Umbilical vein injection for management of retained placenta (Review)

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ABSTRACT

Background
If a retained placenta is left untreated, there is a high risk of maternal death. However, manual removal of the placenta is an invasive procedure with its own serious complications of haemorrhage, infection or genital tract trauma.

Objectives
The objective of this review was to assess the use of umbilical vein injection of saline solution alone or with oxytocin in comparison either with expectant management or with an alternative solution or other uterotonic agent for retained placenta. The main comparisons include the following agents: saline solution alone, saline solution plus oxytocin, saline solution plus prostaglandin and plasma expander.

Search strategy
We searched the Cochrane Pregnancy and Childbirth Group trials register and the Cochrane Controlled Trials Register (latest search 20 March 2001).

Selection criteria
Randomised trials comparing umbilical vein injection of saline or other fluids, with or without oxytocics, either with expectant management or with an alternative solution or other uterotonic agent, in the management of retained placenta.

Data collection and analysis
The two reviewers assessed trial quality and extracted data.

Main results
Twelve trials were included. The trials were of variable quality. Compared with expectant management, umbilical vein injection of saline solution alone did not show any significant difference in the incidence of manual removal of the placenta (relative risk (RR): 0.97; 95% confidence interval (CI): 0.83 to 1.14). Umbilical vein injection of saline solution plus oxytocin compared with expectant management showed a reduction in manual removal, although this was not statistically significant (RR: 0.86; 95% CI: 0.72 to 1.01). Saline solution with oxytocin compared with saline solution alone showed a significant reduction in manual removal of the placenta (RR: 0.79; 95% CI: 0.69 to 0.91) (number needed to treat: 8; 95% CI: 5 to 20). No discernible difference was detected in length of third stage of labour, blood loss, haemorrhage, haemoglobin, blood transfusion, curettage, infection, hospital stay, fever, abdominal pain and oxytocin augmentation. Umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of plasma expander showed higher, but not statistically significant, incidence of manual removal of placenta (RR: 1.34; 95% CI: 0.97 to 1.85) and no difference in blood loss but there is only one small trial contributing to this comparison. Saline solution plus prostaglandin, compared with saline solution alone, was associated with a statistically significant lower incidence in manual removal of placenta (RR: 0.05; 95% CI: 0.00 to 0.73) but no difference was observed in blood loss, fever, abdominal pain, and oxytocin augmentation but there is only one small trial contributing to these results. There were no significant differences between saline solution plus prostaglandin and saline solution plus oxytocin (RR: 0.10; 95% CI: 0.01 to 1.59) but again there is only one small trial contributing to this meta-analysis.

Authors' conclusions
Umbilical vein injection of saline solution plus oxytocin appears to be effective in the management of retained placenta. Saline solution alone does not appear be more effective than expectant management. Further research into umbilical vein injection of oxytocin, prostaglandins or plasma expander is warranted.

PLAIN LANGUAGE SUMMARY

Some evidence that an injection of oxytocin into the umbilical vein may reduce the need for manual removal of retained placenta after childbirth

The placenta provides nourishment for the baby in the womb (uterus) through the umbilical cord. It is usually delivered shortly after the baby. If the placenta remains in the womb (retained placenta), women have an increased risk of bleeding heavily (haemorrhage), infection and very occasionally death. Manual removal of the placenta involves an operation to remove the placenta, but it can have adverse effects. The review of trials found some evidence that an injection of oxytocin into the umbilical cord may reduce the need for manual removal of the retained placenta. Further research is needed into the effects of injections of oxytocin, or prostaglandin or plasma expander solution.

BACKGROUND

Normally the uterine contractions that occur immediately after the delivery of the baby result in the spontaneous detachment of the placenta from the uterine wall and subsequently delivered. The term retained placenta is used when the placenta has not been delivered within one hour after the birth of the baby (WHO 1990). Retained placenta is a potentially life-threatening complication of the third stage of labour. If untreated, as may happen after home births in developing countries, there is a high risk of maternal death from haemorrhage or infection. The current standard management of retained placenta, by manual removal, aims to prevent these problems, but it is unsatisfactory. Manual removal involves the clinician passing a hand through the vagina into the cavity of uterus, and usually requires general or regional anaesthesia in hospital. It is an invasive procedure with its own serious complications of haemorrhage, infection or genital tract trauma. Any management simple and safe enough to be performed at the place of delivery which reduces the need for manual removal of placenta could be of major benefit to women world-wide. The umbilical vein injection of some fluid alone or plus an uterotonic drug (to induce uterine contractions) seems a promising intervention. It is simple to inject into the large umbilical vein in the cord, after separation of the baby.

Umbilical vein injection for the management of retained placenta was first described by Mojon and Asdrubali in 1826 (Koerting 1926). In the early twentieth century, various authors reported on the use of umbilical vein injection of saline solution 0.9% with volumes that have varied widely between 200 and 400 ml (Gabaston 1914; Jarcho 1928). Recent studies have concentrated on smaller volumes of umbilical vein injection of 0.9% saline solution plus oxytocin, although most of these were uncontrolled (Neri 1966; Golan 1983; Golan 1984; Heinonen 1985; Hauksson 1986).

The hypothesised beneficial effect of the umbilical vein injection is that it may reduce the need for manual removal of the placenta (Carroli 1991).

The aim of this review is to evaluate the available evidence about the possible benefits and risks of the use of umbilical vein injection versus expectant management for retained placenta. Also evaluated are the benefits and risks of the use of umbilical injection with different fluids and umbilical vein injection with different uterotonic drugs. The uterotonic drugs are those that increase the uterine tone and/or contractility (ergot alkaloids, oxytocin and prostaglandins).

OBJECTIVES

To determine the possible benefits and risks of the use of umbilical vein injection for retained placenta. We considered retained placenta to be the indication for umbilical vein injection when the injection was administered 15 minutes or more after the delivery of the baby.

The following comparisons were made:

1. umbilical vein injection of saline solution versus expectant management;
2. umbilical vein injection of saline solution plus oxytocin versus expectant management;
3. umbilical vein injection of saline solution plus oxytocin versus umbilical vein injection of saline solution;
4. umbilical vein injection of saline solution plus oxytocin versus umbilical vein injection of plasma expander;

5. umbilical vein injection of saline solution plus prostaglandin versus umbilical vein injection of saline solution;
6. umbilical vein injection of saline solution plus prostaglandin versus umbilical vein injection of saline solution plus oxytocin.

Hypotheses:

1. umbilical vein injection of saline solution compared with expectant management for retained placenta will improve the outcomes cited under 'Types of outcome measures';
2. umbilical vein injection of saline solution plus oxytocin compared with expectant management will improve the outcomes cited under 'Types of outcome measures';
3. umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of saline solution will improve the outcomes cited under 'Types of outcome measures';
4. umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of plasma expander will improve the outcomes cited under 'Types of outcome measures';
5. umbilical vein injection of saline solution plus prostaglandin compared with umbilical vein injection of saline solution will improve the outcomes cited under 'Types of outcome measures';
6. umbilical vein injection of saline solution plus prostaglandin compared with umbilical vein injection of saline solution plus oxytocin will improve the outcomes cited under 'Types of outcome measures'.

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

Any adequately randomized controlled trial comparing umbilical vein injection of saline or other fluids, with or without oxytocics, either with expectant management or with an alternative solution or other uterotonic agent, in the management of retained placenta.

Types of participants

All women having a vaginal delivery with a retained placenta. For this review we consider the trials including women in whom the placenta was not delivered spontaneously at least within 15 minutes of delivery of the baby.

Types of intervention

1. umbilical vein injection of saline solution versus expectant management;
2. umbilical vein injection of saline solution plus oxytocin versus expectant management;
3. umbilical vein injection of saline solution plus oxytocin versus umbilical vein injection of saline solution;
4. umbilical vein injection of saline solution plus oxytocin versus umbilical vein injection of plasma expander;
5. umbilical vein injection of saline solution plus prostaglandin versus umbilical vein injection of saline solution;
6. umbilical vein injection of saline solution plus prostaglandin versus umbilical vein injection of saline solution plus oxytocin.

