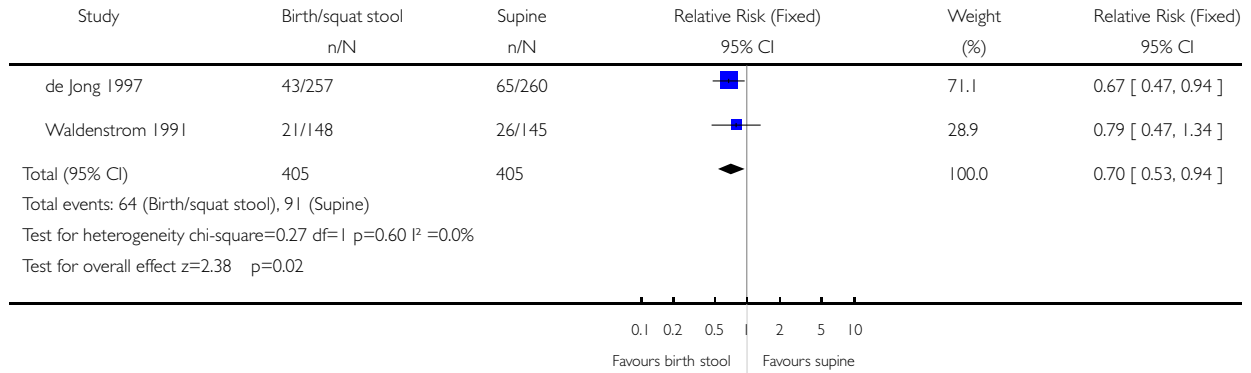


### Analysis 02.13. Comparison 02 Birth stool/squat stool versus supine position, Outcome 13 Episiotomy

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 13 Episiotomy

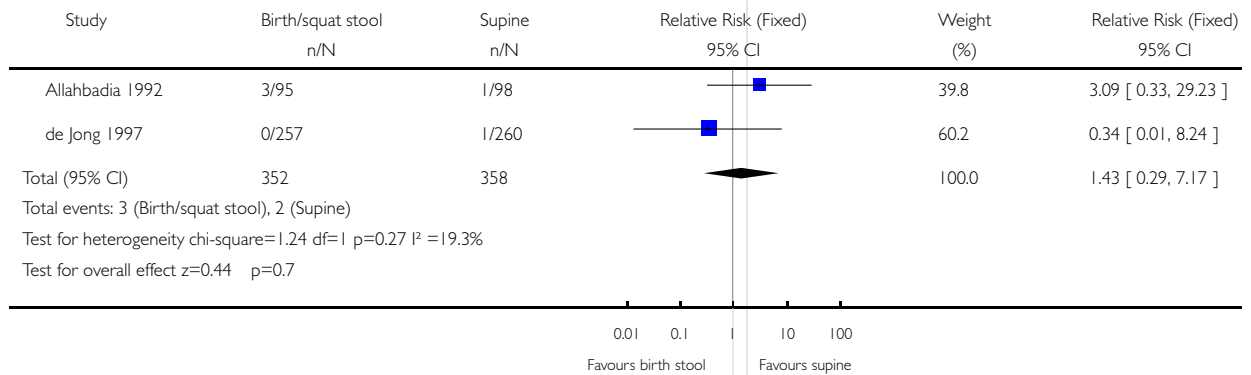


### Analysis 02.14. Comparison 02 Birth stool/squat stool versus supine position, Outcome 14 Third/fourth degree tears

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 14 Third/fourth degree tears

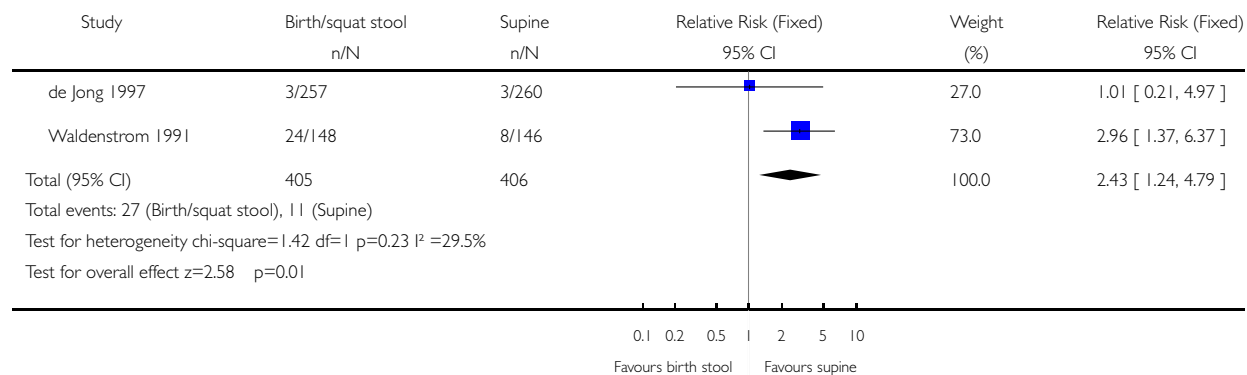


**Analysis 02.15. Comparison 02 Birth stool/squat stool versus supine position, Outcome 15 Blood loss > 500 ml**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 15 Blood loss > 500 ml

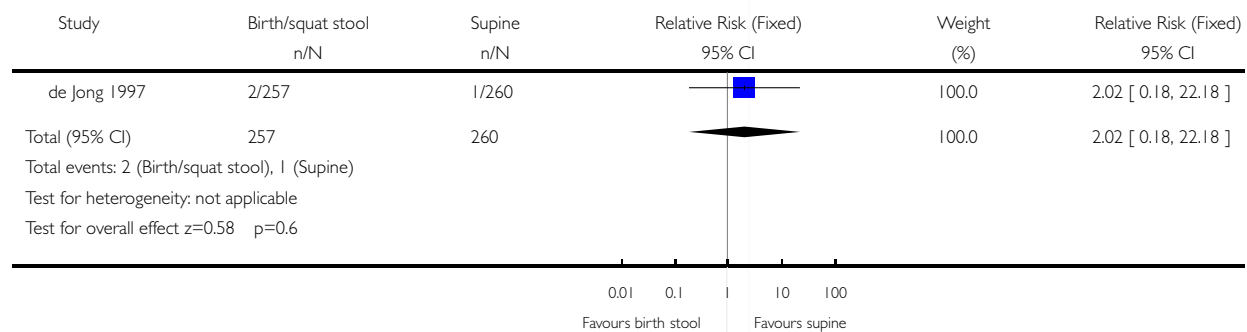


**Analysis 02.16. Comparison 02 Birth stool/squat stool versus supine position, Outcome 16 Need for blood transfusion**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 16 Need for blood transfusion

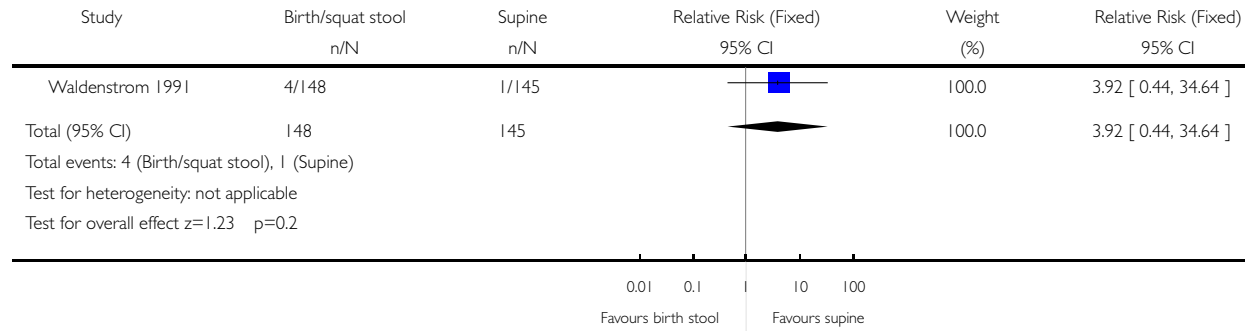


**Analysis 02.17. Comparison 02 Birth stool/squat stool versus supine position, Outcome 17 Manual removal of placenta**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 17 Manual removal of placenta

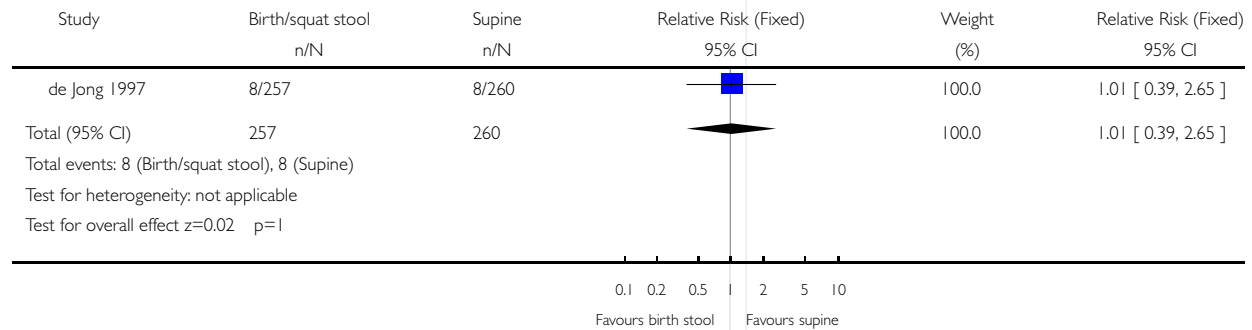


**Analysis 02.20. Comparison 02 Birth stool/squat stool versus supine position, Outcome 20 Dissatisfied with second stage of labour**

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Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 20 Dissatisfied with second stage of labour

