Intrathecal opioids versus epidural local anesthetics for labor analgesia: a meta-analysis

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Authors' objectives
To compare the analgesic efficacy, side-effects and obstetric outcome of single-injection intrathecal opioid techniques versus epidural local anaesthetics in labouring women.

Searching
MEDLINE was searched from 1989 to 2000; some of the search terms were listed. The authors also stated that they searched another (unspecified) database. The search was limited to English language articles and articles published in peer-reviewed journals. In addition, the bibliographies of retrieved articles and of recent reviews were searched for further studies. No reliability tests for locating research results were carried out.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials were included in the review. Studies in which the sample size was not reported, or in which there was no explicit comparison between intrathecal opioids and epidural local anaesthetics, were excluded from the review.

Specific interventions included in the review
The inclusion criteria specified intrathecal opioids and epidural local anaesthetics used during labour.

Participants included in the review
The inclusion criteria were not explicitly stated, but women in labour given intrathecal opioids or epidural local anaesthetics were included in the review. The mean age of the participants ranged from 23.4 to 33.0 years, and the mean cervical dilation before the administration of analgesia ranged from 3.6 to 4.5 cm. The participants were reported to be healthy with a singleton foetus.

Outcomes assessed in the review
The inclusion criteria specified analgesic measures, incidence of motor block, pruritus, nausea, hypotension, method of delivery and/or Apgar scores. The outcomes included in the review were analgesia, method of delivery, pruritus and nausea.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The inclusion criteria specified studies published in peer-reviewed journals, but the authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted on patient and study design characteristics, outcome variables, research design, duration of treatment, and whether a follow-up measure was used.

Methods of synthesis
How were the studies combined?
A 'fail-safe N' value was calculated a priori to assess potential publication bias. The studies were combined in a meta-
analysis for outcomes where the authors considered there were sufficient data. Pooling was conducted for the outcomes of analgesia, motor block, rate of unassisted delivery and the side-effects of maternal pruritus and nausea. Dichotomous results were combined using the Mantel-Haenszel method, while continuous data were combined using the Stouffer combined probability test and the Fisher combined probability test. A criterion of P less than or equal to 0.01 was used to determine statistical significance.

How were differences between studies investigated?
Chi-squared tests for heterogeneity were carried out for each outcome.

Results of the review
Seven studies with 332 patients, of whom 161 received intrathecal intervention and 171 received epidural intervention, were included in the review. Studies not reporting the sample size were excluded from the review.

Analgesia.
Six studies reported the visual analogue scale (VAS) scores at 15 to 20 minutes. VAS weighted results from the Stouffer combined test indicated that there was no significant difference (using authors’ criterion) between intrathecal opioids and epidural local anaesthetics (Weighted Zc = 1.80; P=0.036; effect size estimate, weighted r = 0.15). A chi- squared test found no significant heterogeneity in either the VAS score (chi-squared 3.06, d.f.=4, P>0.10) or the effect size (chi-squared 2.46, d.f.=4, P>0.10).

Mode of delivery.
Five studies found no significant differences in the likelihood (odds ratio, OR) of a Caesarean delivery as opposed to a vaginal delivery (OR 0.50, 99% confidence interval, CI: 0.19, 1.30; chi-squared 0.002, P>0.10). A chi-squared test found no evidence of heterogeneity between the studies (chi-squared 3.04, P>0.10). There was also no significant difference in the rate of spontaneous delivery versus operative delivery (OR 1.32, 99% CI: 0.62, 2.80; chi-squared 0.079, P>0.10) and there was no evidence of heterogeneity between the studies (chi-squared 1.86, P>0.10).

Maternal side-effects.
Fewer than 3 studies assessed hypotension, fever or maternal satisfaction. Five studies assessed maternal pruritus and found that it occurred significantly more often in women given intrathecal opioids (OR 14.01, 99% CI: 6.92, 28.33; chi-squared 77.17, P<0.001). There was no evidence of significant heterogeneity between the studies (chi-squared 3.29, P>0.10). There was no significant difference in the occurrence of maternal nausea (OR 0.95, 99% CI: 0.37, 2.43; chi-squared 0.020, P>0.10) and no evidence of heterogeneity between the studies (chi-squared 4.36, P>0.10).

Authors’ conclusions
Intrathecal opioids provide comparable early labour analgesia when compared with epidural local anaesthetics and there is no difference in the method of delivery with the two techniques. However, intrathecal opioid administration results in a greater incidence of pruritus.

CRD commentary
The review question was clear although not all the inclusion criteria were explicitly stated. The search included one relevant electronic database and covered a limited range of dates. The search was limited to English language articles and also published research, which may have led to the introduction of language bias and publication bias, respectively. The authors stated that no reliability tests for locating research results were carried out. They did not state that they used methods to minimise bias and error when selecting the studies for inclusion in the review or when extracting the data. They also did not state that they assessed validity, apart from excluding studies that had not been published in peer-reviewed journals. However, study details, which give some information on factors related to study validity, were provided.

The meta-analysis was carried out using appropriate methods, although there was a degree of clinical heterogeneity
among the studies. The narrative discussion included only those outcomes for which the meta-analysis was conducted, and did not discuss outcomes for which fewer than three studies were found (i.e. hypotension, fever and maternal satisfaction). The authors’ conclusions accurately reflected the results of the review, although the review may have excluded relevant studies because of the limited scope of the search.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that further research should evaluate the risk of maternal side-effects and, in particular, of neuraxial infections following intrathecal opioid injections.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.