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**Cochrane Clinical Answers****Question:****How does epidural analgesia compare with opioids for pain management during labor?**

Sera Tort, Agustín Ciapponi

<https://doi.org/10.1002/cca.2198> | 23 October 2018

Answer

When reviewers compare epidural analgesia with opioids for pain management in labor (primiparous or multiparous women in spontaneous labor with no complications), low-certainty evidence suggests a significant reduction in pain during labor, greater satisfaction with pain relief (1000 vs 684 per 1000 women; all results on average), and higher rates of assisted vaginal birth (113 vs 79 per 1000 women) with epidural analgesia. Moderate-certainty evidence shows similar rates of cesarean section and admission to the neonatal intensive care unit in both groups. As for adverse effects, hypotension, motor blockade, fever, and urinary retention were more common in women receiving an epidural, whereas respiratory depression requiring oxygen administration, nausea and vomiting, and neonatal acidosis and naloxone administration were more frequent in those given opioids; most trials reported low event rates in both groups.

Comparisons

1. Epidural versus opioids

[Expand All »](#)

> OUTCOME 1.1 Pain score in labor

Narrative result

Five RCTs with 1133 women found that pain scores in labor were lower (better) with epidural than with opioid analgesia.

The reviewers calculated a standardized mean difference. These are hard to interpret clinically but rules of thumb in their interpretation suggest that 0.2 represents a small effect, 0.5 a moderate effect, and 0.8 a large effect (Cohen J. Statistical Power Analysis in the Behavioral Sciences (2nd edition). Hillsdale (NJ): Lawrence Erlbaum Associates, Inc., 1988).[1]

Quality of the evidence

The reviewers performed a GRADE assessment of the quality of evidence for this outcome at this time point and stated that the evidence was low certainty. See [Summary of findings from Cochrane Review](#)

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (standardized mean difference - 2.64, 95% CI -4.56 to -0.73).

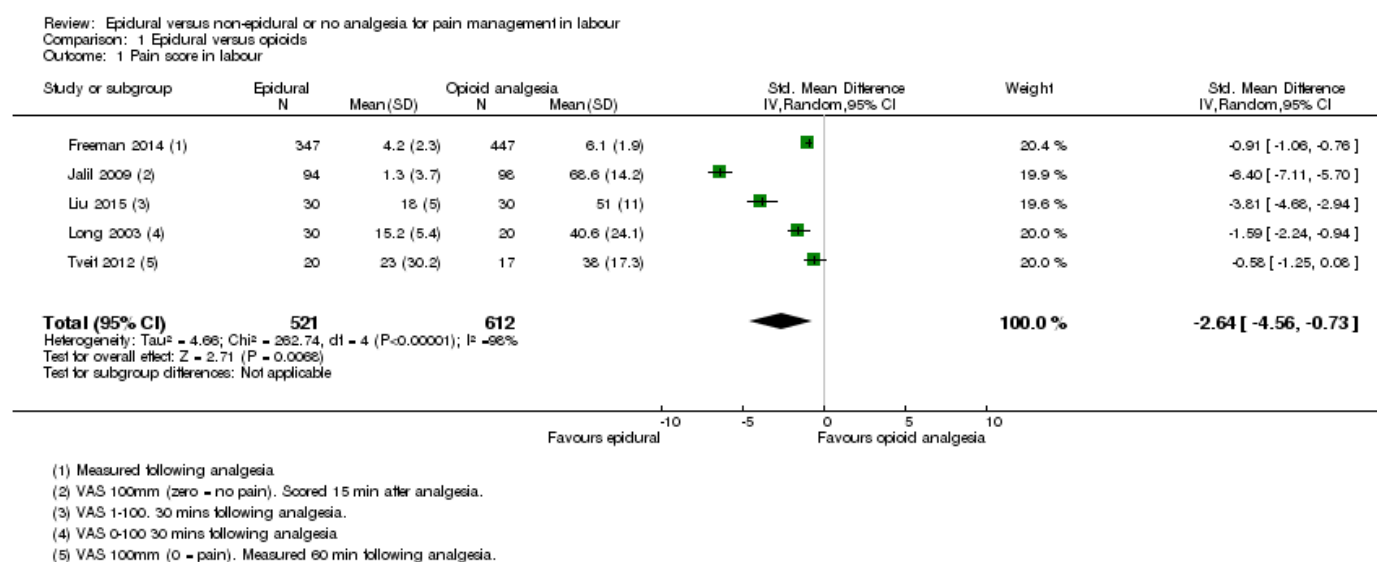


Figure 1

Forest plot from Cochrane Review

[Open in figure viewer](#)

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

➤ **OUTCOME 1.2 Satisfaction with pain relief in labor - proportion rating excellent or very good**

Narrative result

Seven RCTs with 1911 participants found that more women rated pain relief as excellent or very good with epidural than with opioid analgesia.[2]

Quality of the evidence

The reviewers performed a GRADE assessment of the quality of evidence for this outcome at this time point and stated that the evidence was low certainty. See [Summary of findings from Cochrane Review](#)

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (RR 1.47, 95% CI 1.03 to 2.08).

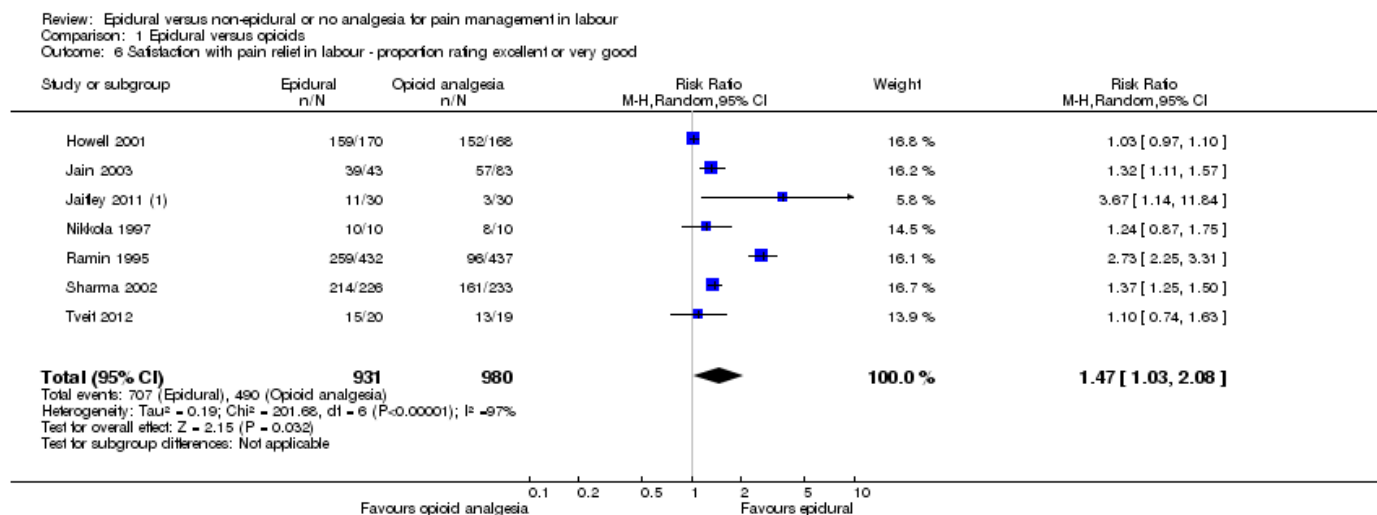


Figure 2

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

1000 per 1000 women (95% CI 707 to 1000) with epidural compared with 684 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

OUTCOME 1.3 Perceived feeling of poor control in labor

Narrative result

One RCT with 344 participants found no statistically significant difference between groups.[3]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. The study reported adequate allocation concealment and/or random sequence generation but was not blinded and did not report results from all randomized participants.