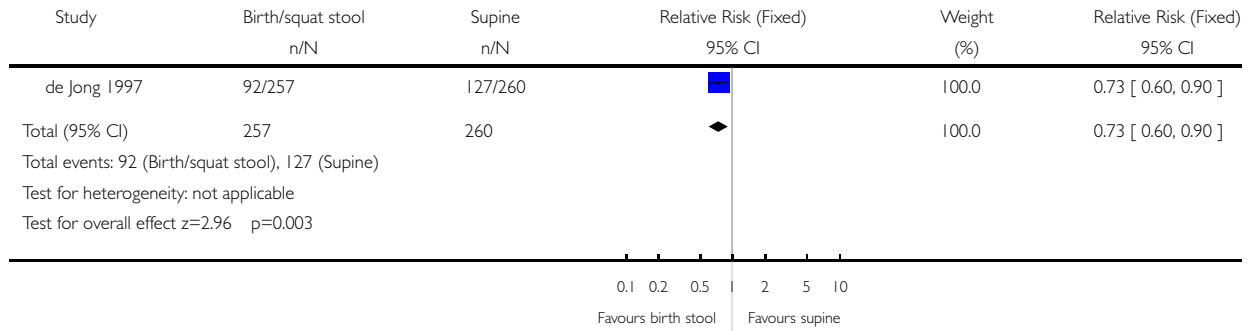


**Analysis 02.22. Comparison 02 Birth stool/squat stool versus supine position, Outcome 22 Experienced severe pain at birth**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 22 Experienced severe pain at birth

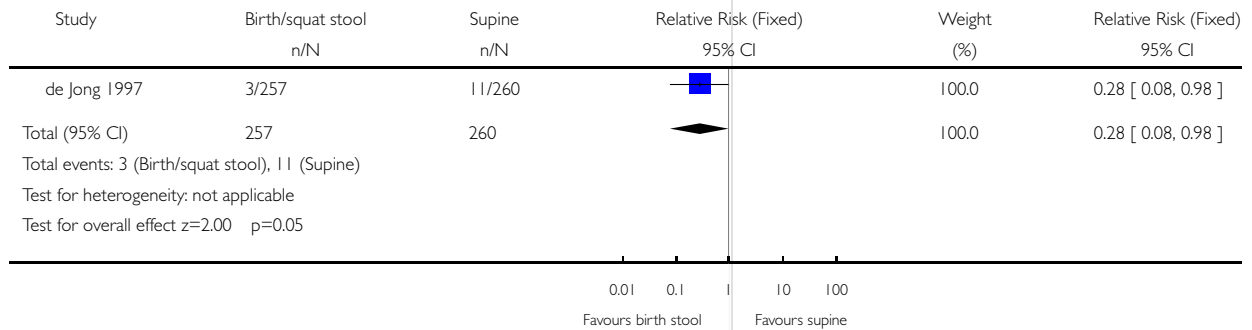


**Analysis 02.28. Comparison 02 Birth stool/squat stool versus supine position, Outcome 28 Abnormal fetal heart rate patterns**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 28 Abnormal fetal heart rate patterns

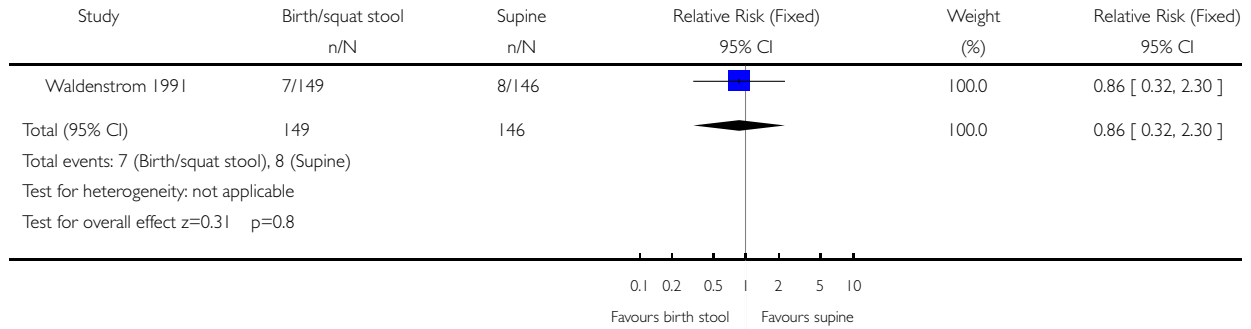


**Analysis 02.31. Comparison 02 Birth stool/squat stool versus supine position, Outcome 31 Admission to neonatal intensive care unit**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 31 Admission to neonatal intensive care unit

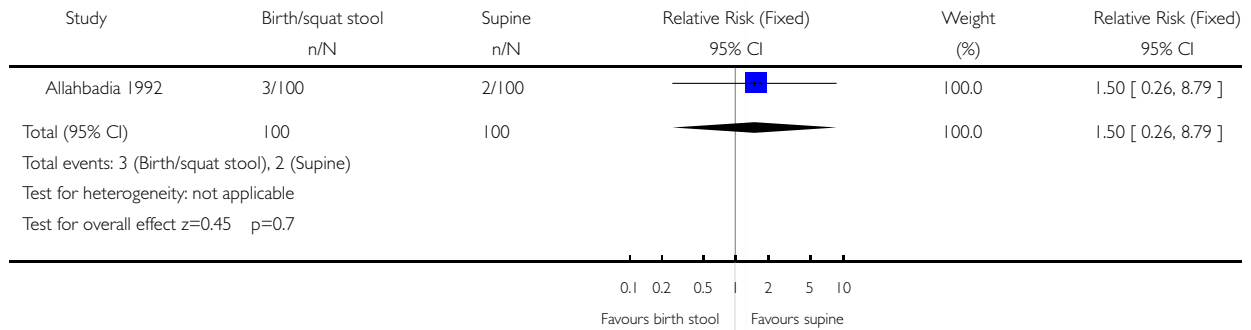


**Analysis 02.32. Comparison 02 Birth stool/squat stool versus supine position, Outcome 32 Birth injuries**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 32 Birth injuries



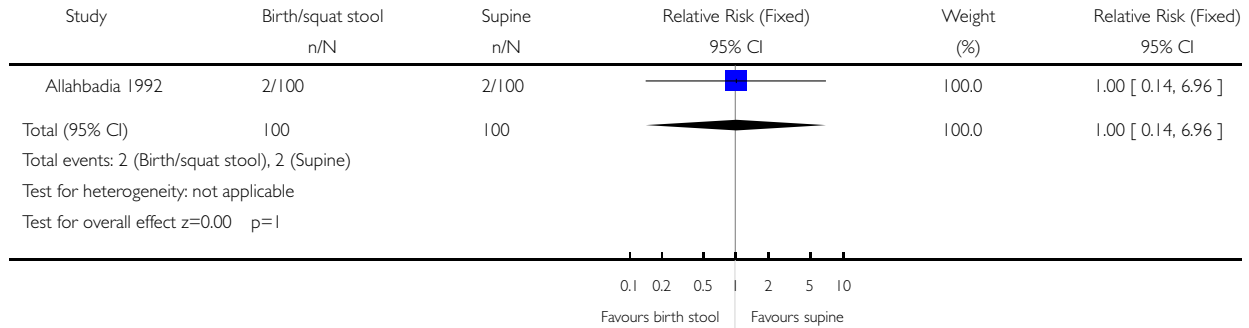


**Analysis 02.33. Comparison 02 Birth stool/squat stool versus supine position, Outcome 33 Perinatal death**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 02 Birth stool/squat stool versus supine position

Outcome: 33 Perinatal death

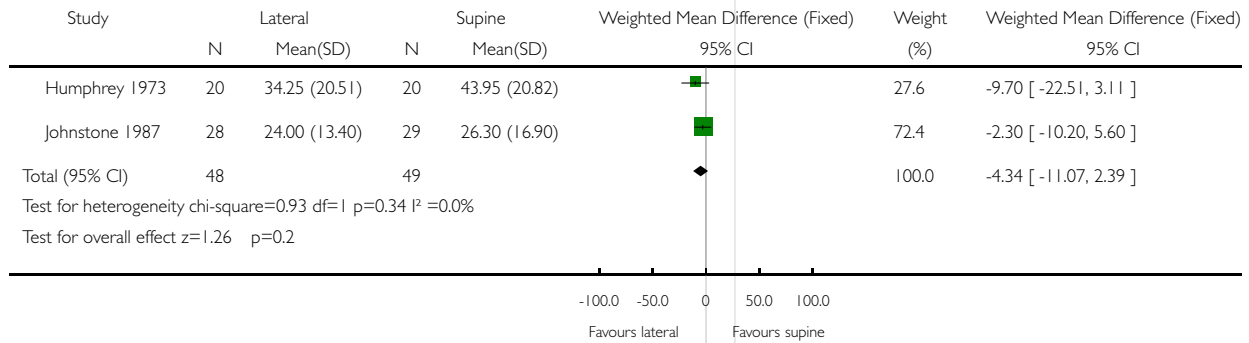


**Analysis 03.10. Comparison 03 Lateral versus supine position, Outcome 10 Duration of second stage of labour (minutes): all women**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 03 Lateral versus supine position

Outcome: 10 Duration of second stage of labour (minutes): all women

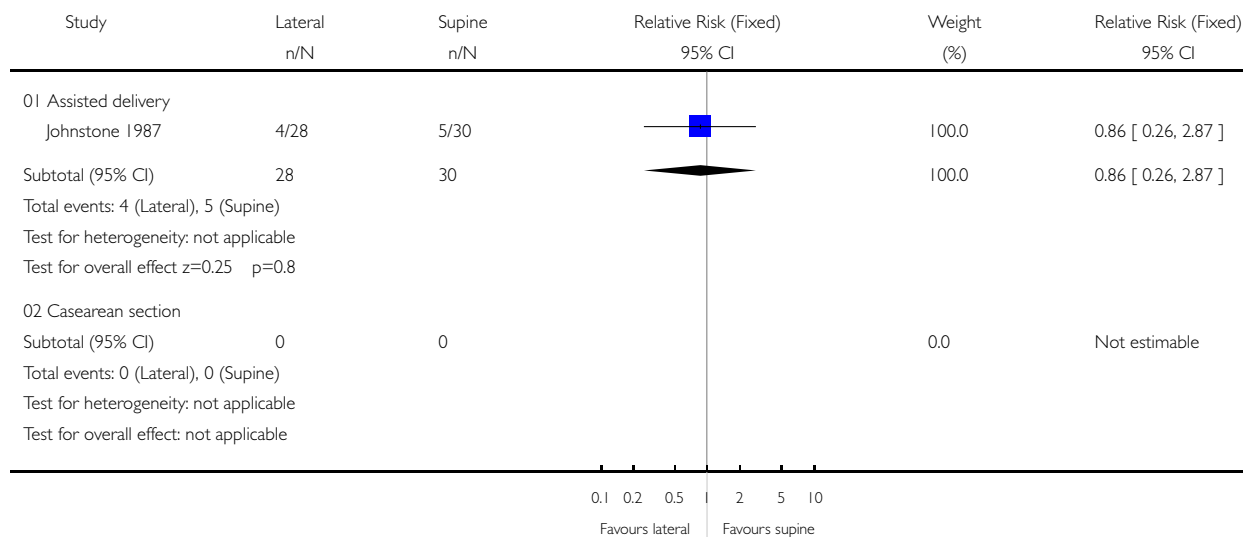


### Analysis 03.11. Comparison 03 Lateral versus supine position, Outcome 11 Mode of delivery

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 03 Lateral versus supine position