Types of outcome measures

The following maternal outcomes were evaluated: manual removal of placenta, blood loss, haemoglobin, blood transfusion, curettage, infection, hospital stay, duration of third stage of labour, interval injection-delivery of the placenta, fever, abdominal pain, oxytocin augmentation.

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: methods used in reviews.

This review has drawn on the search strategy developed for the Cochrane Pregnancy and Childbirth Group as a whole. The full list of journals and conference proceedings as well as the search strategies for the electronic databases, which are searched by the Group on behalf of its reviewers, are described in detail in the 'Search strategies for the identification of studies section' within the editorial information about the Cochrane Pregnancy and Childbirth Group. Briefly, the Group searches on a regular basis MEDLINE, the Cochrane Controlled Trials Register and reviews the Contents tables of a further 38 relevant journals received via ZETOC, an electronic current awareness service. Date of last search: March 2001.

Relevant trials, which are identified through the Group's search strategy, are entered into the Group's Specialised Register of Controlled Trials. Please see Review Group's details for more detailed information.

METHODS OF THE REVIEW

Trials under consideration were evaluated for methodological quality and appropriateness for inclusion, without consideration of their results by the two authors. Included trial data were processed as described in Clarke 2000.

In summary, the scheme for assessing trials in this systematic review analysed methodological quality in three dimensions: the control for selection bias at entry (the quality of random allocation assessing the generation and concealment methods applied), the control of selection bias after entry (the extent to which the primary analysis included every person entered into the randomized cohorts) and the control of bias in assessing outcomes (the extent to which those assessing the outcomes were kept unaware of the group assignment of the individuals examined).

Data were extracted from each publication independently by the two authors and jointly reviewed before conducting the analyse without blinding of treatment, authors or results of trials.

DESCRIPTION OF STUDIES

For a detailed description of studies see table of 'Characteristics of included studies'. The following text summarises the principal characteristics.

Twelve trials (1045 women) were included in this review. Five trials were published in the late 1980s, six in the 1990s and one is still unpublished. Ten trials are small and two trials are relatively large. The largest trial includes 296 women.

Interventions
The agents and uterotonic drugs used in these trials include: saline solution alone, plasma expander alone, saline solution plus oxytocin and saline solution plus prostaglandin injected into the umbilical vein.

Saline solution alone versus expectant management was compared in four trials including 413 women. Saline solution plus oxytocin was compared to expectant management in five trials with 454 women. Saline solution plus oxytocin versus saline solution was compared in 10 trials including 649 women. Saline solution plus oxytocin versus plasma expander was compared in only one trial with 109 women. Saline solution plus prostaglandin versus saline solution was compared in only one small trial (17 women). There is only one trial with 21 women in the comparison saline solution plus prostaglandin versus saline solution plus oxytocin. The volume injected into the umbilical vein was mostly 20ml with only one trial using a lower dose (10ml) and one other trial using a higher dose (40ml). Most of the studies used 10IU of oxytocin except Wilken-Jensen 1989 (100IU), Makkonen 1995 (50IU), Bider 1996 (30IU), Gazvani 1998 and Carroli 1998 (20IU). The prostaglandin F2alpha dose used was 20mg. Plasma expander (Dextran 70) 20ml was administered.

Time to trial entry
The time to trial entry after delivery of the baby was 15 minutes in two trials, 20 minutes in four trials, 30 minutes in five trials and 60 minutes in one trial.

Limit time for manual removal of the placenta.
The limit time for manual removal of the placenta was 15 minutes in three trials, 30 minutes in four trials and 40-45 minutes in two trials. In one trial, timing of the procedure was left to the judgement of attending clinicians and in two trials it was not prespecified.

METHODOLOGICAL QUALITY

Selection bias at entry to the trial:
The Frappell 1988 trial and Carroli 1998 trial describe clearly the random method generation and concealment of allocation, making selection bias at entry to the trials unlikely. Also, in the Selinger 1986, Hansen 1987, Wilken-Jensen 1989 and Huber 1991 trials, concealment of allocation (coded by the pharmacist) was sound; the possibility of selection bias is unlikely but none of them describe the random generation method. The Calderale 1994 trial, although described as double blind and a placebo was administered, the allocation concealment is not clearly stated. The Gazvani 1998 trial describes clearly the random generation and the concealment of allocation by sealed envelopes. The Thiery unpublished trial only describes the concealment allocation method which is by sealed envelopes. Finally, the Kristiansen 1987, Makkonen 1995 and Bider 1996 trials did not describe the random generation or the allocation concealment method and, consequently, are open to selection bias at entry.

Selection bias after entry to the trial:
No withdrawals were stated to have occurred from the following trials: Selinger 1986, Kristiansen 1987, Hansen 1987, Calderale 1994, Makkonen 1995, Gazvani 1998 and Thiery unpublished, so the likelihood of selection bias after entry to these trials is low. In the Huber 1991 trial, 4.5% of the women were excluded from the analyses for violations of the treatment protocol and, in the Carroli 1998 trial, 1.7% of the participants were lost to follow-up, giving these two trials a very low risk of selection bias after entry. In the remaining trials, the withdrawals were as follows: Frappell 1988 18%, Wilken-Jensen 1989 7.5%, and Bider 1996 8%, without any explanation about the reason for the exclusions leaving open the potential for serious selection bias after entry into the trials.

Assessment bias:
The Selinger 1986 trial is potentially free of assessment bias because both arms of the trial were indistinguishable and also they did establish a time limit of 20 minutes for manual removal of the placenta although they described three women delivering the placenta spontaneously at 30, 55 and 80 minutes after entry to the trial.

The Kristiansen 1987 trial is prone to assessment bias because the physicians were aware of the treatment given and there was not an established limit time for manual removal of placenta.

The Hansen 1987 trial is likely to be free of assessment bias because the physicians were not aware of the treatment given to the women but they did not set a limit time for manual removal of the placenta.

The Frappell 1988 trial and the Wilken-Jensen 1989 trial are potentially free of assessment bias because, in both arms of the trials, the treatments given to the women were indistinguishable to the physician and also because they established a time limits of 15 minutes and 40 minutes respectively, for manual removal of placenta but they did not describe any method to control for protocol compliance .

The Huber 1991 trial is not prone to assessment bias in the comparison between the two injection arms of the trial but is prone to bias in the comparison to the expectant management arm because the treatment given was known by the physician and a limit

time for manual removal of the placenta was not established in the protocol; furthermore, timing was determined by the clinical judgement of the obstetrician.

The Calderale 1994 trial is not prone to assessment bias because both arms are indistinguishable and a limit time for manual removal of the placenta was established.

The Makkonen 1995 and Bider 1996 trials are likely to suffer assessment bias because they did not describe the masking procedure between both arms of the trial. In an effort to diminish the bias, a time limit of 40 minutes and 30 minutes, respectively, for manual removal of placenta was established, but they did not measure compliance with the protocol.

The Carroli 1998 trial is unlikely to suffer assessment bias between both injection arms of the trial because the physicians were not aware of the treatment given and a time limit of 30 minutes was established for manual removal the placenta; to assess compliance with the protocol, the time that had elapsed from entry to the trial to manual removal of the placenta was measured.

The Gazvani 1998 trial could suffer assessment bias because the observer was aware of the treatment given to each patient but a time limit for manual removal of the placenta was established to try to minimise the bias.

The Thiery unpublished trial is prone to assessment bias because the physicians were aware of the treatment given. To alleviate this problem a time limit of 15 minutes was set up for manual removal of the placenta but the researchers did not describe any effort to measure compliance with the protocol.

In summary, eight trials are methodologically sound (Calderale 1994; Selinger 1986; Hansen 1987; Frappell 1988; Wilken-Jensen 1989; Huber 1991; Carroli 1998; Gazvani 1998) and four trials are of poor methodological quality (Kristiansen 1987; Makkonen 1995; Bider 1996; Thiery unpublished).