Relative effect or mean difference

There was no statistically significant difference between groups (RR 1.17, 95% CI 0.62 to 2.21).

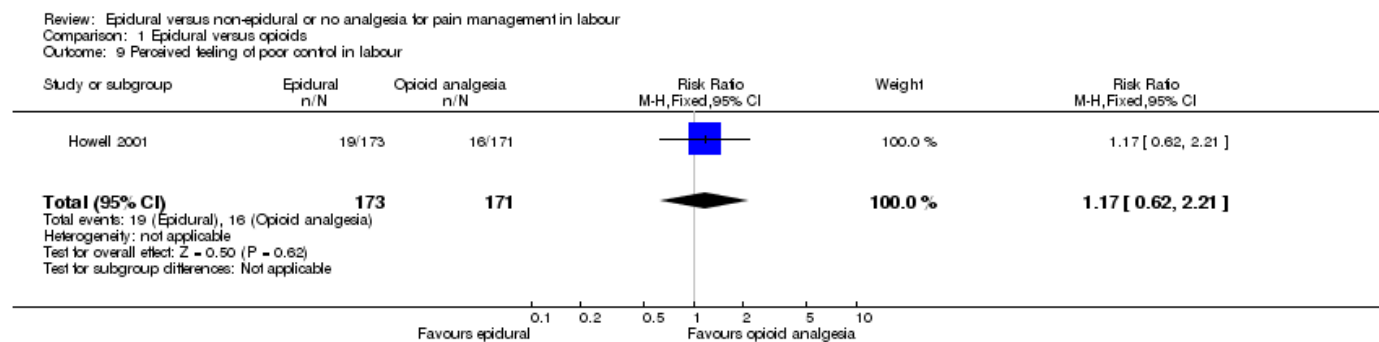


Figure 3

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

110 per 1000 women (95% CI 58 to 206) with epidural compared with 94 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

OUTCOME 1.4 Need for additional analgesia

Narrative result

16 RCTs with 5099 participants found that fewer women had need for additional analgesia with epidural than with opioid analgesia.[4]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the 16 studies, 7 (44%) failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and 11 (69%) had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (RR 0.10, 95% CI 0.04 to 0.25).

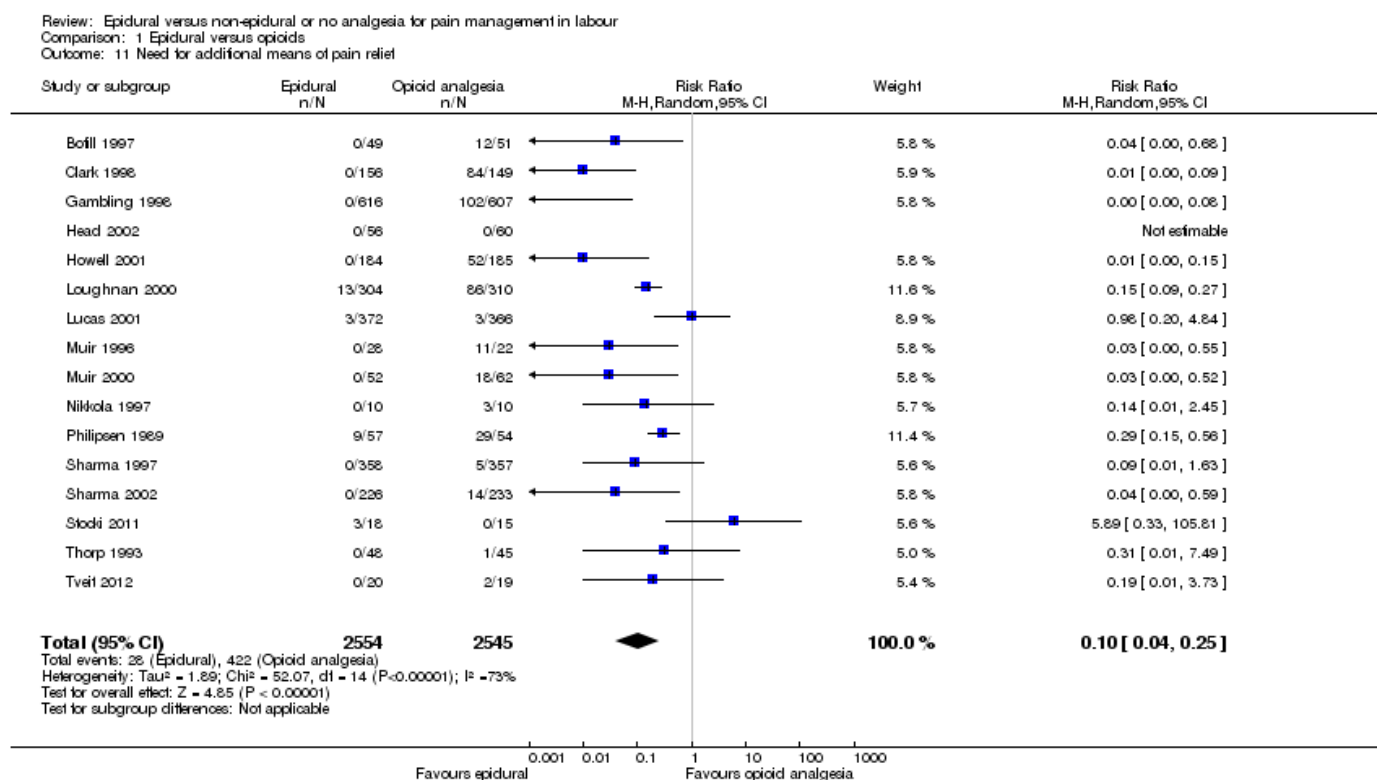


Figure 4

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

17 per 1000 women (95% CI 7 to 42) with epidural compared with 168 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. [Epidural versus non-epidural or no analgesia for pain management in labour](#). *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

› **OUTCOME 1.5 Assisted vaginal birth**

Narrative result

30 RCTs with 9948 participants found that more women had assisted vaginal birth with epidural than with opioid analgesia.[5]