Outcome: 11 Mode of delivery

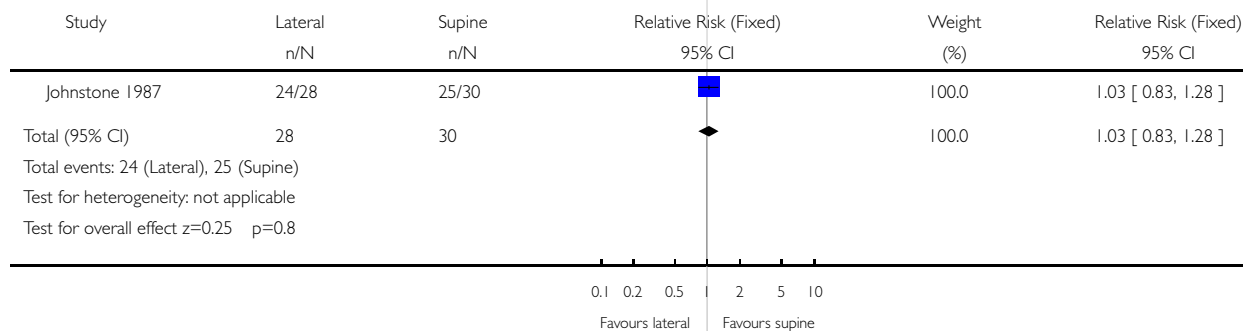


### Analysis 03.13. Comparison 03 Lateral versus supine position, Outcome 13 Episiotomy

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 03 Lateral versus supine position

Outcome: 13 Episiotomy

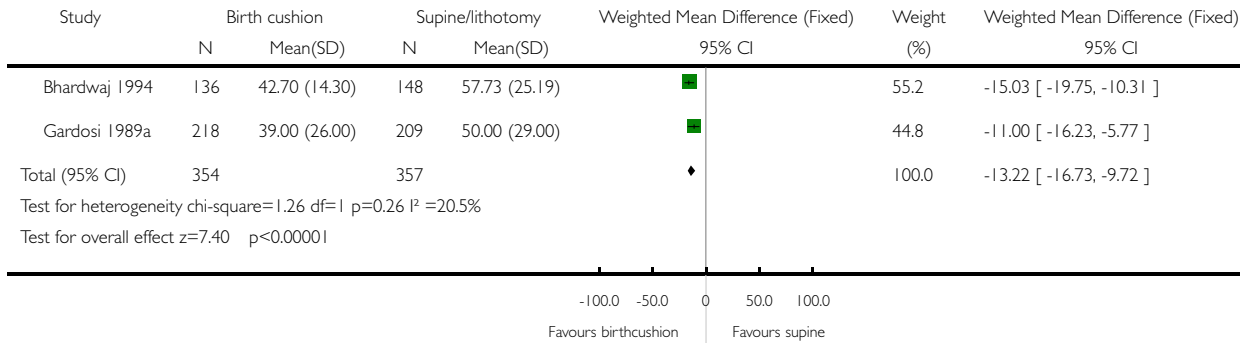


**Analysis 04.08. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 08 Duration of second stage of labour (minutes): primigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 08 Duration of second stage of labour (minutes): primigravidae

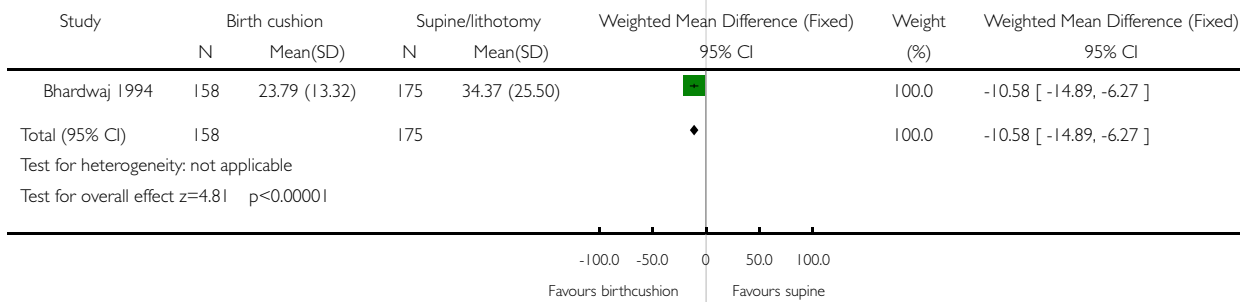


**Analysis 04.09. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 09 Duration of second stage of labour (minutes): multigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 09 Duration of second stage of labour (minutes): multigravidae

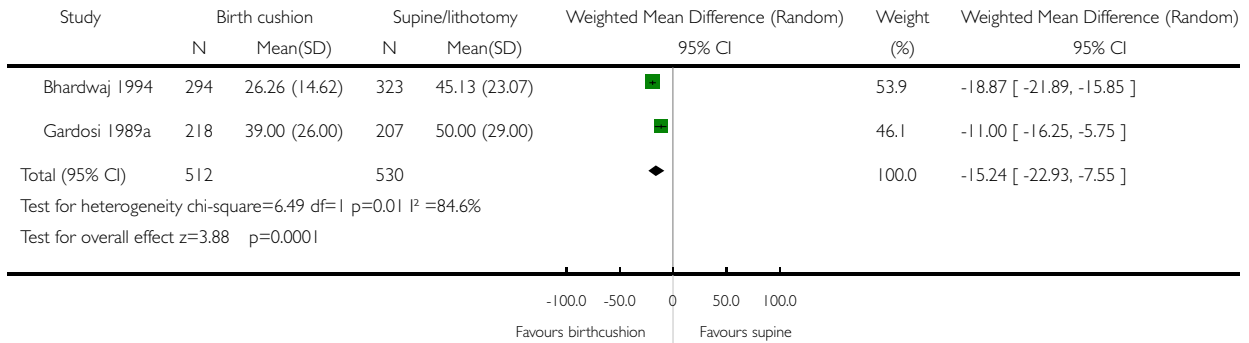


**Analysis 04.10. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 10 Duration of second stage of labour (minutes): all women**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 10 Duration of second stage of labour (minutes): all women

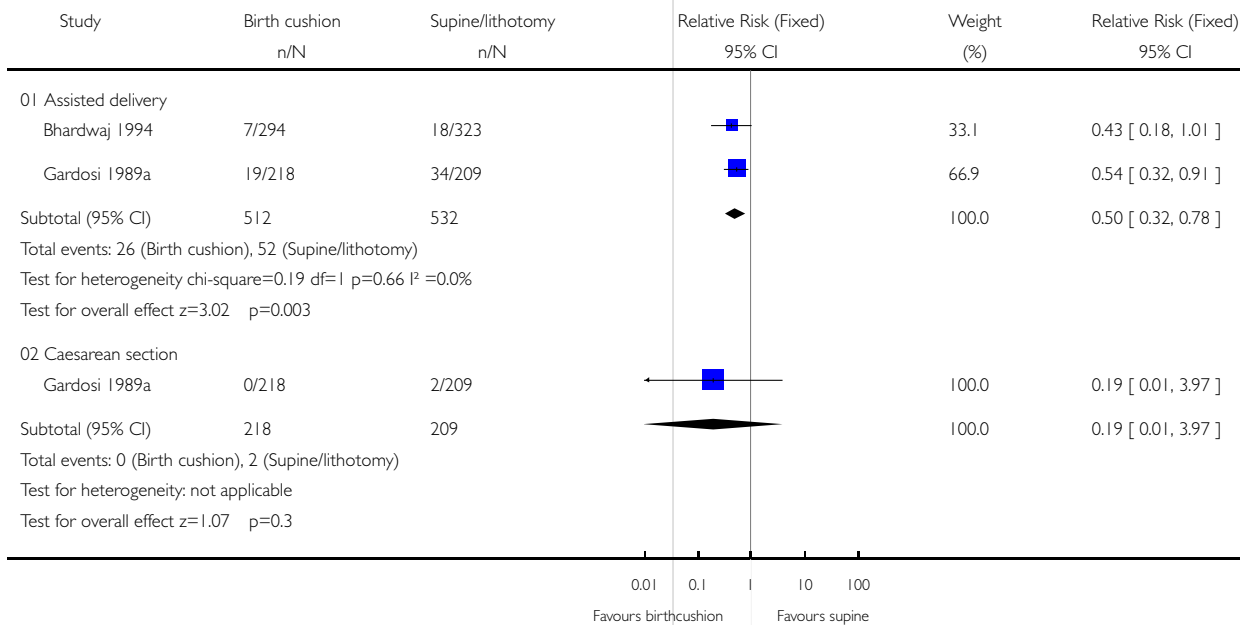


**Analysis 04.11. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 11 Mode of delivery**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 11 Mode of delivery