RESULTS

In total, 12 trials were included.

SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Four trials were included in this comparison. Umbilical vein injection of saline solution compared with expectant management does not show any significant difference in manual removal of the placenta (relative risk (RR): 0.97; 95% confidence interval (CI): 0.83 to 1.14), blood loss, haemoglobin concentration, blood transfusion, curettage, infection and hospital stay.

SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Five trials were included in this comparison. Umbilical vein injection of saline solution plus oxytocin compared with expectant management shows a lower but not statistically significant difference in manual removal of the placenta (RR: 0.86; 95% CI: 0.72 to 1.01) and no difference in blood loss, haemoglobin, blood transfusion, curettage, infection and hospital stay.

SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Ten trials were included in this comparison. Umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of saline solution shows lower and statistically significant incidence of manual removal of placenta (RR: 0.79; 95% CI: 0.69 to 0.91).

The number needed to treat (NNT) and its 95% confidence intervals for this outcome was eight (five to 20). Differences were found in length of third stage of labour, blood loss, postpartum haemorrhage, haemoglobin, blood transfusion, curettage, infection, hospital stay, fever, abdominal pain and oxytocin augmentation.

SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER

Only one trial contributes to this comparison. Umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of plasma expander shows higher, but not statistically significant, incidence of manual removal of placenta (RR: 1.34; 95% CI: 0.97 to 1.85) and no difference in blood loss.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

There is only one small trial included in this comparison. Umbilical vein injection of saline solution plus prostaglandin compared with umbilical vein injection of saline solution shows a lower incidence of statistical significance in manual removal of placenta (RR: 0.05; 95% CI: 0.00 to 0.73) but no difference in blood loss, fever, abdominal pain, and oxytocin augmentation.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Again, there is only one small trial contributing to these results. Umbilical vein injection of saline solution plus prostaglandin versus umbilical vein injection of saline solution plus oxytocin does not show any significant difference in manual removal of placenta (RR: 0.10; 95% CI: 0.01 to 1.59), length of interval injection to delivery of placenta, blood loss, fever, abdominal pain and oxytocin augmentation.

DISCUSSION

SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

One question is whether umbilical vein injection of saline solution compared with expectant management reduces the need for manual removal of the placenta. The answer extracted from this systematic review of all available randomized controlled clinical trials

is that there seem to be no advantages in using this intervention to reduce the incidence of manual removal of the placenta. There was a similar lack of effect on secondary endpoints such as blood loss, blood transfusion curettage, hospital stay or any difference in postpartum haemoglobin level.

SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT
In this comparison, umbilical vein injection of saline solution plus oxytocin shows a 13% risk reduction in the incidence of manual removal of placenta, but this benefit is not statistically significant with confidence intervals compatible with a risk reduction of 27% and a marginal risk increment of 2%. There was no advantage in regard to secondary endpoints such as blood loss, haemoglobin, blood transfusion, curettage, infection and hospital stay.

SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION
Umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of saline solution shows a risk reduction in the incidence of manual removal of placenta of 12% and the 95% confidence intervals goes from a risk reduction of 19% to that of 5%. There results are consistent with the above comparison.

There is a clinically beneficial effect of umbilical vein injection of saline solution plus oxytocin for the management of retained placenta (NNT: 8; 95% CI: five to twenty). No difference was shown in length of third stage of labour, blood loss, postpartum haemorrhage, haemoglobin, blood transfusion, curettage, infection, hospital stay, fever, abdominal pain and oxytocin augmentation.

SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER
Umbilical vein injection of saline solution plus oxytocin compared with umbilical vein injection of plasma expander shows higher, but not statistically significant, incidence of manual removal of placenta and does not show any difference in blood loss but, as it is shown, there is only one trial available to date and considering the poor methodological quality and the small size of this trial, all the results should be interpreted cautiously.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION
The use of umbilical vein injection of saline solution plus prostaglandin compared with intra-umbilical vein injection of saline solution shows a statistically significant risk reduction in manual removal of placenta but does not show any difference in blood loss, fever, abdominal pain, and oxytocin augmentation. The results of this comparison should be viewed cautiously because there is only one small trial, with 17 women in total, in the comparison and, as can be seen in the data tables, the confidence intervals are wide.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN
The umbilical vein injection of saline solution plus prostaglandin compared with umbilical vein injection of saline solution plus oxytocin does not show any significant difference in manual removal of placenta, length of interval injection to delivery of placenta, blood loss, fever, abdominal pain and oxytocin augmentation. Again, in this comparison the results should be interpreted with care because there is only one small trial and the confidence intervals are wide to extract a reliable conclusion.

AUTHORS' CONCLUSIONS

Implications for practice

SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT
The available evidence extracted from the meta-analysis including four trials does not support the use of umbilical vein injection of saline solution alone for the management of retained placenta.

SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT
Although the effects of this treatment failed to reach statistical significance, there may be a clinically meaningful effect which could justify the use of saline solution plus oxytocin for the management of retained placenta.

SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION
There is evidence supporting the use of saline solution plus oxytocin for the management of retained placenta which is consistent with the results of the above comparison.

SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER
There is no strong evidence to support the use of umbilical vein injection of plasma expander.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION
There is no reliable evidence to support the use of umbilical vein injection of saline solution plus prostaglandin for retained placenta.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN
Again there is no reliable evidence giving support to the use of saline solution plus prostaglandin for retained placenta.

Implications for research

SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT
The evidence extracted from this review does not support further research on the use of umbilical vein injection of saline solution alone.

SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT
There is no evidence to support research on this comparison.

SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION
For those who are sceptical as to the conclusions of this meta-analysis, there is scope to perform a large randomised controlled trial with this comparison.

SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER
The available evidence leaves scope for further research on the use of umbilical vein injection of plasma expander compared to the more effective treatment to date which is saline solution plus oxytocin.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION
There is no need for further research on this comparison considering that any new treatment of umbilical vein injection should be compared to the one that have been shown to be effective, umbilical vein injection of saline solution plus oxytocin.

SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN
The available evidence shown there is some promising evidence of the effectiveness of saline solution plus prostaglandin compared to saline solution plus oxytocin for retained placenta warranting further research in this comparison.

POTENTIAL CONFLICT OF INTEREST

Guillermo Carroli and Eduardo Bergel are the authors of one of the trials included in this review.

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TABLES

Characteristics of included studies

Study	Bider 1996
Methods	Random generation: computerized. Allocation concealment: not stated.
Participants	34 women with singleton vaginal delivery with retained placenta 60 minutes after delivery of the baby.
Interventions	Group 1: UVI of prostaglandin F2 alpha 20mg + solution 20ml. Group 2: UVI of oxytocin 30 IU 3ml + solution 20ml. Group 3: UVI of saline solution 0.9% 20ml.
Outcomes	Manual removal of placenta 30 minutes after entry to the trial, expulsion time, blood loss, fever, abdominal pain, oxytocin augmentation.
Notes	
Allocation concealment	B – Unclear

Characteristics of included studies (*Continued*)

Study	**Calderale 1994**
Methods	Random generation: not stated. Allocation concealment: not stated. They said: "Randomised double blind".
Participants	42 women with vaginal delivery of a singleton fetus and 34-42 weeks of gestation. Retained placenta was diagnosed when it still undelivered 30 minutes after delivery of the baby .
Interventions	Group 1: UVI of oxytocin 10IU 1ml + saline solution 0.9% 20ml. Group 2: UVI of placebo.
Outcomes	Manual removal of the placenta 30 minutes after UVI.
Notes	
Allocation concealment	B – Unclear