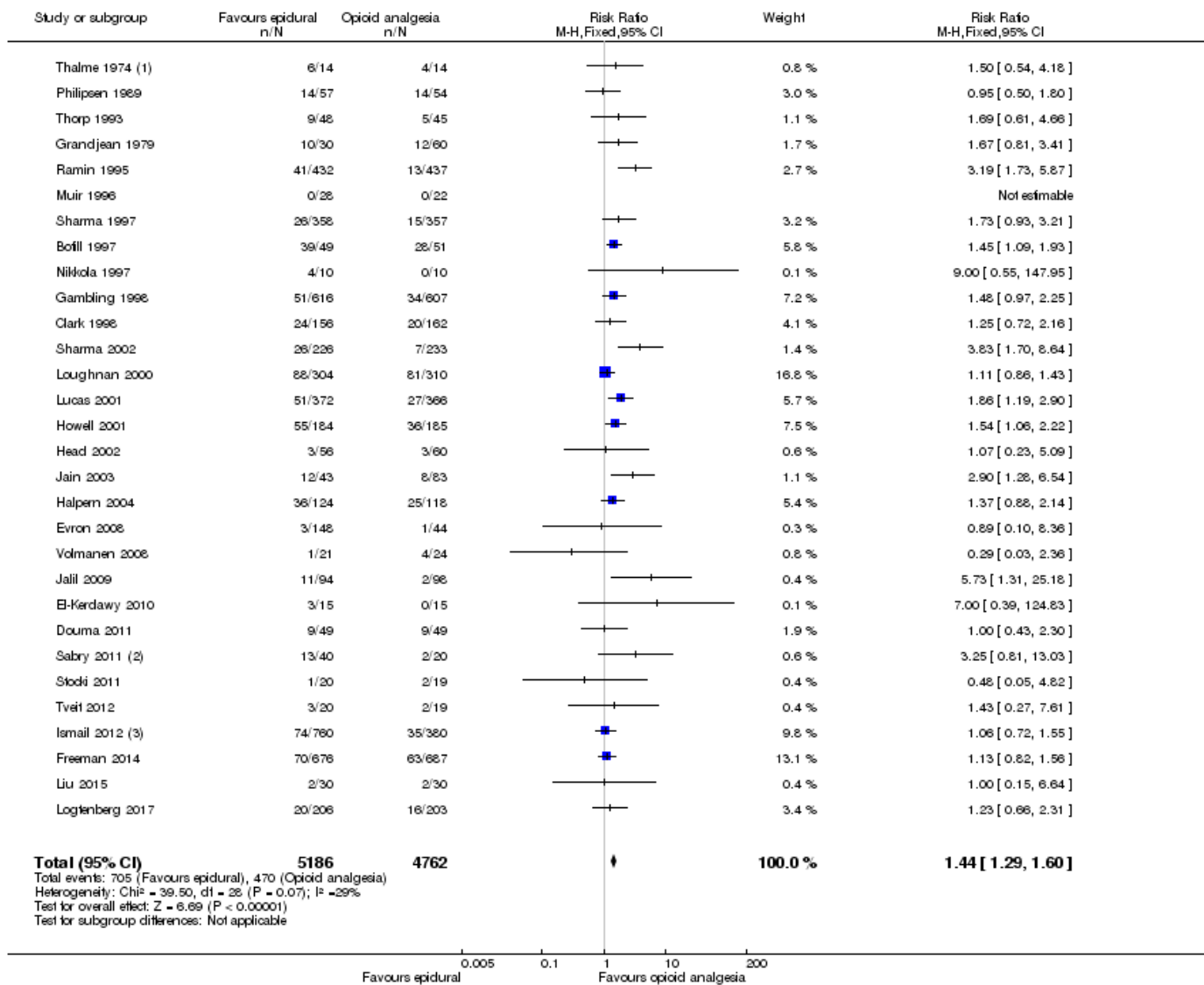
Quality of the evidence

The reviewers performed a GRADE assessment of the quality of evidence for this outcome at this time point and stated that the evidence was low certainty. [See Summary of findings from Cochrane Review](#)

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of opioid analgesia (RR 1.44, 95% CI 1.29 to 1.60).

Review: Epidural versus non-epidural or no analgesia for pain management in labour
 Comparison: 1 Epidural versus opioids
 Outcome: 1.2 Assisted vaginal birth



(1) Pethidine + chlorpromazine 12.5 mg x 1, then Entonox at 8cm, and pudendal block for delivery using 20 mL 1% prilocaine.
 (2) Epidural group includes combined spinal epidural and epidural
 (3) Combined spinal epidural and epidural data

Figure 5

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

113 per 1000 women (95% CI 102 to 126) with epidural compared with 79 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> **OUTCOME 1.6 Cesarean section**

Narrative result

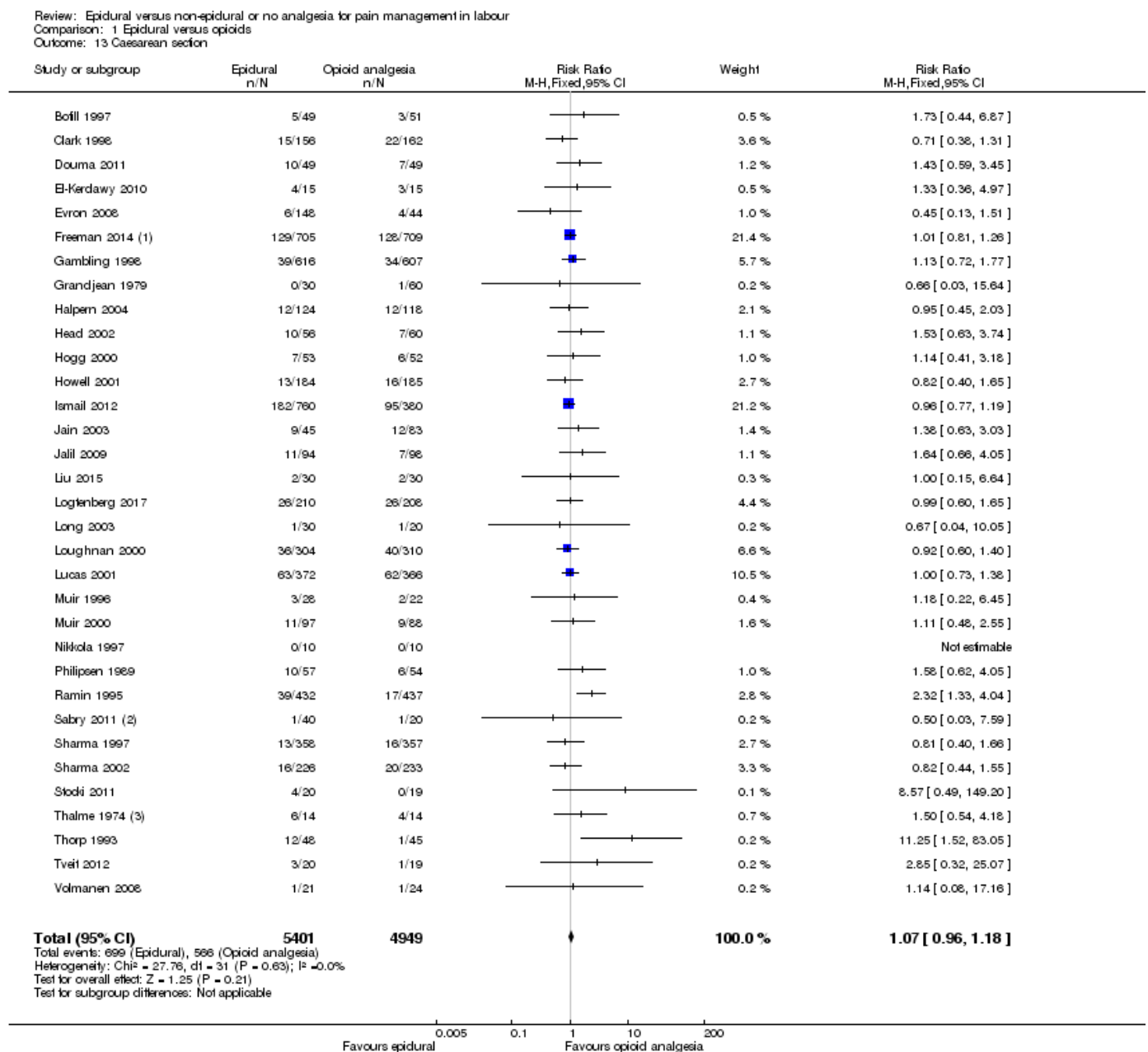
33 RCTs with 10350 participants found no statistically significant difference between groups.[6]

