

## Epidural Analgesia for Labor Pain

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The Cochrane Abstract on the next page is a summary of a review from the Cochrane Library. It is accompanied by an interpretation that will help clinicians put evidence into practice. Drs. Hitzeman and Chin present a clinical scenario and question based on the Cochrane Abstract, followed by an evidence-based answer and a critique of the review. The practice recommendations in this activity are available at <http://summaries.cochrane.org/CD000331>.



This clinical content conforms to AAFP criteria for evidence-based continuing medical education (EB CME). See CME Quiz on page 236.

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### Clinical Scenario

A 24-year-old primigravida woman at 28 weeks' gestation presents for a routine prenatal visit. She asks about the benefits and risks of epidural analgesia for her upcoming delivery.

### Clinical Question

For management of labor pain, how does epidural analgesia compare with nonepidural pain control or no analgesia in terms of maternal and newborn outcomes?

### Evidence-Based Answer

Compared with other types of analgesia or no analgesia, epidurals offered better pain relief, but were associated with a longer second stage of labor and increased risk of instrumental vaginal delivery, maternal fever, and oxytocin (Pitocin) administration. There were no statistically significant differences in overall rates of cesarean delivery, Apgar scores, admission to the neonatal intensive care unit, and maternal satisfaction. Few studies evaluated epidural analgesia in induced labors.<sup>1</sup> (Strength of Recommendation: A, based on consistent, good-quality patient-oriented evidence.)

### Practice Pointers

Attempts to alleviate labor pain date back to the ancient use of opiates by the Chinese and herbal remedies by the Egyptians.<sup>2</sup> The epidural catheter was developed in the mid-20th century; today, 61 percent of U.S. singleton vaginal deliveries occur with epidural or spinal analgesia.<sup>3</sup> Few dispute that epidural analgesia provides good pain relief, but questions remain about its associations with prolonged labor, increased interventions, and higher rates of cesarean delivery.

Upon meta-analysis of 38 studies involving nearly 10,000 women, this Cochrane review found that epidural analgesia provided

superior pain relief when compared with nonepidural pain control or no analgesia.<sup>1</sup> The second stage of labor was prolonged, on average, by about 14 minutes in the epidural group. Epidural use was associated with increased risk of instrumental vaginal delivery (number needed to harm = 20), oxytocin use, maternal fever, and maternal hypotension. Fetal outcomes were comparable in all groups. There was a statistically nonsignificant trend toward increased overall risk of cesarean delivery in the epidural group (risk ratio [RR] = 1.10; 95% confidence interval [CI], 0.97 to 1.25). In a subgroup analysis that included approximately 5,000 women, epidural use was associated with a higher risk of cesarean delivery performed for fetal distress (RR = 1.43; 95% CI, 1.03 to 1.97).

Limitations of this review included variations in labor management protocols and epidural regimens, and high crossover rates. For example, in the largest study of 1,330 women, 35 percent of the 664 women randomized to receive epidural analgesia never received it (one-half refused the offer of an epidural, and one-half delivered before receiving it). Of the 666 women randomized to receive intravenous meperidine (Demerol), 34 percent strayed from the treatment protocol (either patients received epidural analgesia because of inadequate pain relief with meperidine or management was not specified).<sup>4</sup> Furthermore, systemic opioids were used in most of the control groups (33 of 38 studies), making this review less applicable to other labor pain interventions such as sterile water injection, water immersion, acupuncture, or local anesthetic nerve blocks. Finally, only four of the studies included women with induced labors.

Because epidurals prolong the second stage of labor, some have suggested that

## Cochrane Abstract

**Background:** Epidural analgesia is a central nerve block technique achieved by injection of a local anesthetic close to the nerves that transmit pain and is widely used as a form of pain relief in labor. However, there are concerns regarding unintended adverse effects on the mother and infant.

**Objectives:** To assess the effects of all modalities of epidural analgesia (including combined spinal-epidural) on the mother and the baby, when compared with nonepidural analgesia or no pain relief during labor.

**Search Methods:** The authors searched the Cochrane Pregnancy and Childbirth Group's Trials Register (March 31, 2011).

**Selection Criteria:** Randomized controlled trials comparing all modalities of epidural with any form of pain relief not involving regional blockade, or no pain relief in labor.

**Data Collection and Analysis:** Two of the review authors independently assessed trials for eligibility and methodologic quality, and extracted all data. Data were entered into RevMan and double-checked for accuracy. Primary analysis was by intention to treat; subgroup and sensitivity analyses were conducted where substantial heterogeneity was evident.