Study	**Carroli 1998**
Methods	Random generation: customised computer program in a ratio of 1/1/1 within balanced blocks of 3-9, stratified by centre. Allocation concealment: Sealed treatment packs consecutively numbered. The packs were prepared by the statistician who kept the personnel involved in the recruitment unaware of the pack content. The packs were similar in size, shape, weight, and feel and were sealed with wax after preparation. Every treatment pack contained the same as the active treatment pack: one ampoule and a bottle but in the expectant management inside the lid and on the bottles was a label saying: 'do not use! expectant management'; furthermore, to be sure the fluid would not be injected, the bottles contained small black particles in the fluid.
Participants	296 women having no evidence of placental separation 30 minutes after a vaginal delivery and no uterine scar or hypovolaemic shock.
Interventions	Group 1: UVI of oxytocin 20 IU 2ml + saline solution 0.9% 18ml. Group 2: UVI of saline solution 0.9% 2ml + saline solution 0.9% 18 ml. Group 3: expectant management. After the first 64 women recruited the injected volume was increased to 40 ml.
Outcomes	Manual removal of placenta 30 minutes after entry to the trial, blood loss after entry to the trial, haemoglobin level at 24-48 hours and at 40-45 days after delivery, blood transfusion, curettage, infection and hospital stay.
Notes	
Allocation concealment	A – Adequate

Study	**Frappell 1988**
Methods	Random generation: random number table. Allocation concealment: sequentially randomly numbered ampoules prepared by pharmacist.
Participants	50 women with singleton vaginal delivery. Retained placenta was diagnosed by vaginal exam if the placenta was not located in the vagina or the cervix 15 minutes after the delivery of the baby.
Interventions	Group 1: UVI of 10 IU oxytocin 1ml + saline solution 0.9% 20ml. Group 2: UVI of placebo 2ml + saline solution 0.9% 20ml.
Outcomes	Manual removal of the placenta 15 minutes after the UVI.
Notes	
Allocation concealment	A – Adequate

Study	**Gazvani 1998**
Methods	Random generation: table of random numbers. Allocation concealment: consecutively numbered opaque, sealed envelopes were kept on the labour ward.

Characteristics of included studies (*Continued*)

Participants	81 women having placenta undelivered 20 minutes after completion of the second stage of labour and the following criteria: maternal age more than 18 years, gestational age equal or more than 28 weeks, no postpartum haemorrhage requiring immediate intervention, no known uterine malformations, no previous caesarean delivery.
Interventions	Intraumbilical vein injection was given 30 minutes after delivery of the baby. Group 1: UVI of 20 IU of oxytocin 2ml + 20ml of normal saline solution. Group 2: UVI of 20ml of normal saline solution. Group 3: no injection was given.
Outcomes	Manual removal of the placenta, expulsion of the placenta within 45 minutes, blood loss greater than 500ml.
Notes	
Allocation concealment	A – Adequate

Study	**Hansen 1987**
Methods	Random generation: not stated. Allocation concealment: identical consecutively numbered vials containing oxytocin or saline solution coded by pharmaceutical company that it was broken after completion of the trial.
Participants	60 women with retained placenta 30 minutes after delivery of the baby. One woman with heavy bleeding was not entered.
Interventions	Group 1: UVI of oxytocin 10 IU 1ml + saline solution 0.9% 20ml. Group 2: UVI of saline solution 0.9% 1ml + saline solution 0.9% 20ml.
Outcomes	Manual removal of placenta.
Notes	
Allocation concealment	A – Adequate

Study	**Huber 1991**
Methods	Random generation: not stated. Allocation concealment: identical white sealed boxes in numeric order that bore a serial code, by which randomization ocurred in three groups. Each box contained an unmarked ampoule. The code was kept by the principal investigator and was broken after completion of the trial.
Participants	220 women with a vaginal delivery of a singleton baby of equal or more than 28 weeks gestational age and placenta undelivered 30 minutes or more after delivery of the baby.
Interventions	Group 1: UVI of oxytocin 10 IU 1ml + saline solution 0.9% 20ml. Group 2: UVI of saline solution 0.9% 1ml + saline solution 0.9% 20ml. Group 3: Expectant management.
Outcomes	Manual removal of placenta after a time based on the clinical judgement of the obstetrician, time interval from injection to spontaneous expulsion of placenta, blood loss.
Notes	
Allocation concealment	A – Adequate

Study	**Kristiansen 1987**
Methods	Random generation: not stated. Allocation concealment: not stated. The authors said “randomized”.
Participants	51 women with retained placenta for more than 20 minutes after delivery of the baby.
Interventions	Group 1: UVI of oxytocin 10 IU 1ml + saline solution 0.9% 10ml. Group 2: UVI of saline solution 0.9% 10ml. Group 3: Expectant management.

Characteristics of included studies (*Continued*)

Outcomes	Manual removal of placenta.
Notes	
Allocation concealment	B – Unclear

Study	**Makkonen 1995**
Methods	Random generation: not stated. Allocation concealment: not stated.
Participants	109 women with retained placenta 30 minutes after delivery of the baby.
Interventions	Group 1: UVI of oxytocin 50 IU 5ml + saline solution 0.9% 15ml. Group 2: UVI of plasma expander (Dextran 70) 20ml.
Outcomes	Manual removal of the placenta 30 minutes after entry to the trial, duration of third stage, blood loss.
Notes	
Allocation concealment	B – Unclear

Study	**Selinger 1986**
Methods	Random generation: not stated. Allocation concealment: randomly numbered ampoules containing either 10 IU oxytocin or 1ml saline solution 0.9%.
Participants	30 women with vaginal delivery, singleton pregnancy and diagnosis of retained placenta by bimanual exam 20 minutes after delivery of the baby. Women shocked or heavily bleeding were excluded.
Interventions	Treatment group: UVI of saline solution 0.9% 19ml + oxytocin 10 IU (1ml). Control group: UVI of saline solution 0.9% 19ml + saline solution 0.9% 1ml.
Outcomes	Manual removal of placenta (15 minutes after injection), duration of third stage of labour, post-partum blood loss.
Notes	
Allocation concealment	A – Adequate

Study	**Thiery unpublished**
Methods	Random generation: not stated. Allocation concealment: sealed, numbered envelopes.
Participants	32 women with diagnosis of retained placenta 15 minutes after delivery of the baby.
Interventions	Group 1: UVI of oxytocin 10 IU 1ml + saline solution 0.9% 20ml. Group 2: expectant management.
Outcomes	Manual removal of placenta 15 minutes after entry to the trial.
Notes	
Allocation concealment	A – Adequate

Study	**Wilken-Jensen 1989**
Methods	Random generation: not stated. Allocation concealment: similar ampoules supplied by parmaceutical company.
Participants	40 women with diagnosis of retained placenta 20 minutes after delivery of the baby vaginally after by intermittent traction on the umbilical cord and light suprapubic pressure.
Interventions	Group 1: UVI of oxytocin 100 IU 10ml + saline solution 0.9% 20ml. Group 2: UVI of saline solution 0.9% 30ml.
Outcomes	Manual removal of placenta, time from injection to delivery of the placenta, post-partum blood loss.