Quality of the evidence

The reviewers performed a GRADE assessment of the quality of evidence for this outcome at this time point and stated that the evidence was moderate certainty. See [Summary of findings from Cochrane Review](#)

Relative effect or mean difference

There was no statistically significant difference between groups (RR 1.07, 95% CI 0.96 to 1.18).



(1) Includes women excluded for elective caesarean before labour

(2) Epidural group includes combined spinal epidural and epidural

(3) Pethidine + chlorpromazine 12.5 mg x 1, then Entonox at 8cm, and pudendal block for delivery using 20 mL 1% prilocaine.

Figure 6

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

119 per 1000 women (95% CI 107 to 131) with epidural compared with 111 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> **OUTCOME 1.7 Neonatal intensive care unit admission**

Narrative result

Eight RCTs with 4488 participants found no statistically significant difference between groups.[7]

Quality of the evidence

The reviewers performed a GRADE assessment of the quality of evidence for this outcome at this time point and stated that the evidence was moderate certainty. See [Summary of findings from Cochrane Review](#)

Relative effect or mean difference

There was no statistically significant difference between groups (RR 1.03, 95% CI 0.95 to 1.12).

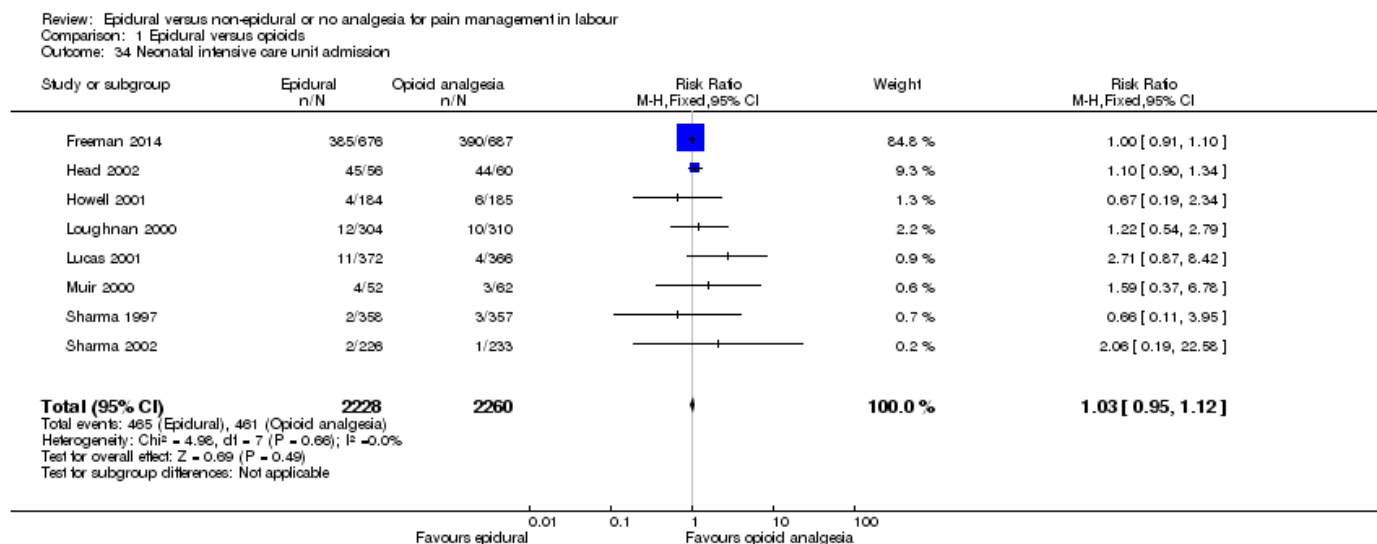


Figure 7

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

33 per 1000 people (95% CI 31 to 36) with epidural compared with 32 per 1000 people with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

› OUTCOME 1.8 Maternal adverse effects

Narrative result

A range of maternal adverse effects were assessed (long-term backache, hypotension, postnatal depression, motor blockade, respiratory depression, headache, perineal trauma requiring suturing, nausea/vomiting, itching, fever, shivering, drowsiness, urinary retention, malposition, surgical amniotomy). Where a statistically significant difference was observed between groups, more women receiving epidural had hypotension, motor blockade, fever, or urinary retention whereas more women receiving opioids had respiratory depression requiring oxygen administration or nausea and vomiting. Click below for details.[8]

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

› Subgroup analysis 1.8.1 Maternal adverse effects - [subgroup: hypotension]

Narrative result

Ten RCTs with 4212 participants found that more women had hypotension with epidural than with opioid analgesia. Maternal hypotension was not defined by trialists.[9]