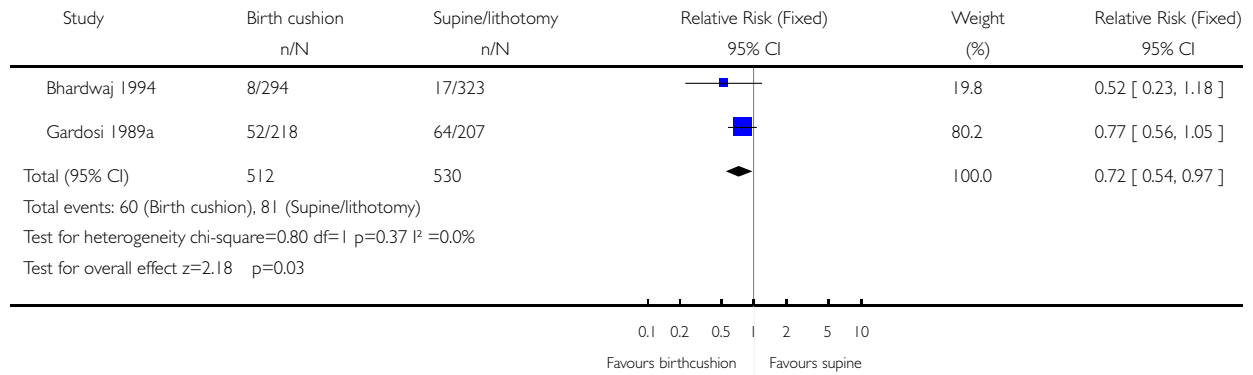


### Analysis 04.12. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 12 Second degree perineal tears

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 12 Second degree perineal tears

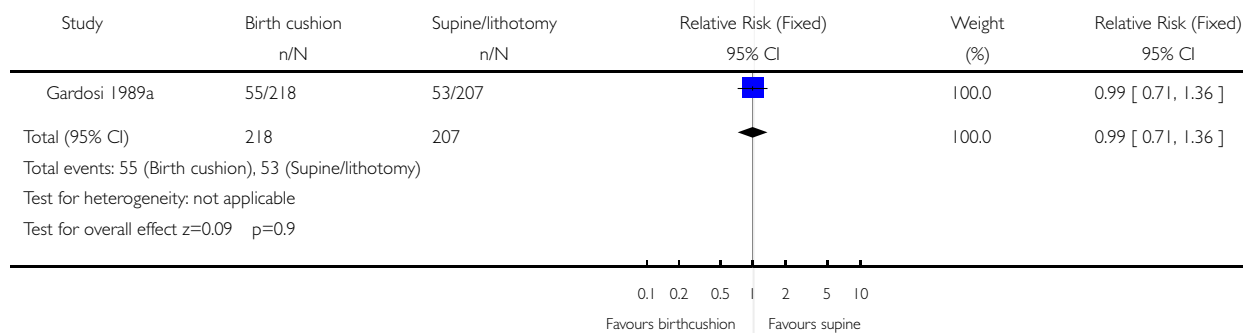


### Analysis 04.13. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 13 Episiotomy

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 13 Episiotomy

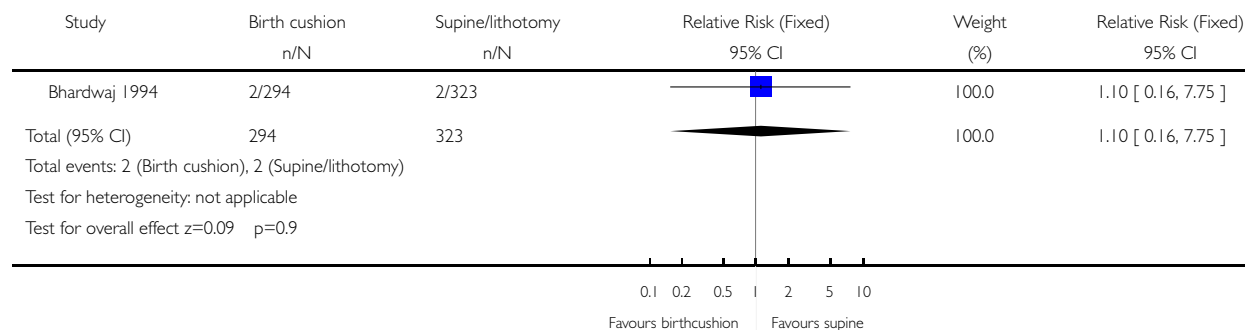


### Analysis 04.14. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 14 Third/fourth degree tears

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 14 Third/fourth degree tears

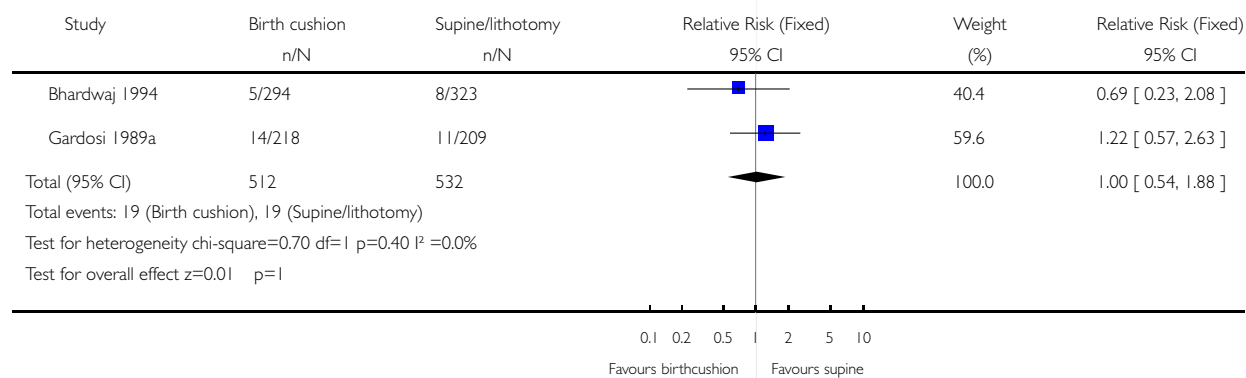


### Analysis 04.15. Comparison 04 Birth cushion versus supine/lithotomy, Outcome 15 Blood loss > 500 ml

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 04 Birth cushion versus supine/lithotomy

Outcome: 15 Blood loss > 500 ml

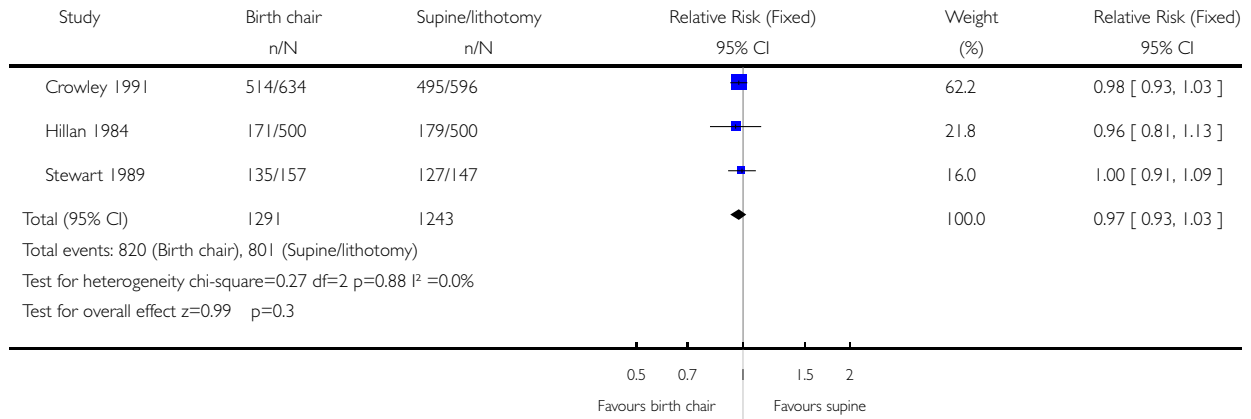


**Analysis 05.01. Comparison 05 Birth chair versus supine/lithotomy, Outcome 01 Any analgesia/anaesthesia during second stage of labour**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 01 Any analgesia/anaesthesia during second stage of labour

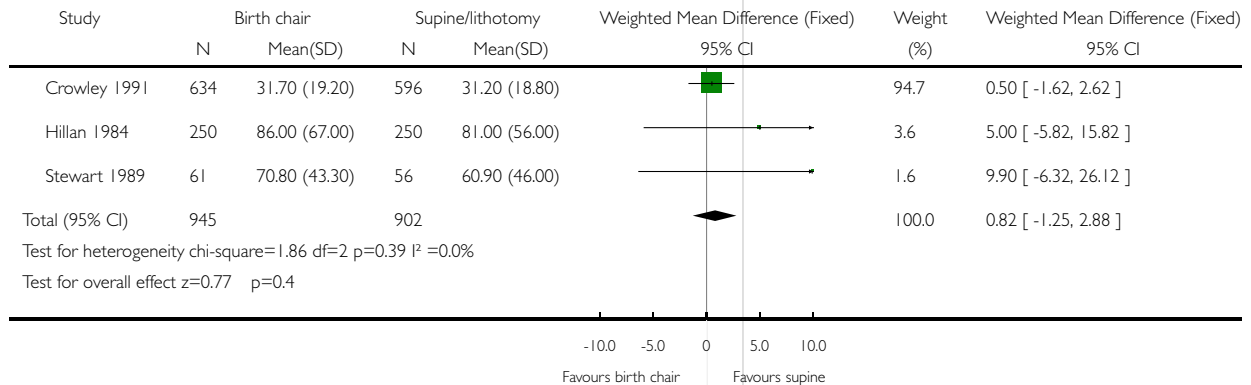


**Analysis 05.08. Comparison 05 Birth chair versus supine/lithotomy, Outcome 08 Duration of second stage of labour (minutes): primigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 08 Duration of second stage of labour (minutes): primigravidae