Notes	
Allocation concealment	A – Adequate

IU = international unit
UVI = umbilical vein injection

ANALYSES

Comparison 01. SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Manual removal of the placenta	4	413	Relative Risk (Fixed) 95% CI	0.97 [0.83, 1.14]
02 Postpartum haemorrhage	1	55	Relative Risk (Fixed) 95% CI	0.37 [0.02, 8.71]
03 Blood loss = or > 500 ml after entry	1	122	Relative Risk (Fixed) 95% CI	1.04 [0.55, 1.96]
04 Blood loss = or > 1000 ml after entry	1	122	Relative Risk (Fixed) 95% CI	0.73 [0.17, 3.11]
05 Haemoglobin 24-48 hours postpartum	1	163	Weighted Mean Difference (Fixed) 95% CI	0.10 [-0.59, 0.79]
06 Haemoglobin 40-45 days postpartum	1	93	Weighted Mean Difference (Fixed) 95% CI	0.40 [-0.23, 1.03]
07 Blood transfusion	2	228	Relative Risk (Fixed) 95% CI	0.76 [0.41, 1.39]
08 Curettage	1	178	Relative Risk (Fixed) 95% CI	0.79 [0.51, 1.22]
09 Infection	1	176	Relative Risk (Fixed) 95% CI	0.48 [0.09, 2.54]
10 Stay at hospital more than two days	1	176	Relative Risk (Fixed) 95% CI	1.19 [0.66, 2.15]

Comparison 02. SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Manual removal of the placenta	5	454	Relative Risk (Fixed) 95% CI	0.86 [0.72, 1.01]
02 Postpartum haemorrhage	1	55	Relative Risk (Fixed) 95% CI	1.12 [0.07, 16.95]
03 Blood loss = or > 500 ml after entry	1	130	Relative Risk (Fixed) 95% CI	1.53 [0.88, 2.67]
04 Blood loss = or > 1000 ml after entry	1	130	Relative Risk (Fixed) 95% CI	1.29 [0.38, 4.34]
05 Haemoglobin 24-48 hours postpartum	1	164	Weighted Mean Difference (Fixed) 95% CI	0.00 [-0.61, 0.61]
06 Haemoglobin 40-45 days postpartum	1	96	Weighted Mean Difference (Fixed) 95% CI	0.50 [-0.14, 1.14]
07 Blood transfusion	2	237	Relative Risk (Fixed) 95% CI	0.89 [0.50, 1.58]
08 Curettage	1	182	Relative Risk (Fixed) 95% CI	0.69 [0.44, 1.09]
09 Infection	1	179	Relative Risk (Fixed) 95% CI	1.16 [0.32, 4.16]
10 Stay at hospital more than two days	1	180	Relative Risk (Fixed) 95% CI	1.09 [0.60, 1.97]

Comparison 03. SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Manual removal of the placenta	10	649	Relative Risk (Fixed) 95% CI	0.79 [0.69, 0.91]
02 Length of third stage of labour	1	30	Weighted Mean Difference (Fixed) 95% CI	16.20 [-15.22, 47.62]
03 Blood loss	2	48	Weighted Mean Difference (Fixed) 95% CI	21.60 [-49.73, 92.94]
04 Postpartum haemorrhage	1	52	Relative Risk (Fixed) 95% CI	3.00 [0.13, 70.42]
05 Blood loss = or > 500 ml after entry	1	130	Relative Risk (Fixed) 95% CI	1.43 [0.83, 2.45]
06 Blood loss = or > 1000 ml after entry	1	130	Relative Risk (Fixed) 95% CI	1.71 [0.45, 6.56]
07 Haemoglobin 24-48 hours pospartum	1	167	Weighted Mean Difference (Fixed) 95% CI	-0.10 [-0.76, 0.56]
08 Haemoglobin 40-45 days postpartum	1	91	Weighted Mean Difference (Fixed) 95% CI	0.10 [-0.58, 0.78]
09 Blood transfusion	2	238	Relative Risk (Fixed) 95% CI	1.17 [0.63, 2.19]
10 Curettage	1	184	Relative Risk (Fixed) 95% CI	0.88 [0.54, 1.43]
11 Infection	1	183	Relative Risk (Fixed) 95% CI	2.42 [0.48, 12.15]
12 Stay at hospital more than two days	1	184	Relative Risk (Fixed) 95% CI	0.91 [0.52, 1.59]
13 Fever	1	18	Relative Risk (Fixed) 95% CI	2.00 [0.09, 43.22]
14 Abdominal pain	1	18	Relative Risk (Fixed) 95% CI	2.00 [0.09, 43.22]
15 Oxytocin augmentation	1	22	Relative Risk (Fixed) 95% CI	1.25 [0.45, 3.45]

Comparison 04. SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Manual removal of the placenta	1	109	Relative Risk (Fixed) 95% CI	1.34 [0.97, 1.85]
02 Blood loss > 500 ml	1	109	Relative Risk (Fixed) 95% CI	0.88 [0.52, 1.50]
03 Blood loss > 1000 ml	1	109	Relative Risk (Fixed) 95% CI	0.96 [0.34, 2.75]

Comparison 05. SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Manual removal of the placenta	1	17	Relative Risk (Fixed) 95% CI	0.05 [0.00, 0.73]
02 Blood loss	1	17	Weighted Mean Difference (Fixed) 95% CI	-21.00 [-120.18, 78.18]
03 Fever	1	17	Relative Risk (Fixed) 95% CI	2.18 [0.10, 46.92]
04 Abdominal pain	1	17	Relative Risk (Fixed) 95% CI	5.09 [0.30, 85.39]
05 Oxytocin augmentation	1	17	Relative Risk (Fixed) 95% CI	1.05 [0.46, 2.38]

Comparison 06. SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Manual removal of the placenta	1	21	Relative Risk (Fixed) 95% CI	0.10 [0.01, 1.59]
02 Length of interval injection-delivery of the placenta	1	21	Weighted Mean Difference (Fixed) 95% CI	-6.00 [-8.78, -3.22]
03 Blood loss	1	21	Weighted Mean Difference (Fixed) 95% CI	-19.00 [-118.19, 80.19]
04 Fever	1	21	Relative Risk (Fixed) 95% CI	1.10 [0.08, 15.36]
05 Abdominal pain	1	21	Relative Risk (Fixed) 95% CI	3.30 [0.41, 26.81]
06 Oxytocin augmentation	1	21	Relative Risk (Fixed) 95% CI	1.32 [0.58, 3.00]

INDEX TERMS

Medical Subject Headings (MeSH)

Injections, Intravenous; Oxytocin [*administration & dosage]; Placenta, Retained [*therapy]; Umbilical Veins

MeSH check words

Female; Humans; Pregnancy

COVER SHEET

Title	Umbilical vein injection for management of retained placenta
Authors	Carroli G, Bergel E
Contribution of author(s)	G Carroli was responsible for the idea, conception and preparation of the review. He and E Bergel reviewed the quality of the trials, extracted the data and wrote the paper.
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Date new studies found but not yet included/excluded	Information not supplied by author
Date new studies found and included/excluded	Information not supplied by author
Date authors' conclusions section amended	Information not supplied by author
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GRAPHS AND OTHER TABLES

Analysis 01.01. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 01 Manual removal of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 01 Manual removal of the placenta

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	60/95	59/93		50.4	1.00 [0.80, 1.24]
Gazvani 1998	22/26	26/29		20.8	0.94 [0.77, 1.16]
Huber 1991	25/69	25/69		21.1	1.00 [0.64, 1.56]
Kristiansen 1987	7/16	9/16		7.6	0.78 [0.38, 1.57]
Total (95% CI)	206	207		100.0	0.97 [0.83, 1.14]

Total events: 114 (Treatment), 119 (Control)

Test for heterogeneity chi-square=0.52 df=3 p=0.92 I^2 =0.0%

Test for overall effect z=0.38 p=0.7

Analysis 01.02. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 02 Postpartum haemorrhage

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 02 Postpartum haemorrhage

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Gazvani 1998	0/26	1/29		100.0	0.37 [0.02, 8.71]
Total (95% CI)	26	29		100.0	0.37 [0.02, 8.71]
Total events: 0 (Treatment), 1 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.62 p=0.5					

Analysis 01.03. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 03 Blood loss = or > 500 ml after entry

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 03 Blood loss = or > 500 ml after entry

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	15/62	14/60		100.0	1.04 [0.55, 1.96]
Total (95% CI)	62	60		100.0	1.04 [0.55, 1.96]
Total events: 15 (Treatment), 14 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.11 p=0.9					

Analysis 01.04. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 04 Blood loss = or > 1000 ml after entry

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 04 Blood loss = or > 1000 ml after entry

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	3/62	4/60		100.0	0.73 [0.17, 3.11]
Total (95% CI)	62	60		100.0	0.73 [0.17, 3.11]
Total events: 3 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.43 p=0.7					

Analysis 01.05. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 05 Haemoglobin 24-48 hours postpartum

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 05 Haemoglobin 24-48 hours postpartum