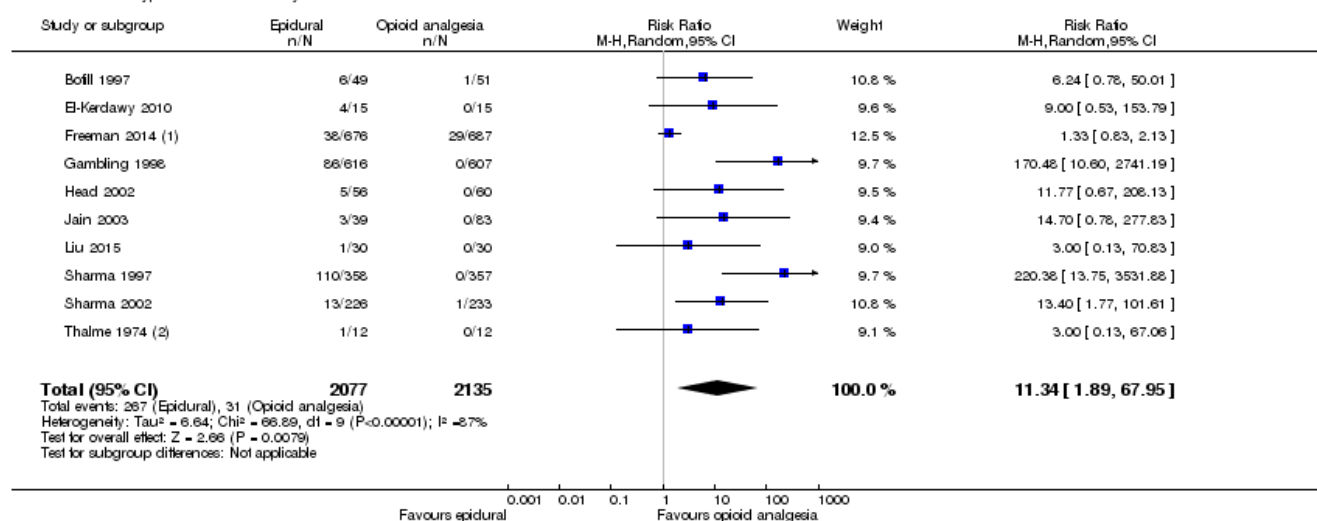
Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the 10 studies, 7 failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and 7 had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of opioid analgesia (RR 11.34, 95% CI 1.89 to 67.95).

Review: Epidural versus non-epidural or no analgesia for pain management in labour
 Comparison: 1 Epidural versus opioids
 Outcome: 15 Hypotension as defined by trial authors



(1) Data only given for women who received analgesia. Number randomised - elective CS showed here.

(2) Pethidine + chlorpromazine 12.5 mg x 1, then Entonox at 8cm, and pudendal block for delivery using 20 mL 1% prilocaine.

Figure 8

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

We could not calculate absolute results for this outcome because of low event rates.

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.8.2 Maternal adverse effects - [subgroup: motor blockade]

Narrative result

Three RCTs with 322 participants found that more women had motor blockade with epidural than with opioid analgesia.[10]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the three studies, two (66%) failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and all had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of opioid analgesia (RR 31.71, 95% CI 4.16 to 241.99).

Review: Epidural versus non-epidural or no analgesia for pain management in labour
 Comparison: 1 Epidural versus opioids
 Outcome: 1.7 Motor blockade

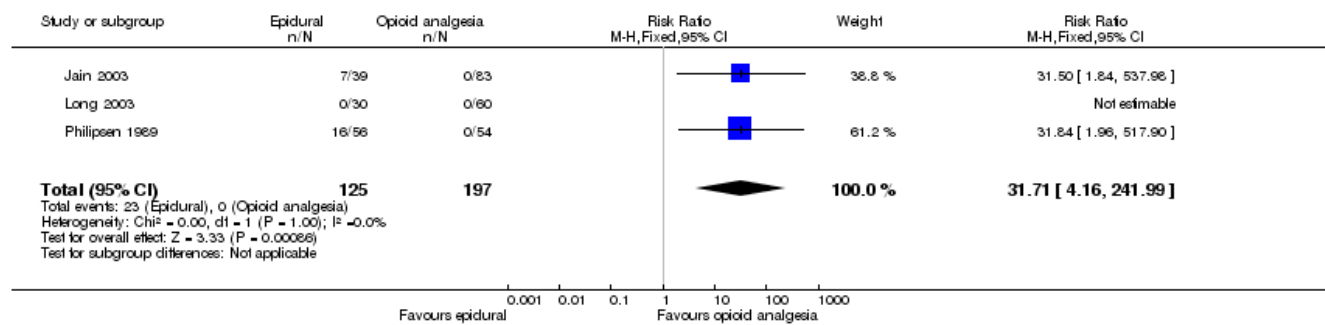


Figure 9

Forest plot from Cochrane Review

[Open in figure viewer](#)

Absolute effect

We could not calculate absolute results for this outcome because there were no events in women receiving opioids.

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.8.3 Maternal adverse effects - [subgroup: respiratory depression requiring oxygen administration]

Narrative result

Five RCTs with 2031 participants found that fewer women had respiratory depression requiring oxygen administration with epidural than with opioid analgesia.[11]

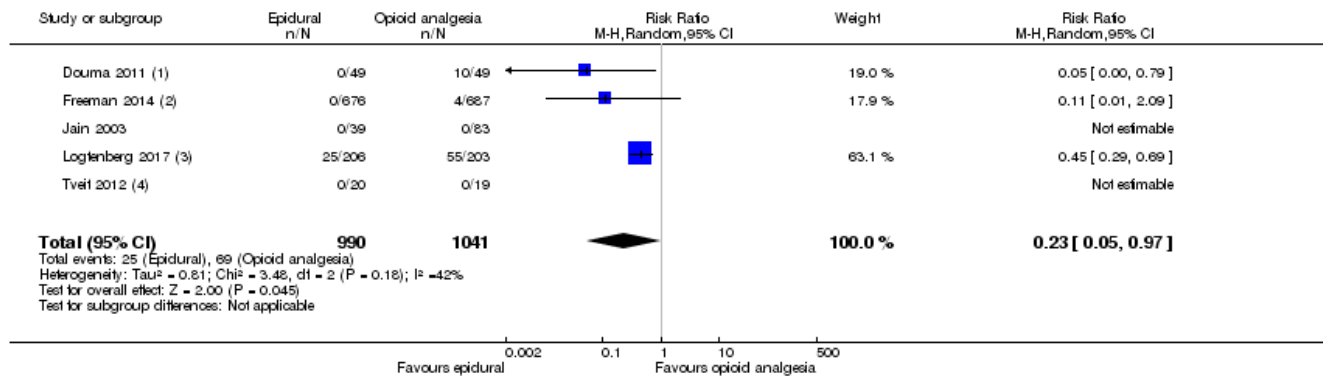
Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the five studies, two (40%) failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and all had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (RR 0.23, 95% CI 0.05 to 0.97).

Review: Epidural versus non-epidural or no analgesia for pain management in labour
 Comparison: 1 Epidural versus opioids
 Outcome: 18 Respiratory depression requiring oxygen administration



(1) Epidural compared with patient controlled remifentanyl

(2) Not all women received analgesia

(3) Oxygen sats below 95%. Not all women received analgesia, number randomised excluding women having elective caesarean before labour used as denominator.

(4) Below 9 breaths per minute

Figure 10

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

1 per 1000 women (95% CI 0 to 6) with epidural compared with 6 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.8.4 Maternal adverse effects - [subgroup: nausea and vomiting]

Narrative result

15 RCTs with 4440 participants found that fewer women had nausea and vomiting with epidural than with opioid analgesia.[12]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the 15 studies, 8 (53%) failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and 9 (60%) had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (RR 0.62, 95% CI 0.45 to 0.87).