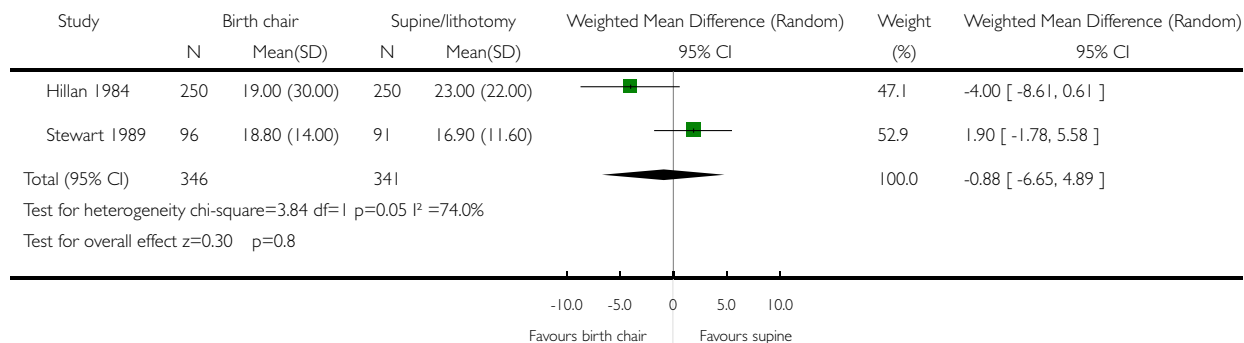


**Analysis 05.09. Comparison 05 Birth chair versus supine/lithotomy, Outcome 09 Duration of second stage of labour (minutes): multigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 09 Duration of second stage of labour (minutes): multigravidae

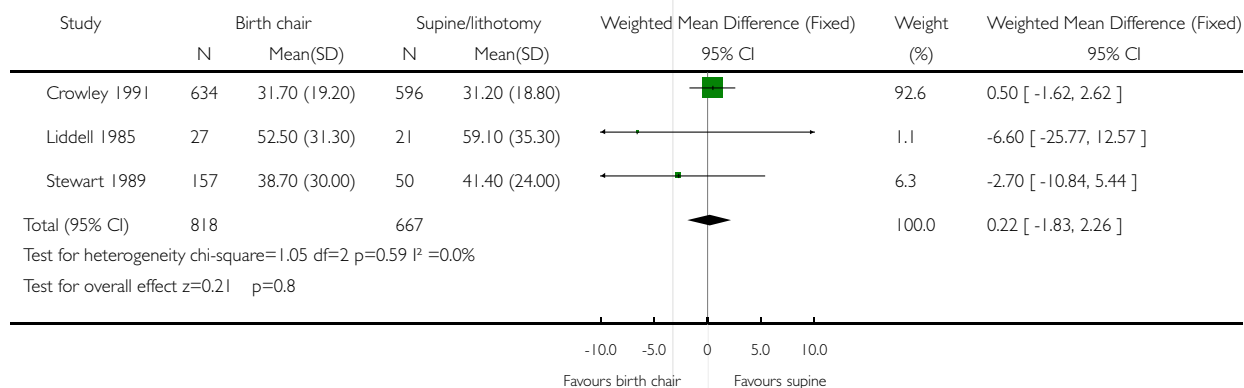


**Analysis 05.10. Comparison 05 Birth chair versus supine/lithotomy, Outcome 10 Duration of second stage of labour (minutes): all women**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 10 Duration of second stage of labour (minutes): all women



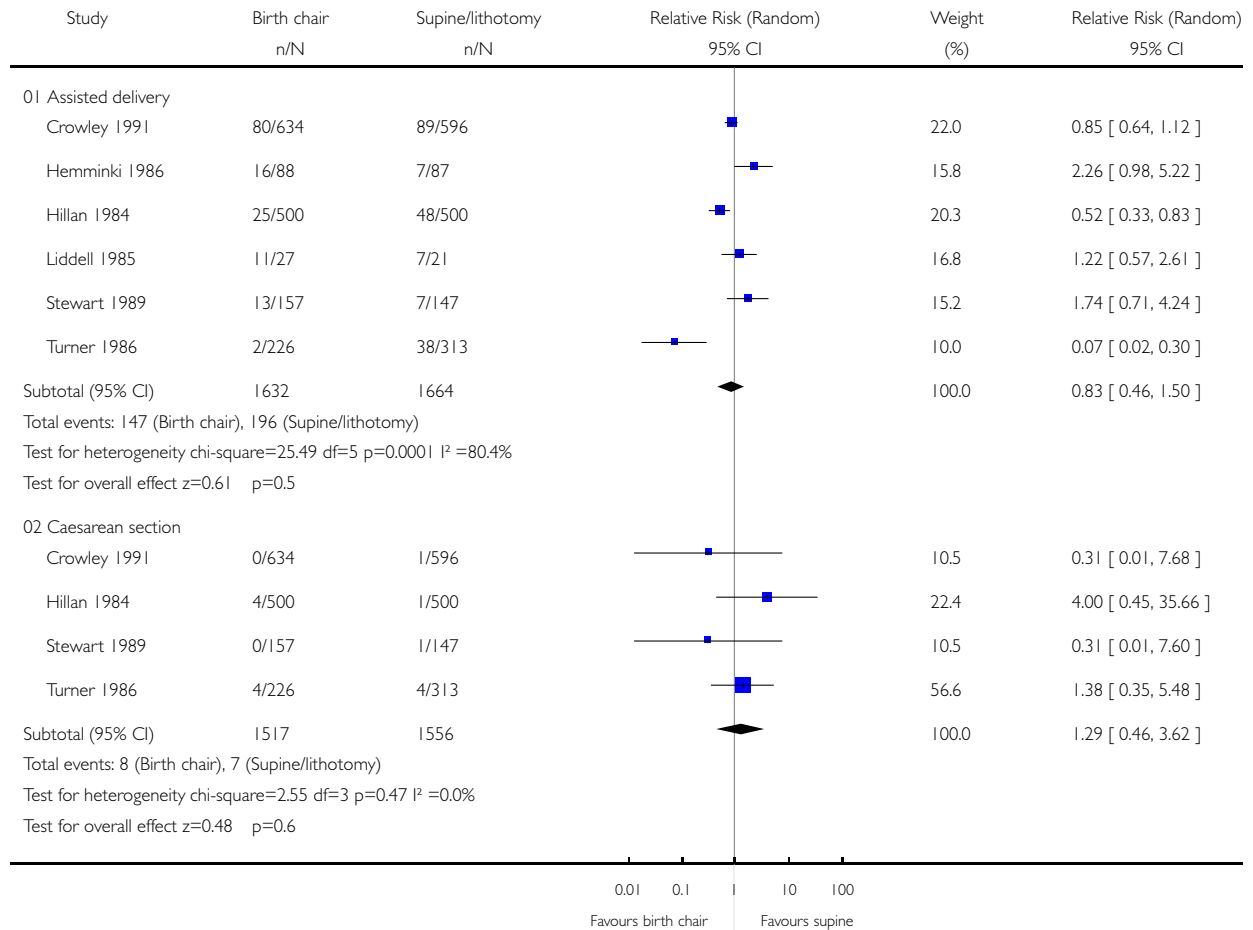


### Analysis 05.11. Comparison 05 Birth chair versus supine/lithotomy, Outcome 11 Mode of delivery

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 11 Mode of delivery

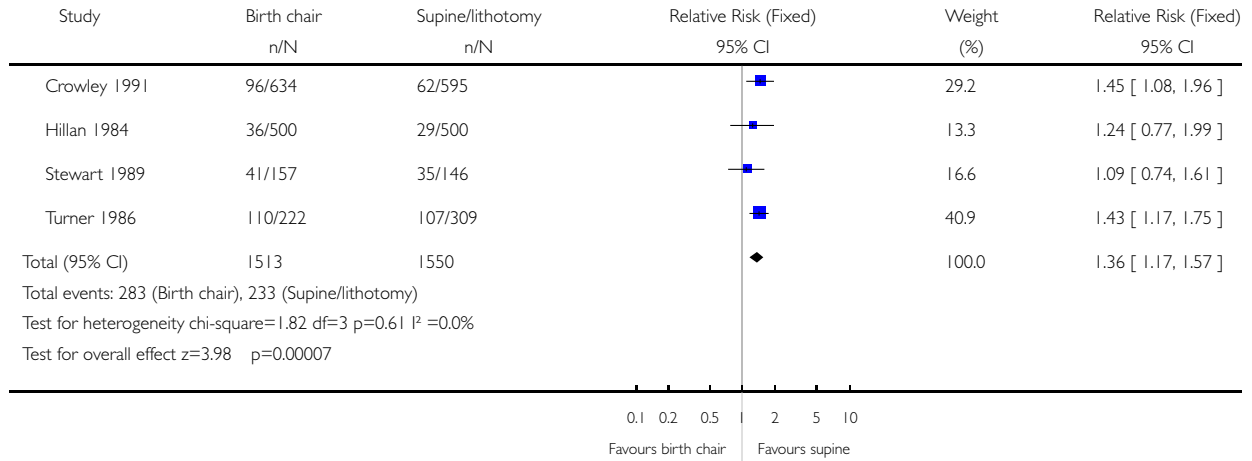


**Analysis 05.12. Comparison 05 Birth chair versus supine/lithotomy, Outcome 12 Second degree perineal tears**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 12 Second degree perineal tears

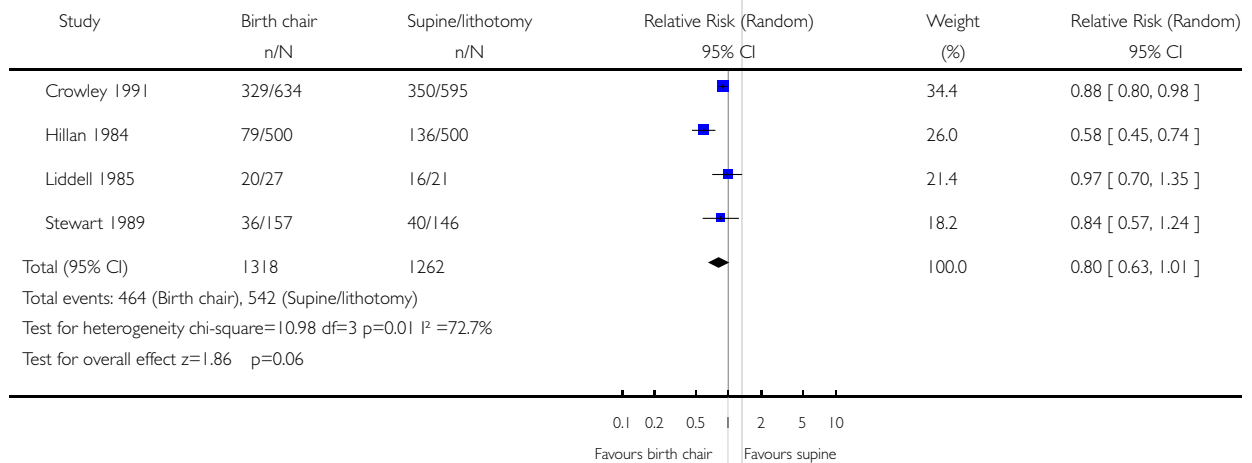


**Analysis 05.13. Comparison 05 Birth chair versus supine/lithotomy, Outcome 13 Episiotomy**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 13 Episiotomy