Study	Treatment N	Mean(SD)	Control N	Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Carroli 1998	82	9.80 (2.40)	81	9.70 (2.10)		100.0	0.10 [-0.59, 0.79]
Total (95% CI)	82		81			100.0	0.10 [-0.59, 0.79]
Test for heterogeneity: not applicable							
Test for overall effect z=0.28 p=0.8							

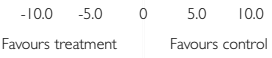
Analysis 01.06. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 06 Haemoglobin 40-45 days postpartum

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 06 Haemoglobin 40-45 days postpartum

Study	Treatment N	Treatment Mean(SD)	Control N	Control Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Carroli 1998	44	10.80 (1.60)	49	10.40 (1.50)		100.0	0.40 [-0.23, 1.03]
Total (95% CI)	44		49			100.0	0.40 [-0.23, 1.03]
Test for heterogeneity: not applicable							
Test for overall effect z=1.24 p=0.2							



Analysis 01.07. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 07 Blood transfusion

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 07 Blood transfusion

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	15/92	19/88		100.0	0.76 [0.41, 1.39]
× Gazvani 1998	0/26	0/22		0.0	Not estimable
Total (95% CI)	118	110		100.0	0.76 [0.41, 1.39]
Total events: 15 (Treatment), 19 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.90 p=0.4					

Analysis 01.08. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 08 Curettage

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 08 Curettage

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	25/90	31/88		100.0	0.79 [0.51, 1.22]
Total (95% CI)	90	88		100.0	0.79 [0.51, 1.22]
Total events: 25 (Treatment), 31 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.06 p=0.3					

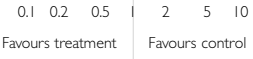
Analysis 01.09. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 09 Infection

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 09 Infection

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	2/90	4/86		100.0	0.48 [0.09, 2.54]
Total (95% CI)	90	86		100.0	0.48 [0.09, 2.54]
Total events: 2 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.87 p=0.4					



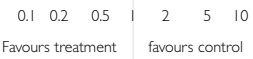
Analysis 01.10. Comparison 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT, Outcome 10 Stay at hospital more than two days

Review: Umbilical vein injection for management of retained placenta

Comparison: 01 SALINE SOLUTION VERSUS EXPECTANT MANAGEMENT

Outcome: 10 Stay at hospital more than two days

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	20/90	16/86		100.0	1.19 [0.66, 2.15]
Total (95% CI)	90	86		100.0	1.19 [0.66, 2.15]
Total events: 20 (Treatment), 16 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.59 p=0.6					



Analysis 02.01. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 01 Manual removal of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 01 Manual removal of the placenta

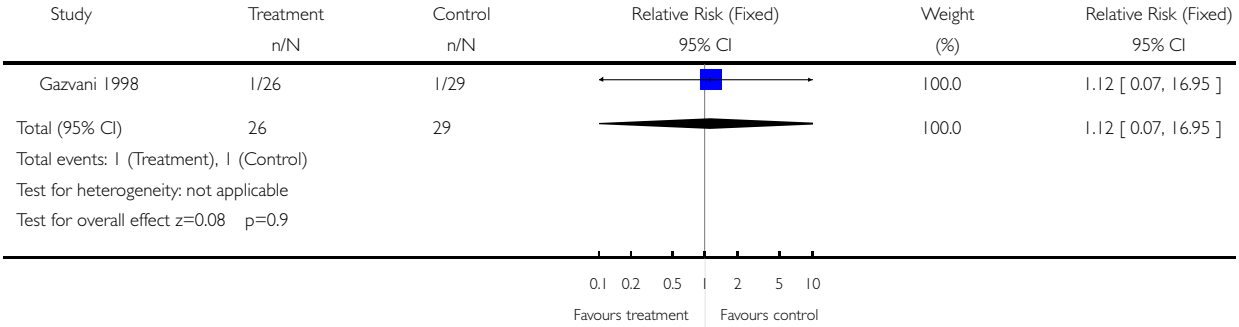
Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	57/98	59/93		45.8	0.92 [0.73, 1.15]
Gazvani 1998	14/26	26/29		18.6	0.60 [0.41, 0.88]
Huber 1991	27/72	25/69		19.3	1.04 [0.67, 1.59]
Kristiansen 1987	10/19	9/16		7.4	0.94 [0.51, 1.72]
Thiery unpublished	9/19	10/13		9.0	0.62 [0.35, 1.08]
Total (95% CI)	234	220		100.0	0.86 [0.72, 1.01]
Total events: 117 (Treatment), 129 (Control)					
Test for heterogeneity chi-square=5.89 df=4 p=0.21 I^2 =32.1%					
Test for overall effect z=1.85 p=0.06					

Analysis 02.02. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 02 Postpartum haemorrhage

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 02 Postpartum haemorrhage

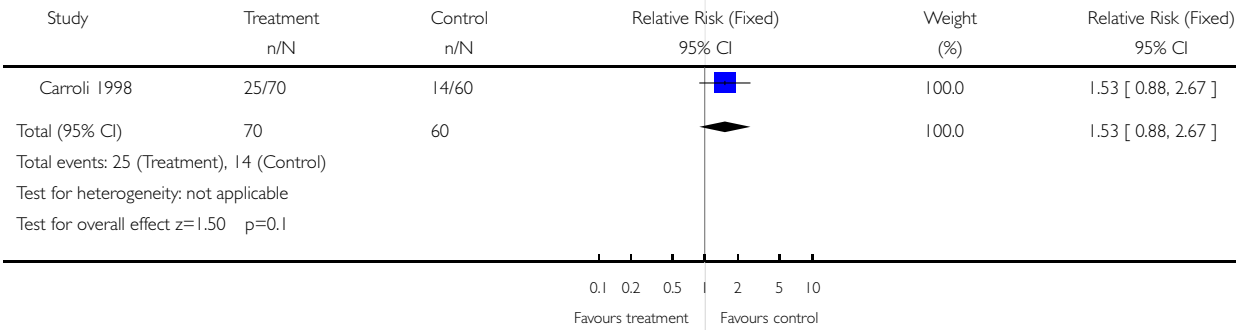


Analysis 02.03. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 03 Blood loss = or > 500 ml after entry

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 03 Blood loss = or > 500 ml after entry



Analysis 02.04. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 04 Blood loss = or > 1000 ml after entry

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 04 Blood loss = or > 1000 ml after entry

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	6/70	4/60		100.0	1.29 [0.38, 4.34]
Total (95% CI)	70	60		100.0	1.29 [0.38, 4.34]
Total events: 6 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.40 p=0.7					

Analysis 02.05. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 05 Haemoglobin 24-48 hours postpartum

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 05 Haemoglobin 24-48 hours postpartum

Study	Treatment N	Mean(SD)	Control N	Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Carroli 1998	85	9.70 (1.90)	79	9.70 (2.10)		100.0	0.00 [-0.61, 0.61]
Total (95% CI)	85		79			100.0	0.00 [-0.61, 0.61]
Test for heterogeneity: not applicable							
Test for overall effect z=0.00 p=1							

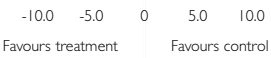
Analysis 02.06. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 06 Haemoglobin 40-45 days postpartum

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 06 Haemoglobin 40-45 days postpartum

Study	Treatment		Control		Weighted Mean Difference (Fixed)	Weight	Weighted Mean Difference (Fixed)
	N	Mean(SD)	N	Mean(SD)	95% CI	(%)	95% CI
Carroli 1998	47	10.90 (1.70)	49	10.40 (1.50)		100.0	0.50 [-0.14, 1.14]
Total (95% CI)	47		49			100.0	0.50 [-0.14, 1.14]
Test for heterogeneity: not applicable							
Test for overall effect z=1.53 p=0.1							



Analysis 02.07. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 07 Blood transfusion