Review: Epidural versus non-epidural or no analgesia for pain management in labour
 Comparison: 1 Epidural versus opioids
 Outcome: 21 Nausea and vomiting

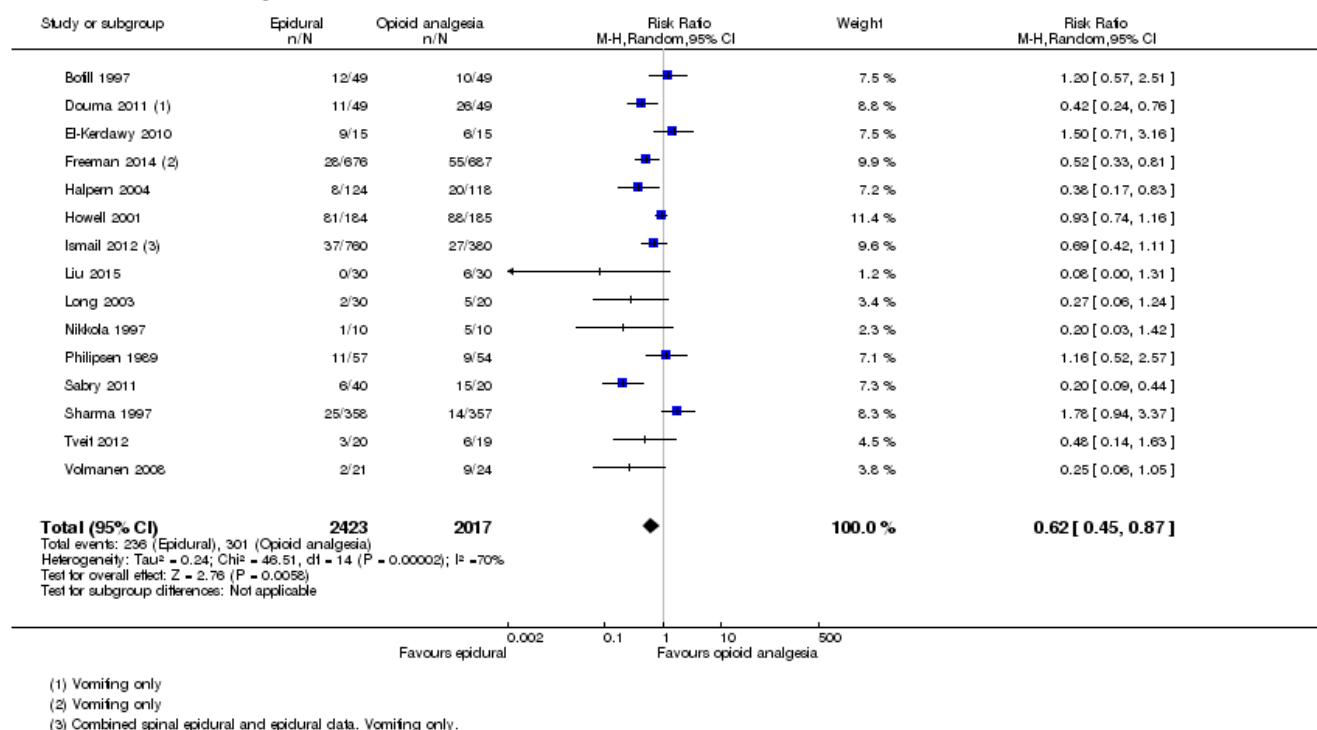


Figure 11

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

50 per 1000 women (95% CI 36 to 70) with epidural compared with 80 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.8.5 Maternal adverse effects - [subgroup: fever > 38 ° C]

Narrative result

Nine RCTs with 4276 participants found that more women had fever > 38 ° c with epidural than with opioid analgesia.[13]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the nine studies, four (44%) failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and 8 (89%) had high or unclear numbers of

withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of opioid analgesia (RR 2.51, 95% CI 1.67 to 3.77).

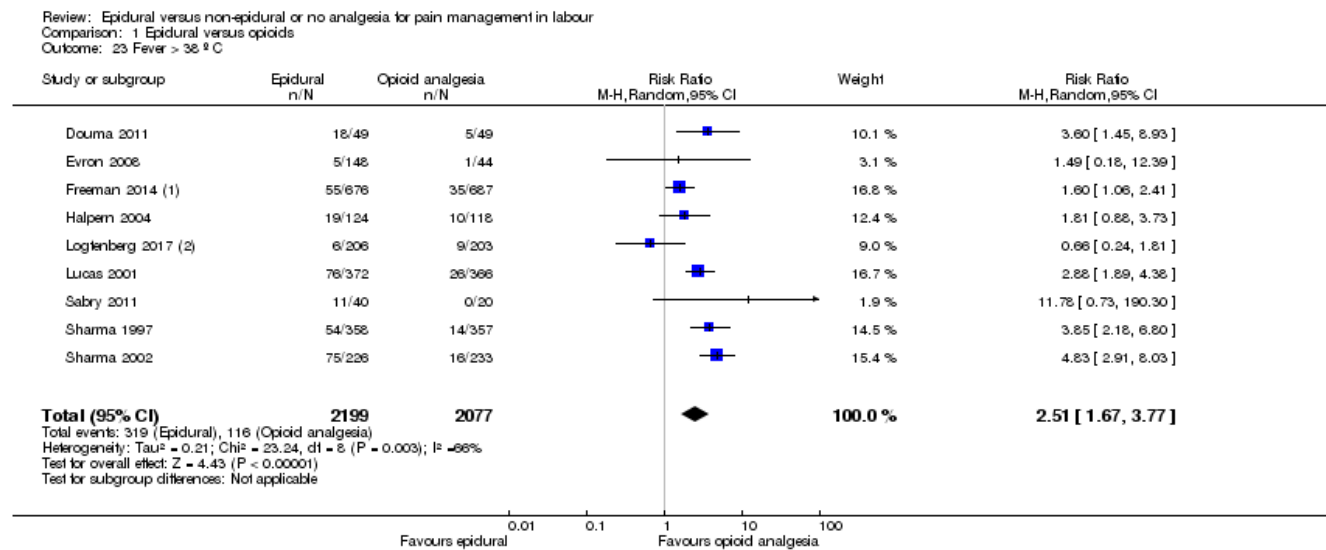


Figure 12

[Open in figure viewer](#)

Forest plot from Cochrane Review

Absolute effect

128 per 1000 women (95% CI 85 to 192) with epidural compared with 51 per 1000 women with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.8.6 Maternal adverse effects - [subgroup: urinary retention]

Narrative result

Four RCTs with 343 participants found that more women had urinary retention with epidural than with opioid analgesia.[14]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the four studies, three (75%) failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and all had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of opioid analgesia (RR 14.18, 95% CI 4.52 to 44.45).