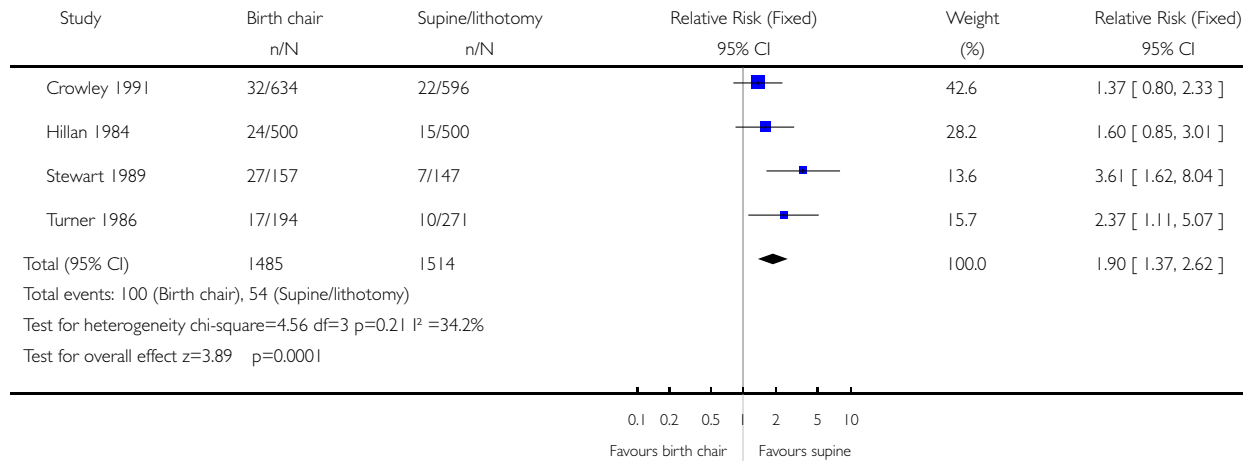


### Analysis 05.15. Comparison 05 Birth chair versus supine/lithotomy, Outcome 15 Blood loss > 500 ml

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 05 Birth chair versus supine/lithotomy

Outcome: 15 Blood loss > 500 ml

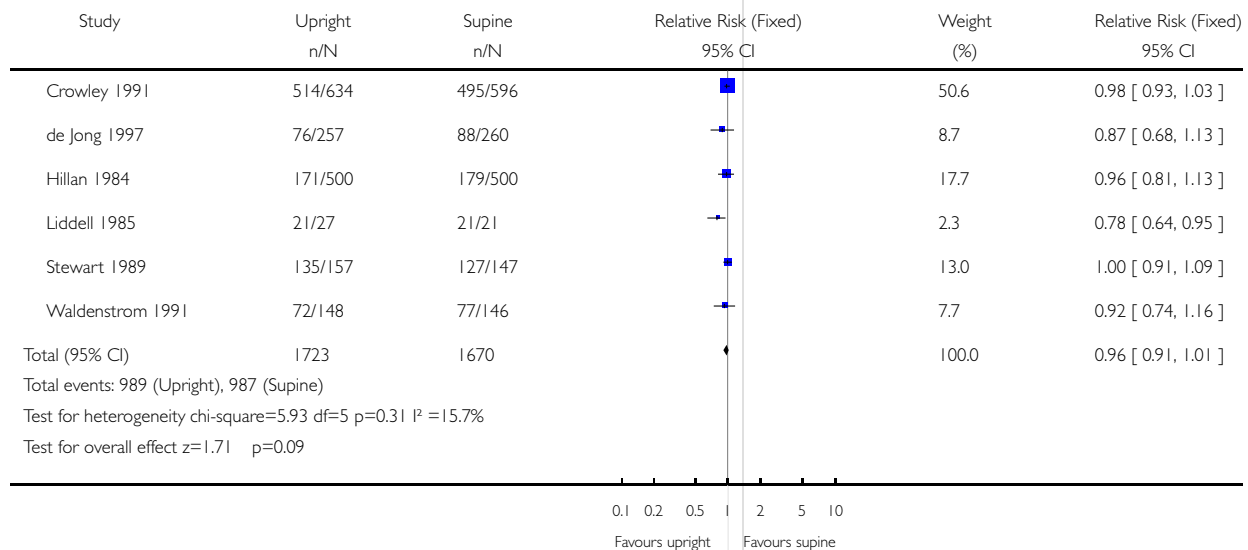


### Analysis 06.01. Comparison 06 Sensitivity analysis based on trial quality, Outcome 01 Any analgesia/ anaesthesia during second stage of labour

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 01 Any analgesia/anaesthesia during second stage of labour

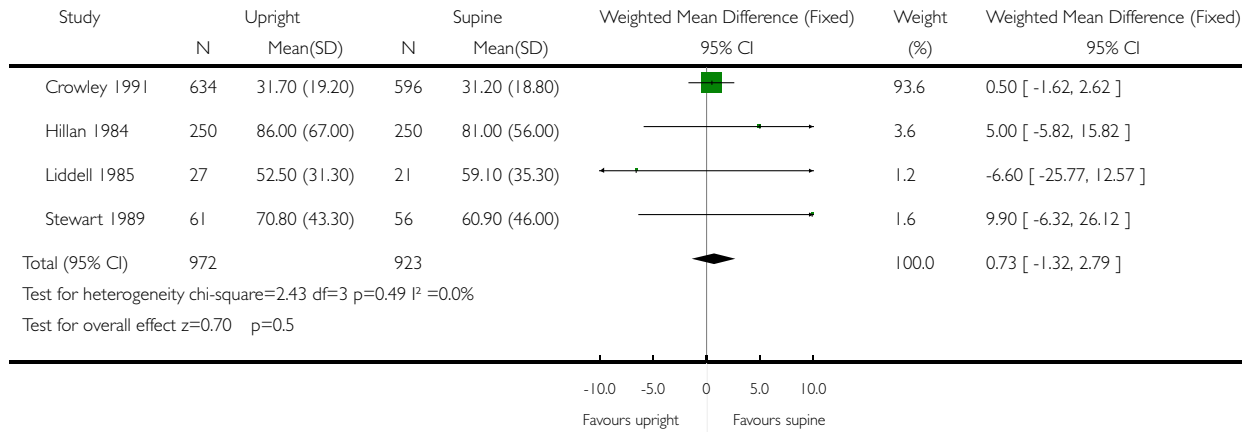


**Analysis 06.02. Comparison 06 Sensitivity analysis based on trial quality, Outcome 02 Duration of second stage of labour (minutes): primigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 02 Duration of second stage of labour (minutes): primigravidae

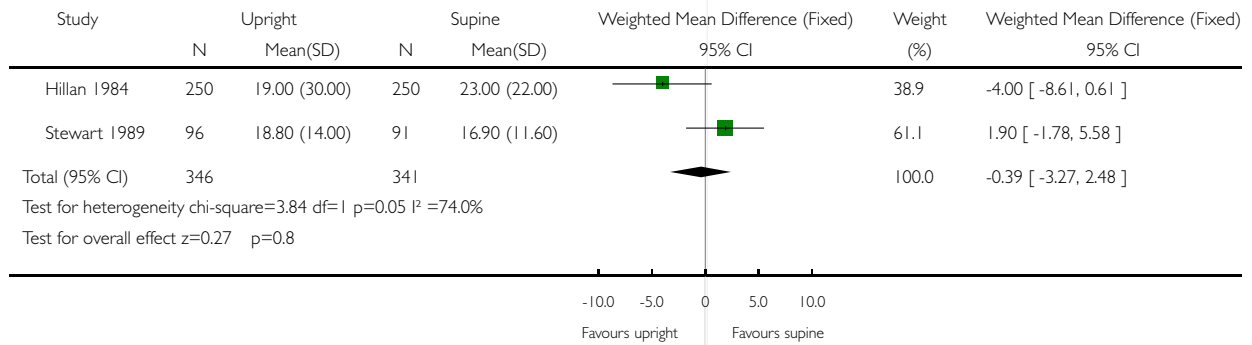


**Analysis 06.03. Comparison 06 Sensitivity analysis based on trial quality, Outcome 03 Duration of second stage of labour (minutes): multigravidae**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 03 Duration of second stage of labour (minutes): multigravidae