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 07 Blood transfusion

Study	Treatment	Control	Relative Risk (Fixed)	Weight	Relative Risk (Fixed)
	n/N	n/N	95% CI	(%)	95% CI
Carroli 1998	18/94	19/88		100.0	0.89 [0.50, 1.58]
× Gazvani 1998	0/26	0/29		0.0	Not estimable
Total (95% CI)	120	117		100.0	0.89 [0.50, 1.58]
Total events: 18 (Treatment), 19 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.41 p=0.7					

Analysis 02.08. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 08 Curettage

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 08 Curettage

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	23/94	31/88		100.0	0.69 [0.44, 1.09]
Total (95% CI)	94	88		100.0	0.69 [0.44, 1.09]
Total events: 23 (Treatment), 31 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.57 p=0.1					

Analysis 02.09. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 09 Infection

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 09 Infection

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	5/93	4/86		100.0	1.16 [0.32, 4.16]
Total (95% CI)	93	86		100.0	1.16 [0.32, 4.16]
Total events: 5 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.22 p=0.8					

Analysis 02.10. Comparison 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT, Outcome 10 Stay at hospital more than two days

Review: Umbilical vein injection for management of retained placenta

Comparison: 02 SALINE SOLUTION PLUS OXYTOCIN VERSUS EXPECTANT MANAGEMENT

Outcome: 10 Stay at hospital more than two days

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	19/94	16/86		100.0	1.09 [0.60, 1.97]
Total (95% CI)	94	86		100.0	1.09 [0.60, 1.97]
Total events: 19 (Treatment), 16 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.27 p=0.8					

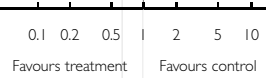
Analysis 03.01. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 01 Manual removal of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 01 Manual removal of the placenta

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	5/11	7/7		4.5	0.45 [0.24, 0.87]
Calderale 1994	1/22	9/20		5.0	0.10 [0.01, 0.73]
Carroli 1998	57/98	60/95		32.0	0.92 [0.73, 1.16]
Frappell 1988	14/22	15/19		8.5	0.81 [0.54, 1.19]
Gazvani 1998	14/26	22/26		11.6	0.64 [0.43, 0.94]
Hansen 1987	14/32	20/28		11.2	0.61 [0.39, 0.97]
Huber 1991	27/72	25/69		13.4	1.04 [0.67, 1.59]
Kristiansen 1987	10/19	7/16		4.0	1.20 [0.60, 2.42]
Selinger 1986	9/15	8/15		4.2	1.13 [0.60, 2.11]
Wilken-Jensen 1989	5/18	11/19		5.6	0.48 [0.21, 1.11]
Total (95% CI)	335	314		100.0	0.79 [0.69, 0.91]
Total events: 156 (Treatment), 184 (Control)					
Test for heterogeneity chi-square=16.52 df=9 p=0.06 I^2 =45.5%					
Test for overall effect z=3.18 p=0.001					



Analysis 03.02. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 02 Length of third stage of labour

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 02 Length of third stage of labour

Study	Treatment		Control		Weighted Mean Difference (Fixed)	Weight	Weighted Mean Difference (Fixed)
	N	Mean(SD)	N	Mean(SD)	95% CI	(%)	95% CI
Selinger 1986	15	111.40 (43.20)	15	95.20 (44.60)		100.0	16.20 [-15.22, 47.62]
Total (95% CI)	15		15			100.0	16.20 [-15.22, 47.62]
Test for heterogeneity: not applicable							
Test for overall effect z=1.01 p=0.3							

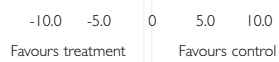
Analysis 03.03. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 03 Blood loss

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 03 Blood loss

Study	Treatment		Control		Weighted Mean Difference (Fixed)	Weight	Weighted Mean Difference (Fixed)
	N	Mean(SD)	N	Mean(SD)	95% CI	(%)	95% CI
Bider 1996	11	229.00 (102.80)	7	231.00 (82.00)		68.9	-2.00 [-87.91, 83.91]
Selinger 1986	15	360.00 (221.00)	15	286.00 (123.00)		31.1	74.00 [-53.99, 201.99]
Total (95% CI)	26		22			100.0	21.60 [-49.73, 92.94]
Test for heterogeneity chi-square=0.93 df=1 p=0.33 I^2 =0.0%							
Test for overall effect z=0.59 p=0.6							



Analysis 03.04. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 04 Postpartum haemorrhage

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 04 Postpartum haemorrhage

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Gazvani 1998	1/26	0/26		100.0	3.00 [0.13, 70.42]
Total (95% CI)	26	26		100.0	3.00 [0.13, 70.42]
Total events: 1 (Treatment), 0 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.68 p=0.5					

Analysis 03.05. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 05 Blood loss = or > 500 ml after entry

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 05 Blood loss = or > 500 ml after entry

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	25/70	15/60		100.0	1.43 [0.83, 2.45]
Total (95% CI)	70	60		100.0	1.43 [0.83, 2.45]
Total events: 25 (Treatment), 15 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.30 p=0.2					

Analysis 03.06. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 06 Blood loss = or > 1000 ml after entry

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 06 Blood loss = or > 1000 ml after entry

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	6/70	3/60		100.0	1.71 [0.45, 6.56]
Total (95% CI)	70	60		100.0	1.71 [0.45, 6.56]
Total events: 6 (Treatment), 3 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.79 p=0.4					

Analysis 03.07. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 07 Haemoglobin 24-48 hours pospartum

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 07 Haemoglobin 24-48 hours pospartum

Study	Treatment N	Mean(SD)	Control N	Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Carroli 1998	85	9.70 (1.90)	82	9.80 (2.40)		100.0	-0.10 [-0.76, 0.56]
Total (95% CI)	85		82			100.0	-0.10 [-0.76, 0.56]
Test for heterogeneity: not applicable							
Test for overall effect z=0.30 p=0.8							

Analysis 03.08. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 08 Haemoglobin 40-45 days postpartum

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 08 Haemoglobin 40-45 days postpartum

Study	Treatment N	Treatment Mean(SD)	Control N	Control Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Carroli 1998	47	10.90 (1.70)	44	10.80 (1.60)		100.0	0.10 [-0.58, 0.78]
Total (95% CI)	47		44			100.0	0.10 [-0.58, 0.78]
Test for heterogeneity: not applicable							
Test for overall effect z=0.29 p=0.8							

Analysis 03.09. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 09 Blood transfusion

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 09 Blood transfusion

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	18/94	15/92		100.0	1.17 [0.63, 2.19]
× Gazvani 1998	0/26	0/26		0.0	Not estimable
Total (95% CI)	120	118		100.0	1.17 [0.63, 2.19]
Total events: 18 (Treatment), 15 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.51 p=0.6					

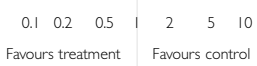
Analysis 03.10. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 10 Curettage

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 10 Curettage

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	23/94	25/90		100.0	0.88 [0.54, 1.43]
Total (95% CI)	94	90		100.0	0.88 [0.54, 1.43]
Total events: 23 (Treatment), 25 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.51 p=0.6					



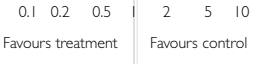
Analysis 03.11. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 11 Infection

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 11 Infection

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	5/93	2/90		100.0	2.42 [0.48, 12.15]
Total (95% CI)	93	90		100.0	2.42 [0.48, 12.15]
Total events: 5 (Treatment), 2 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.07 p=0.3					



Analysis 03.12. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 12 Stay at hospital more than two days

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 12 Stay at hospital more than two days

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Carroli 1998	19/94	20/90		100.0	0.91 [0.52, 1.59]
Total (95% CI)	94	90		100.0	0.91 [0.52, 1.59]
Total events: 19 (Treatment), 20 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.33 p=0.7					

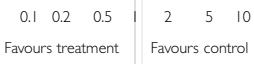
Analysis 03.13. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 13 Fever