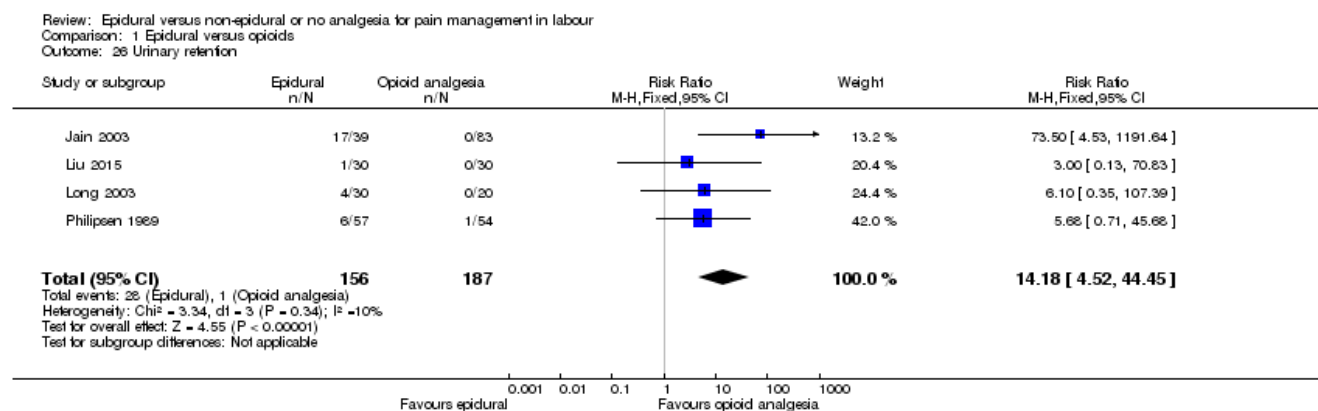


Figure 13

Forest plot from Cochrane Review

[Open in figure viewer](#)

Absolute effect

We could not calculate absolute results for this outcome because of low event rates.

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> OUTCOME 1.9 Neonatal adverse effects

Narrative result

A range of neonatal adverse effects were assessed (acidosis (defined as cord blood arterial pH less than 7.2 or less than 7.15), naloxone administration, meconium staining of labor, admission to special care baby unit/neonatal intensive care unit, Apgar score less than seven at five minutes).

There was no evidence of a difference between groups except that fewer babies of women receiving epidural had acidosis cord arterial pH < 7.2 at delivery or were administered naloxone. More babies of mothers taking opioids had an Apgar score of less than 7 at 5 minutes, but the difference between groups did not quite reach statistical significance. Click below for details.[15]

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> **Subgroup analysis 1.9.1 Neonatal adverse effects - [subgroup: Acidosis defined by cord arterial pH < 7.2 at delivery]**

Narrative result

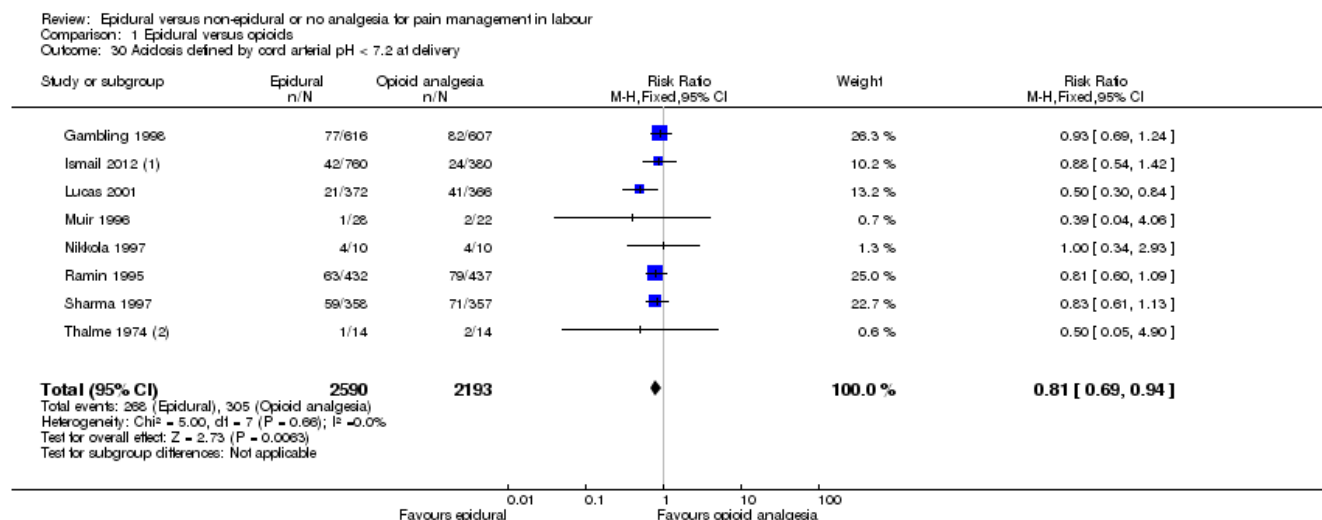
Eight RCTs with 4783 participants found that fewer infants had acidosis defined by cord arterial pH < 7.2 at delivery with epidural than with opioid analgesia.[16]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the eight studies, four failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and seven (88%) had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (RR 0.81, 95% CI 0.69 to 0.94).



(1) Combined spinal epidural and epidural data.

(2) Pethidine + chlorpromazine 12.5 mg x 1, then Entonox at 8cm, and pudendal block for delivery using 20 mL 1% prilocaine.

Figure 14

Forest plot from Cochrane Review

[Open in figure viewer](#)

Absolute effect

109 per 1000 infants (95% CI 94 to 127) with epidural compared with 135 per 1000 infants with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.9.2 Neonatal adverse effects - [subgroup: naloxone administration]

Narrative result

Ten RCTs with 2645 participants found that fewer infants required naloxone with epidural than with opioid analgesia.[17]

Risk of bias of studies

The reviewers did not perform a GRADE assessment of the quality/certainty of the evidence. Of the 10 studies, five failed to report adequate allocation concealment and/or random sequence generation, none reported adequate blinding of participants/carers/outcome assessors and 7 had high or unclear numbers of withdrawals.

Relative effect or mean difference

There was a statistically significant difference between groups, in favor of epidural (RR 0.15, 95% CI 0.10 to 0.23).