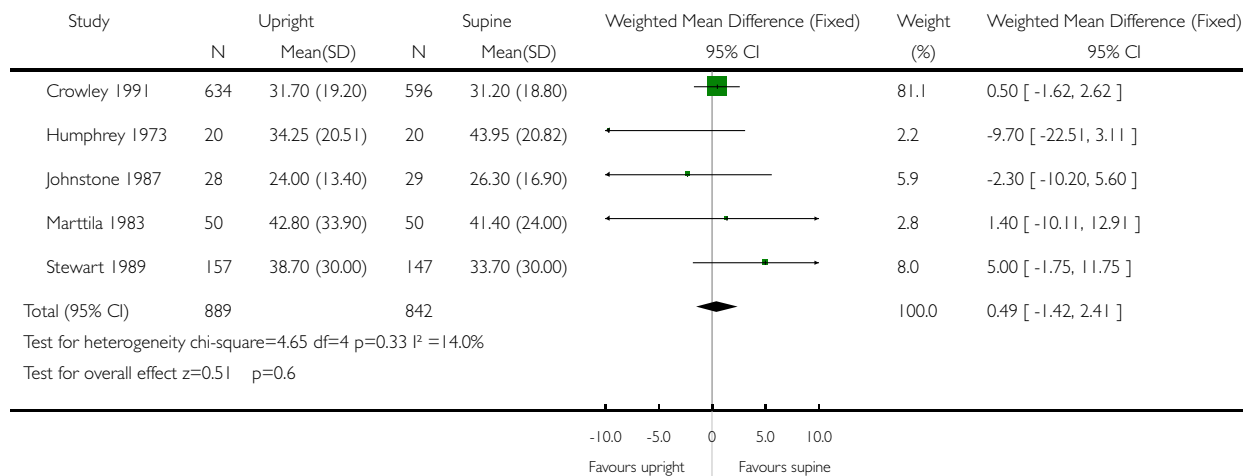


**Analysis 06.04. Comparison 06 Sensitivity analysis based on trial quality, Outcome 04 Duration of second stage of labour (minutes): all women**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 04 Duration of second stage of labour (minutes): all women

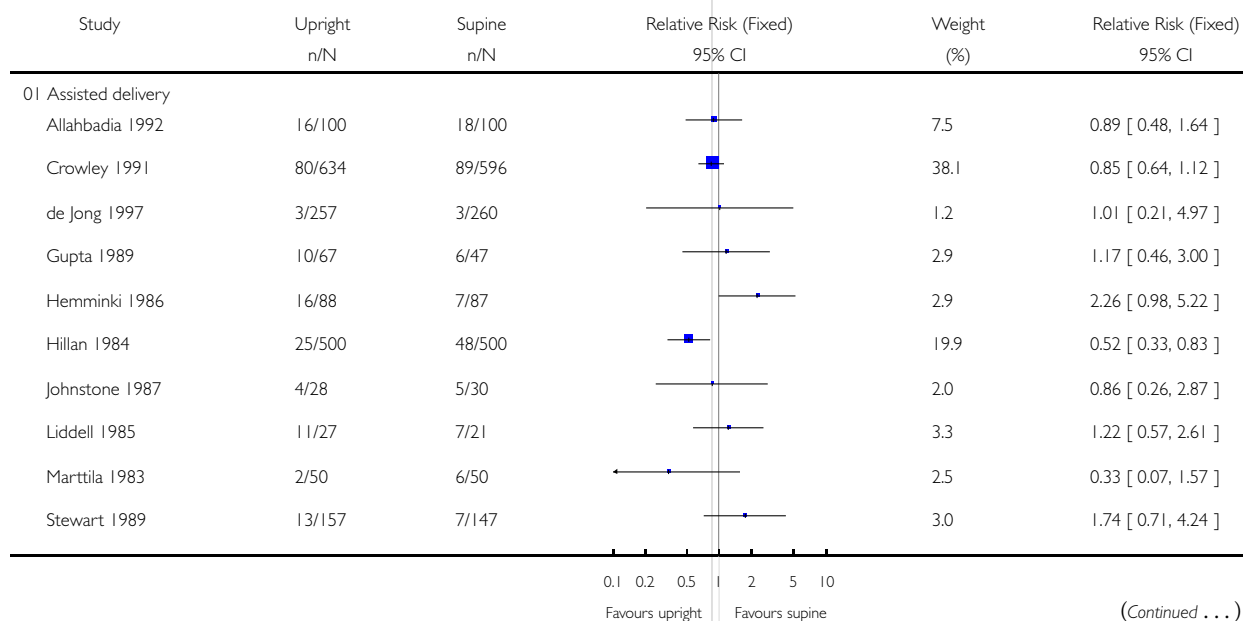


**Analysis 06.05. Comparison 06 Sensitivity analysis based on trial quality, Outcome 05 Mode of delivery**

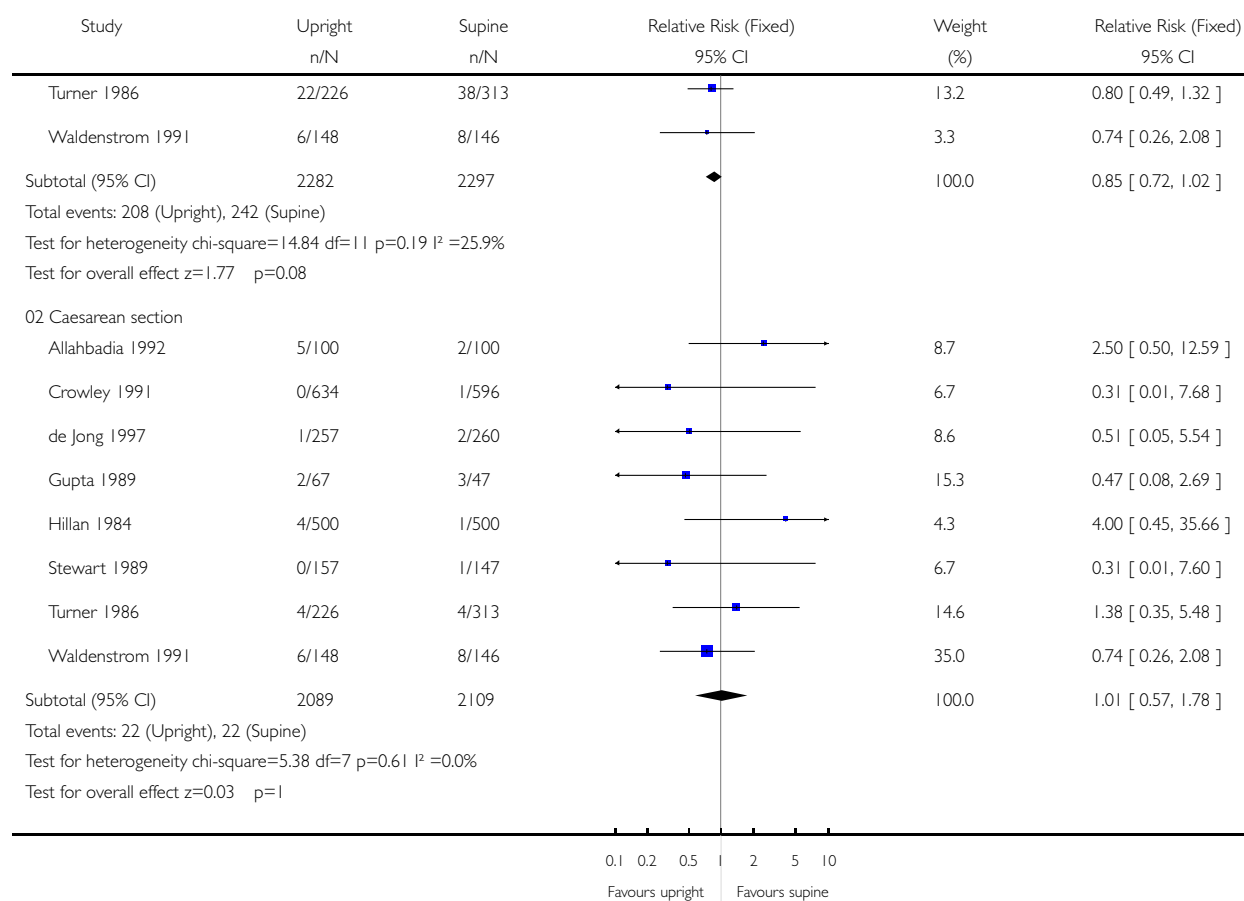
Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 05 Mode of delivery



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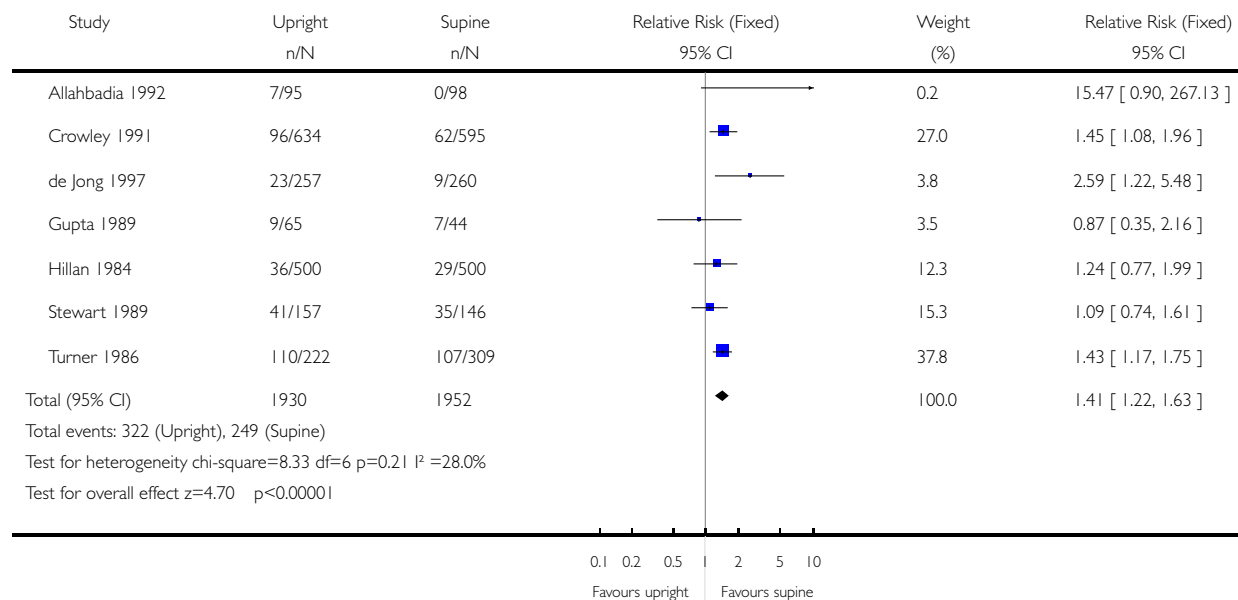