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 13 Fever

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	1/11	0/7		100.0	2.00 [0.09, 43.22]
Total (95% CI)	11	7		100.0	2.00 [0.09, 43.22]
Total events: 1 (Treatment), 0 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.44 p=0.7					



Analysis 03.14. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 14 Abdominal pain

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 14 Abdominal pain

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	1/11	0/7		100.0	2.00 [0.09, 43.22]
Total (95% CI)	11	7		100.0	2.00 [0.09, 43.22]
Total events: 1 (Treatment), 0 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.44 p=0.7					

Analysis 03.15. Comparison 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION, Outcome 15 Oxytocin augmentation

Review: Umbilical vein injection for management of retained placenta

Comparison: 03 SALINE SOLUTION PLUS OXYTOCIN VERSUS SALINE SOLUTION

Outcome: 15 Oxytocin augmentation

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	5/11	4/11		100.0	1.25 [0.45, 3.45]
Total (95% CI)	11	11		100.0	1.25 [0.45, 3.45]
Total events: 5 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.43 p=0.7					

Analysis 04.01. Comparison 04 SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER, Outcome 01 Manual removal of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 04 SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER

Outcome: 01 Manual removal of the placenta

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Makkonen 1995	49/68	22/41		100.0	1.34 [0.97, 1.85]
Total (95% CI)	68	41		100.0	1.34 [0.97, 1.85]
Total events: 49 (Treatment), 22 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.80 p=0.07					

Analysis 04.02. Comparison 04 SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER, Outcome 02 Blood loss > 500 ml

Review: Umbilical vein injection for management of retained placenta

Comparison: 04 SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER

Outcome: 02 Blood loss > 500 ml

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Makkonen 1995	22/68	15/41		100.0	0.88 [0.52, 1.50]
Total (95% CI)	68	41		100.0	0.88 [0.52, 1.50]
Total events: 22 (Treatment), 15 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.45 p=0.6					

Analysis 04.03. Comparison 04 SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER, Outcome 03 Blood loss > 1000 ml

Review: Umbilical vein injection for management of retained placenta

Comparison: 04 SALINE SOLUTION PLUS OXYTOCIN VERSUS PLASMA EXPANDER

Outcome: 03 Blood loss > 1000 ml

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Makkonen 1995	8/68	5/41		100.0	0.96 [0.34, 2.75]
Total (95% CI)	68	41		100.0	0.96 [0.34, 2.75]
Total events: 8 (Treatment), 5 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.07 p=0.9					

Analysis 05.01. Comparison 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION, Outcome 01 Manual removal of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

Outcome: 01 Manual removal of the placenta

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	0/10	7/7		100.0	0.05 [0.00, 0.73]
Total (95% CI)	10	7		100.0	0.05 [0.00, 0.73]
Total events: 0 (Treatment), 7 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=2.19 p=0.03					

Analysis 05.02. Comparison 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION, Outcome 02 Blood loss

Review: Umbilical vein injection for management of retained placenta

Comparison: 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

Outcome: 02 Blood loss

Study	Treatment N	Treatment Mean(SD)	Control N	Control Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Bider 1996	10	210.00 (126.50)	7	231.00 (82.00)		100.0	-21.00 [-120.18, 78.18]
Total (95% CI)	10		7			100.0	-21.00 [-120.18, 78.18]
Test for heterogeneity: not applicable							
Test for overall effect z=0.41 p=0.7							

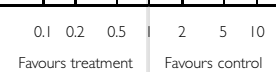
Analysis 05.03. Comparison 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION, Outcome 03 Fever

Review: Umbilical vein injection for management of retained placenta

Comparison: 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

Outcome: 03 Fever

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	1/10	0/7		100.0	2.18 [0.10, 46.92]
Total (95% CI)	10	7		100.0	2.18 [0.10, 46.92]
Total events: 1 (Treatment), 0 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.50 p=0.6					



Analysis 05.04. Comparison 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION, Outcome 04 Abdominal pain

Review: Umbilical vein injection for management of retained placenta

Comparison: 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

Outcome: 04 Abdominal pain

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	3/10	0/7		100.0	5.09 [0.30, 85.39]
Total (95% CI)	10	7		100.0	5.09 [0.30, 85.39]
Total events: 3 (Treatment), 0 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.13 p=0.3					

Analysis 05.05. Comparison 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION, Outcome 05 Oxytocin augmentation

Review: Umbilical vein injection for management of retained placenta

Comparison: 05 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION

Outcome: 05 Oxytocin augmentation

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	6/10	4/7		100.0	1.05 [0.46, 2.38]
Total (95% CI)	10	7		100.0	1.05 [0.46, 2.38]
Total events: 6 (Treatment), 4 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.12 p=0.9					

Analysis 06.01. Comparison 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN, Outcome 01 Manual removal of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome: 01 Manual removal of the placenta

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	0/10	5/11		100.0	0.10 [0.01, 1.59]
Total (95% CI)	10	11		100.0	0.10 [0.01, 1.59]
Total events: 0 (Treatment), 5 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.63 p=0.1					

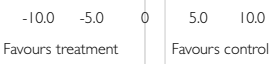
Analysis 06.02. Comparison 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN, Outcome 02 Length of interval injection-delivery of the placenta

Review: Umbilical vein injection for management of retained placenta

Comparison: 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome: 02 Length of interval injection-delivery of the placenta

Study	Treatment N	Mean(SD)	Control N	Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Bider 1996	10	7.00 (3.20)	11	13.00 (3.30)		100.0	-6.00 [-8.78, -3.22]
Total (95% CI)	10		11			100.0	-6.00 [-8.78, -3.22]
Test for heterogeneity: not applicable							
Test for overall effect z=4.23 p=0.00002							



Analysis 06.03. Comparison 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN, Outcome 03 Blood loss

Review: Umbilical vein injection for management of retained placenta

Comparison: 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome: 03 Blood loss

Study	Treatment N	Treatment Mean(SD)	Control N	Control Mean(SD)	Weighted Mean Difference (Fixed) 95% CI	Weight (%)	Weighted Mean Difference (Fixed) 95% CI
Bider 1996	10	210.00 (126.50)	11	229.00 (102.80)		100.0	-19.00 [-118.19, 80.19]
Total (95% CI)	10		11			100.0	-19.00 [-118.19, 80.19]
Test for heterogeneity: not applicable							
Test for overall effect z=0.38 p=0.7							

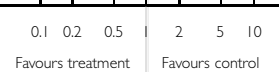
Analysis 06.04. Comparison 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN, Outcome 04 Fever

Review: Umbilical vein injection for management of retained placenta

Comparison: 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome: 04 Fever

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	1/10	1/11		100.0	1.10 [0.08, 15.36]
Total (95% CI)	10	11		100.0	1.10 [0.08, 15.36]
Total events: 1 (Treatment), 1 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.07 p=0.9					



Analysis 06.05. Comparison 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN, Outcome 05 Abdominal pain

Review: Umbilical vein injection for management of retained placenta

Comparison: 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome: 05 Abdominal pain

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	3/10	1/11		100.0	3.30 [0.41, 26.81]
Total (95% CI)	10	11		100.0	3.30 [0.41, 26.81]
Total events: 3 (Treatment), 1 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=1.12 p=0.3					

Analysis 06.06. Comparison 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN, Outcome 06 Oxytocin augmentation

Review: Umbilical vein injection for management of retained placenta

Comparison: 06 SALINE SOLUTION PLUS PROSTAGLANDIN VERSUS SALINE SOLUTION PLUS OXYTOCIN

Outcome: 06 Oxytocin augmentation

Study	Treatment n/N	Control n/N	Relative Risk (Fixed) 95% CI	Weight (%)	Relative Risk (Fixed) 95% CI
Bider 1996	6/10	5/11		100.0	1.32 [0.58, 3.00]
Total (95% CI)	10	11		100.0	1.32 [0.58, 3.00]
Total events: 6 (Treatment), 5 (Control)					
Test for heterogeneity: not applicable					
Test for overall effect z=0.66 p=0.5