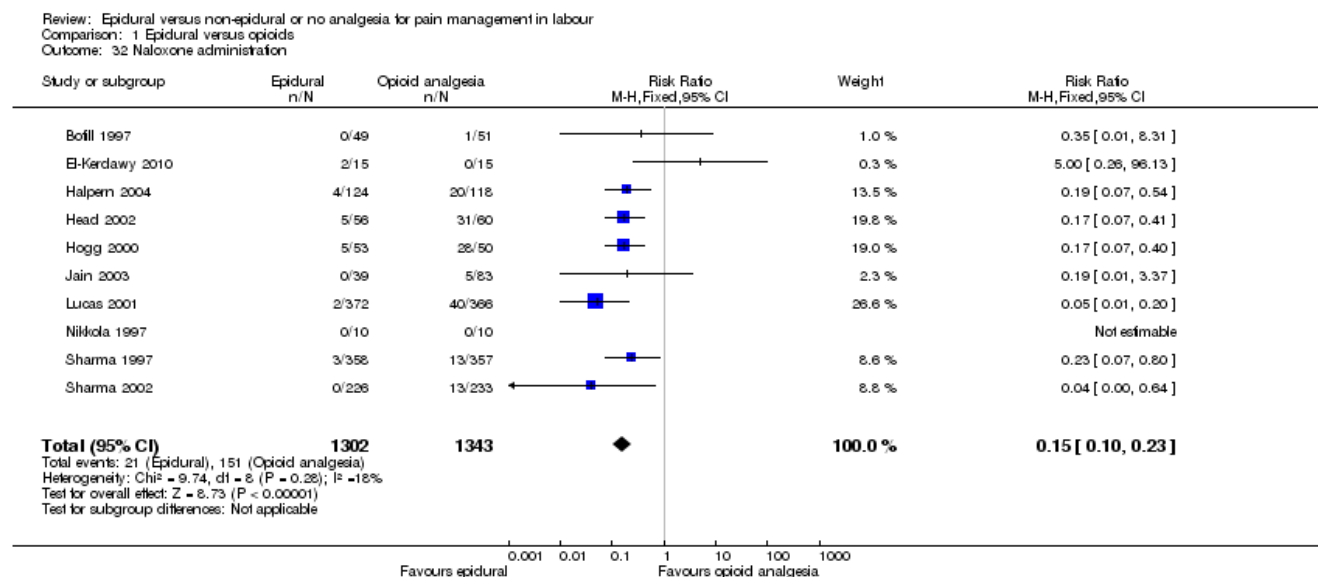


Figure 15

Forest plot from Cochrane Review

[Open in figure viewer](#)

Absolute effect

9 per 1000 infants (95% CI 6 to 13) with epidural compared with 56 per 1000 infants with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

> Subgroup analysis 1.9.3 Neonatal adverse effects - [subgroup: Apgar score less than 7 at 5 minutes]**Narrative result**

22 RCTs with 8752 participants found no statistically significant difference between groups.[18]

Quality of the evidence

The reviewers performed a GRADE assessment of the quality of evidence for this outcome at this time point and stated that the evidence was low certainty. See [Summary of findings from Cochrane Review](#)

Relative effect or mean difference

There was no statistically significant difference between groups (RR 0.73, 95% CI 0.52 to 1.02).

Review: Epidural versus non-epidural or no analgesia for pain management in labour
 Comparison: 1 Epidural versus opioids
 Outcome: 35 Apgar score less than 7 at 5 minutes

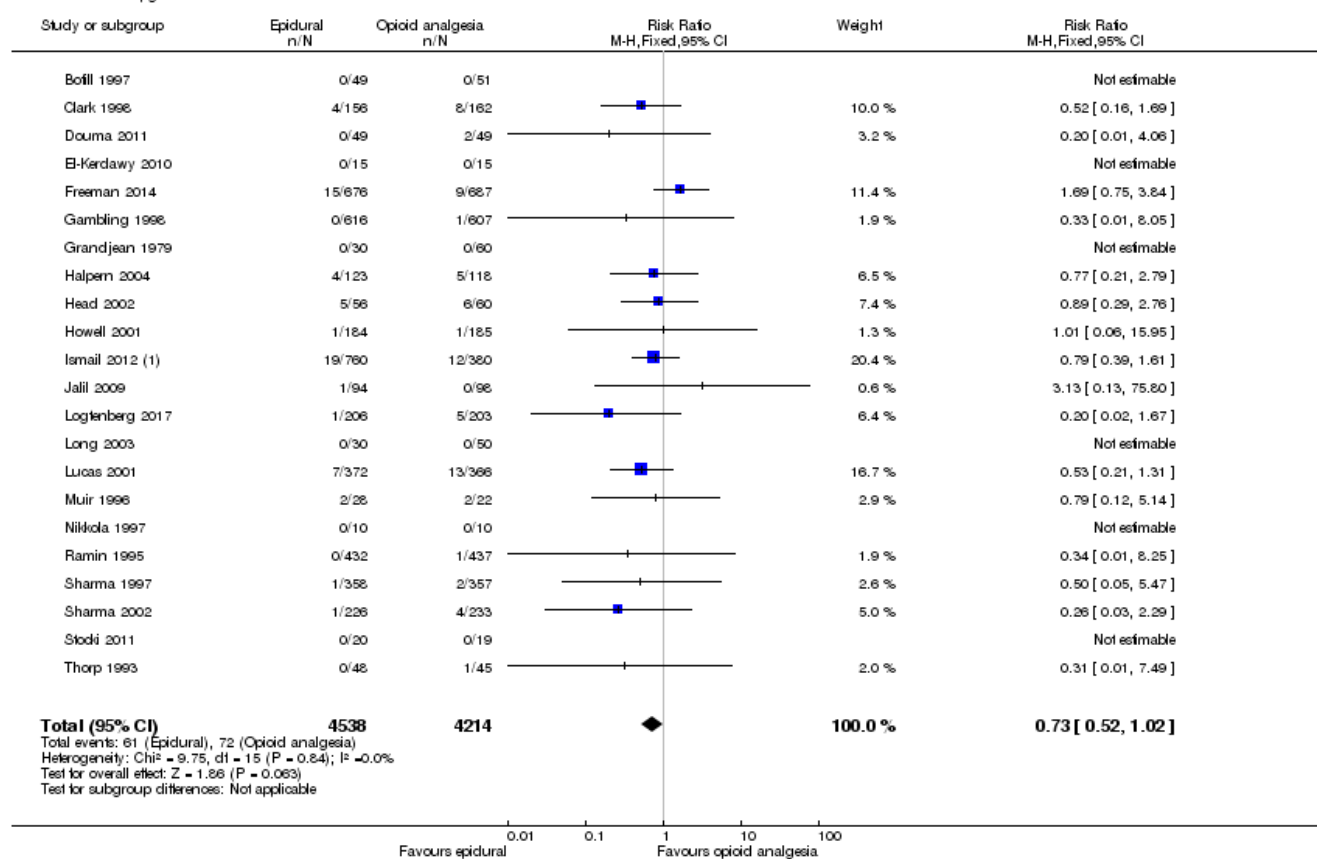


Figure 16

Forest plot from Cochrane Review

[Open in figure viewer](#)

Absolute effect

10 per 1000 infants (95% CI 7 to 13) with epidural compared with 13 per 1000 infants with opioid analgesia (calculated using median event rate).

Reference

Anim-Somuah M, Smyth RMD, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. *Cochrane Database of Systematic Reviews* 2018, Issue 5. Art. No.: CD000331. DOI: 10.1002/14651858.CD000331.pub4. Search date April 2017

Population, Intervention, Comparator

Population

Primiparous or multiparous women (age range not reported), most (80% of trials) at > 36 weeks' gestation in spontaneous labor with no complications; exceptions included induced labors and/or women with hypertension/preeclampsia

Intervention

Epidural analgesia, where reported bupivacaine or levobupivacaine in most trials, supplemented by fentanyl in around one third of trials. Around one third of trials administered a fluid preload and epidural by continuous infusion

Comparator

Opioids: intravenous or intramuscular pethidine (17 trials), remifentanyl (9 trials), fentanyl (3 trials), butorphanol, pethidine plus tramadol, phenoperidine, tramadol, or ondansetron (1 trial of each)

Additional Information

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