### Analysis 06.06. Comparison 06 Sensitivity analysis based on trial quality, Outcome 06 Second degree perineal tears

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 06 Second degree perineal tears

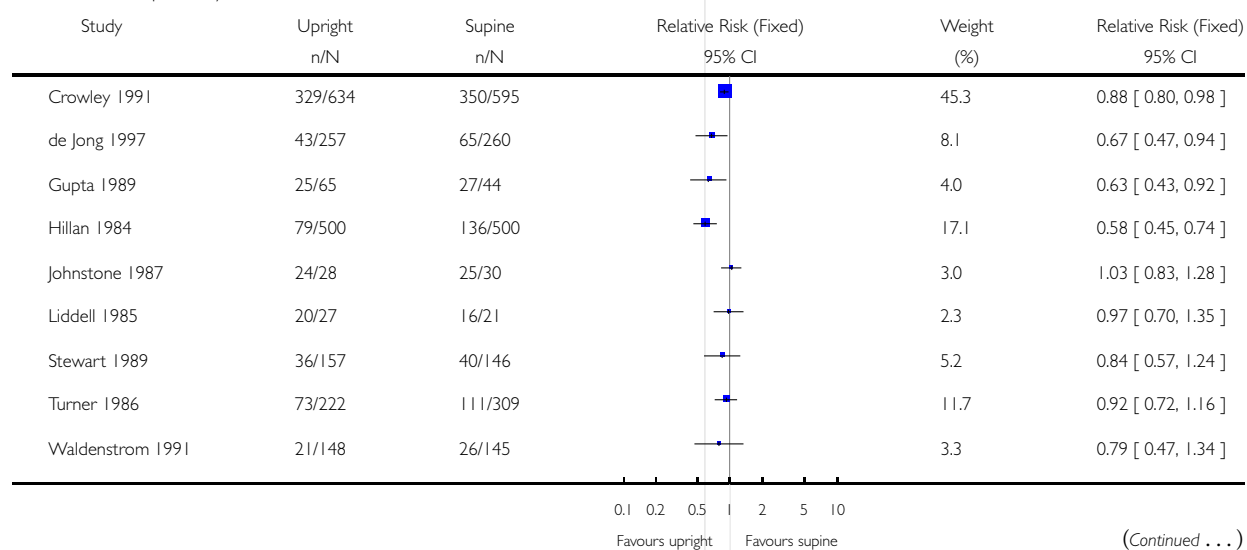


### Analysis 06.07. Comparison 06 Sensitivity analysis based on trial quality, Outcome 07 Episiotomy

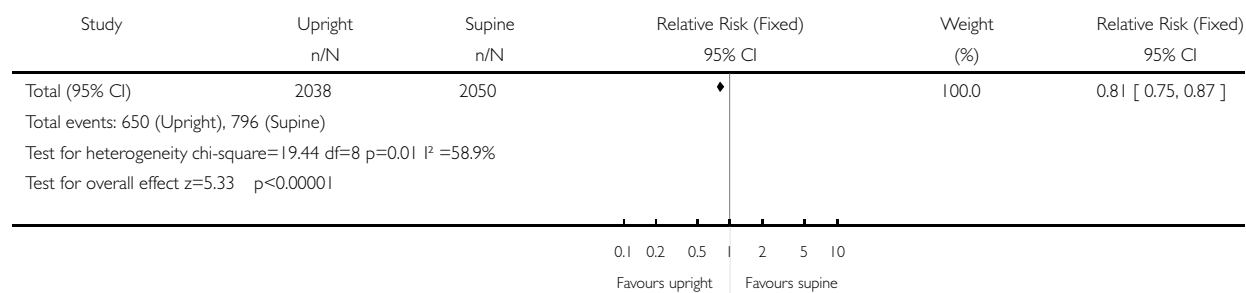
Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 07 Episiotomy



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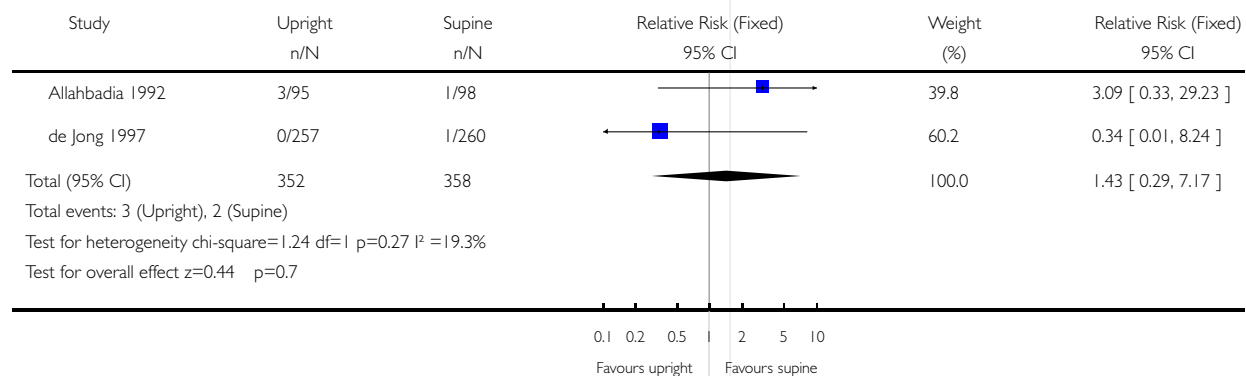


**Analysis 06.08. Comparison 06 Sensitivity analysis based on trial quality, Outcome 08 Third/fourth degree tears**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 08 Third/fourth degree tears



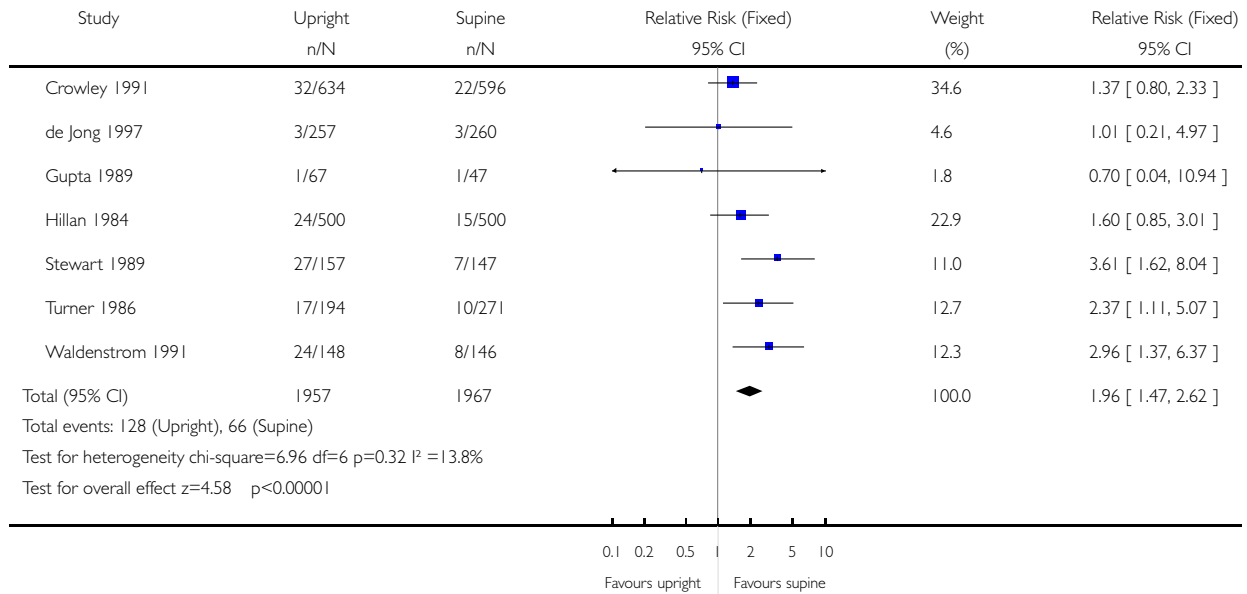


### Analysis 06.09. Comparison 06 Sensitivity analysis based on trial quality, Outcome 09 Blood loss > 500 ml

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 09 Blood loss > 500 ml

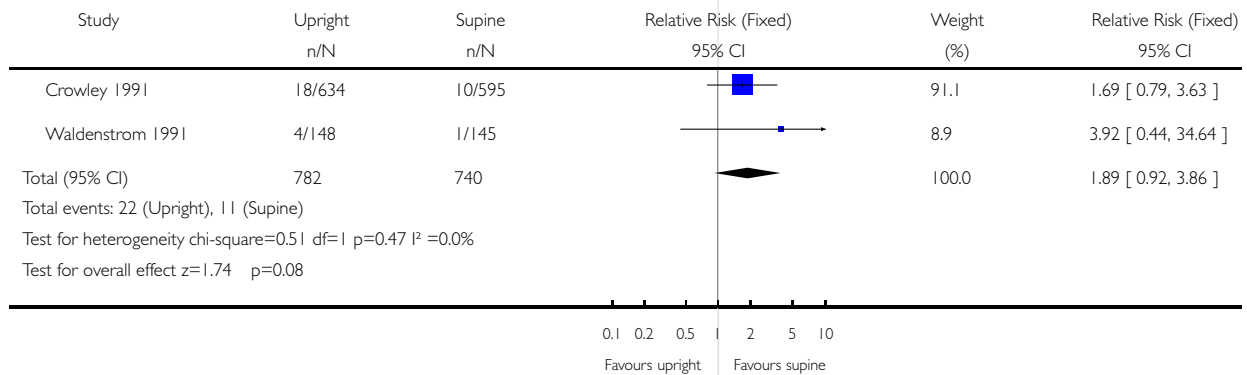


### Analysis 06.10. Comparison 06 Sensitivity analysis based on trial quality, Outcome 10 Manual removal of placenta

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 10 Manual removal of placenta



**Analysis 06.11. Comparison 06 Sensitivity analysis based on trial quality, Outcome 11 Perinatal death**

Review: Position in the second stage of labour for women without epidural anaesthesia

Comparison: 06 Sensitivity analysis based on trial quality

Outcome: 11 Perinatal death