**Main Results:** The authors included 38 studies involving 9,658 women; all but five studies compared epidural analgesia with opiates. Epidural analgesia was found to offer better pain relief (mean difference [MD] = -3.36; 95% confidence interval [CI], -5.41 to -1.31; three trials, 1,166 women); a reduction in the need for additional pain relief (risk ratio [RR] = 0.05; 95% CI, 0.02 to 0.17; 15 trials, 6,019 women); a reduced risk of acidosis (RR = 0.80; 95% CI, 0.68 to 0.94; seven trials, 3,643 women); and a reduced risk of naloxone administration (RR = 0.15; 95% CI, 0.10 to 0.23; 10 trials, 2,645 women). However, epidural analgesia was associated with an increased risk of assisted vaginal birth (RR = 1.42; 95% CI, 1.28 to 1.57; 23 trials, 7,935 women), maternal hypotension (RR = 18.23;

95% CI, 5.09 to 65.35; eight trials, 2,789 women), motor-blockade (RR = 31.67; 95% CI, 4.33 to 231.51; three trials, 322 women), maternal fever (RR = 3.34; 95% CI, 2.63 to 4.23; six trials, 2,741 women), urinary retention (RR = 17.05; 95% CI, 4.82 to 60.39; three trials, 283 women), longer second stage of labor (MD = 13.66 minutes; 95% CI, 6.67 to 20.66; 13 trials, 4,233 women), oxytocin administration (RR = 1.19; 95% CI, 1.03 to 1.39; 13 trials, 5,815 women), and cesarean delivery for fetal distress (RR = 1.43; 95% CI, 1.03 to 1.97; 11 trials, 4,816 women). There was no evidence of a statistically significant difference in the risk of cesarean delivery overall (RR = 1.10; 95% CI, 0.97 to 1.25; 27 trials, 8,417 women), long-term backache (RR = 0.96; 95% CI, 0.86 to 1.07; three trials, 1,806 women), Apgar score of less than seven at five minutes (RR = 0.80; 95% CI, 0.54 to 1.20; 18 trials, 6,898 women), or maternal satisfaction with pain relief (RR = 1.31; 95% CI, 0.84 to 2.05; seven trials, 2,929 women). The authors found substantial heterogeneity for the following outcomes: pain relief, maternal satisfaction, need for additional means of pain relief, length of second stage of labor, and oxytocin augmentation. This could not be explained by subgroup or sensitivity analyses, where data allowed analysis. No studies reported on rare but potentially serious adverse effects of epidural analgesia.

**Authors' Conclusions:** Epidural analgesia appears to be effective in reducing pain during labor. However, women who use this form of pain relief are at increased risk of having an instrumental delivery. Epidural analgesia had no statistically significant impact on the risk of cesarean delivery, maternal satisfaction with pain relief, or long-term backache, and did not appear to have an immediate effect on neonatal status as determined by Apgar scores. Further research may be helpful to evaluate rare but potentially severe adverse effects of epidural analgesia on women in labor and long-term neonatal outcomes.



These summaries have been derived from Cochrane reviews published in the Cochrane Database of Systematic Reviews in the Cochrane Library. Their content has, as far as possible, been checked with the authors of the original reviews, but the summaries should not be regarded as an official product of the Cochrane Collaboration; minor editing changes have been made to the text (<http://www.cochrane.org>).

waiting until later in labor to initiate epidurals or stopping epidurals in the second stage may improve outcomes. However, a systematic review comparing early (dilation of 3 cm or less) versus late (dilation of 4 cm or more) epidural initiation reported no difference in the risk of cesarean or instrumental vaginal delivery.<sup>5</sup> Another systematic review found that discontinuing epidural analgesia in the second stage increased pain, but did not reduce rates of instrumental or cesarean delivery or the duration of the second stage.<sup>6</sup>

Choice of analgesia during labor is an important and personal decision. The pain of childbirth is one of the most intense experiences of a woman's life. A systematic review found that women usually underestimate the level of pain that they will experience during labor and have less control than anticipated.<sup>7</sup> Physicians and patients should keep in mind that epidural analgesia is only one of many interventions available to assist women in labor. For example, a recent Cochrane review concluded that women with continuous labor support (e.g., doulas) were more likely to have shorter labors, spontaneous vaginal deliveries, and require less pain medication than women without such support.<sup>8</sup>

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