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Original Research Article

Labor epidural analgesia and the incidence of instrumental assisted delivery

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ABSTRACT

Objective: To assess the influence of labor epidural analgesia on the course of labor and to determine its association with instrumental assisted delivery rate.

Materials and methods: A retrospective case–control study was performed during 2007–2011 aiming to identify the relation between epidural analgesia (EA) and instrumental assisted delivery (IAD) rate. All patients in whom instrumental assistance for delivery was applied were allocated into either case (parturients who received EA and had IAD) or control (parturients who did not receive EA but had IAD) groups. Maternal demographic data, pregnancy and delivery characteristics as well as neonatal short-term outcome were studied.

Results: A total of 7675 vaginal deliveries occurred during the study period and 187 (2.43%) patients had IAD. Vacuum extraction was applied to 67 (2.16%) parturients who received EA, and to 120 (2.61%) who did not. The median duration of the first stage of labor was 510 min in the EA group as compared to 390 min in the control group ($P = 0.001$). The median duration of the second stage of labor among cases and controls was 60 and 40 min, respectively ($P < 0.0005$). Cases more often had their labor induced by oxytocin 80.3% as compared to 58.3% among controls ($P = 0.003$). There was no significant association between the use of EA and increased IAD rate (OR = 0.81; 95% CI, 0.60–1.09).

Conclusions: Labor EA did not increase the incidence of IAD and the risk of adverse neonatal outcomes, but was associated with prolonged first and second stages of labor.

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1. Introduction

Labor epidural analgesia (EA) is an increasingly used technique for pain relief of a parturient. In a recent Cochrane database review regarding pain management for women in labor, EA was acknowledged as the most effective pain management technique as compared with inhaled analgesia, systemic opioid and nonopioid analgesics, and nonpharmacologic interventions [1]. It enables to achieve high maternal satisfaction rates with regard to pain management, sense of control in labor, and overall childbirth experience [1,2]. In addition to analgesic efficacy, physiological benefits of EA for the mother and fetus are well-documented: it improves maternal cardiovascular and pulmonary physiology, uteroplacental perfusion and acid-base status of the fetus [3-6]. Since EA was introduced for labor pain relief, the controversy about the relation between EA and instrumental deliveries, cesarean section, as well as prolonged labor has originated. Further studies, however, found no EA association with increased cesarean section rate, but discussions regarding its influence on instrumental assisted delivery (IAD) rate and duration of labor persist [7-21].

2. Materials and methods

The study was performed in the maternal unit of a tertiary perinatology center. All the patients in whom instrumental assistance for delivery was applied from January 1, 2007, until November 24, 2011, were studied. All computer registry data and medical records were analyzed. Study patients were allocated into two groups: the epidural analgesia group (cases) comprised parturients who received EA and had vacuum extraction, and the control group (controls) consisted of parturients who did not receive EA, but had vacuum extraction. Epidural catheters for analgesia were placed at the L₂-L₃, L₃-L₄ or L₄-L₅ interspace, when patients had cervical dilation of ≥3 cm. A 3-mL epidural test dose of lidocaine (15 mg/mL) with epinephrine (5 μg/mL) was given to all patients. Parturients

were subsequently administered an initial epidural bolus of 10-15 mL bupivacaine (1 mg/mL) with fentanyl (2.5 μg/mL), which was followed by a continuous infusion of bupivacaine (1 mg/mL) with fentanyl (2 μg/mL) at a rate of 7-10 mL/h. Maternal demographic data, pregnancy and delivery characteristics, use of oxytocin and duration of delivery stages were studied. Neonatal outcomes of interest were birth weight, height, neonatal arterial pH, and Apgar scores at the first and fifth minutes. We performed our statistical analysis using SPSS for Windows (version 15). Demographic variables were assessed using descriptive statistics. Odds ratio with 95% confidence interval for IAD was estimated. Statistical analysis was performed using Student t test, Mann-Whitney U test and χ^2 test where appropriate. All data are presented as mean ± standard deviation (SD) unless indicated otherwise. A P value of less than 0.05 was considered statistically significant.

3. Results

A total of 7675 vaginal deliveries occurred in our maternal unit during the study period and 187 (2.43%) women had vacuum extraction. EA was given to 3093 (40.3%) parturients whereas 4582 (59.7%) received systemic opioid, inhalation analgesia or no analgesia at all. Instrumental assistance for delivery was applied to 67 (2.16%) women in labor who received EA and to 120 (2.61%) who did not. Three entries (1 case and 2 controls) were not studied due to lack of medical records (Fig. 1).

Patient demographics such as maternal age, height, weight, weight gain, and gestational age were comparable between groups. The mean age of study patients was 26 years with a mean gestational age of 38 weeks. Nulliparas requested EA significantly more often than multiparas: 54 and 12, respectively (P = 0.041) (Table 1). The median duration of the first stage of labor was 510 min in the EA group as compared with 390 min in the control group (P = 0.001). The median duration of the second stage of labor among cases and controls was 60 and 40 min, respectively (P < 0.0005). As presented in Table 2, the first stage of labor was statistically significantly prolonged in primiparas with EA, but not in multiparas. However, the

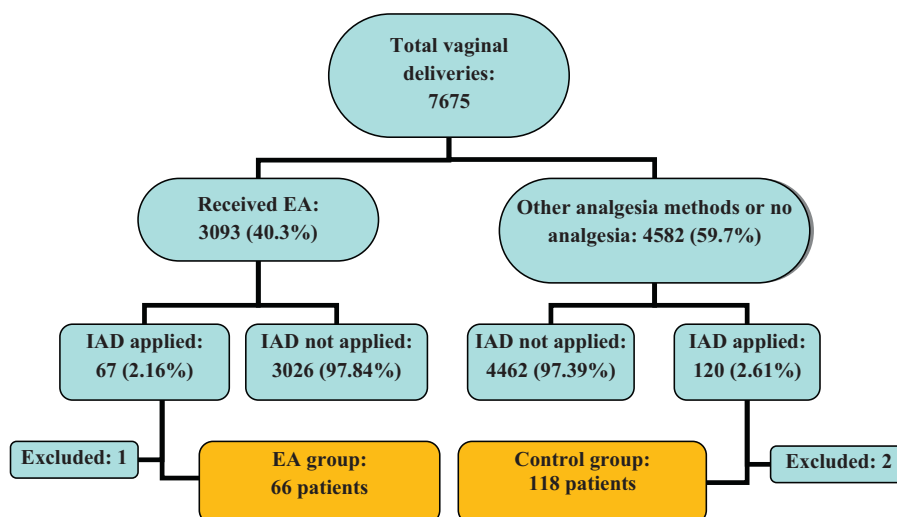


Fig. 1 - Flow chart of the study. EA, epidural analgesia; IAD, instrumental assisted delivery.

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