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Title: Air *vs.* Saline: Does the Technique Used to Identify the Epidural Space Affect the Quality of Analgesia?

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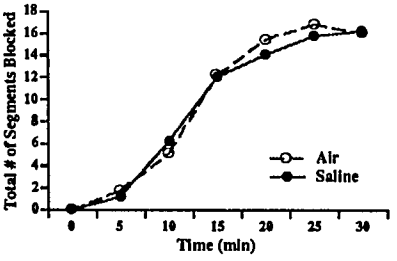
Introduction: By detecting the loss of resistance to injection of air or saline, anesthesiologists can identify the epidural space. In animals, epidural air persists for up to 24 h, often near the exit of nerve roots[1]. Recently, Dalens et. al.suggested that epidural air bubbles may impede the access of local anesthetic to nerve roots, causing a patchy distribution of sensory blockade[2]. In contrast, others suggest that epidural injection of saline may impair sensory blockade by diluting subsequently injected local anesthetic.[3] We designed this study to further investigate these hypotheses.

Methods: After approval by our IRB, we obtained oral consent from 50 ASA I-III laboring parturients. In a random order, we identified the epidural space with the loss of resistance technique injecting 7 ml of either air or preservative-free saline. Subsequently, a polyamide catheter was passed 2 cm into the epidural space and securred. With all patients lying supine with left uterine displacement and 30° head up tilt, we injected 0.25% bupivacaine as follows: 0 min: 3 ml, 3 min: 5 ml, 4 min: 4 ml. In 29 of the women, a blinded observer measured loss of temperature discrimination to alcohol and inquired about the quality of pain relief (excellent, good, fair or poor) every 5 minutes for the first 30 minutes after injection. In all patients we evaluated the extent of sensory blockade and the quality of analgesia at 30 minutes. Using analysis of variance for repeated measures and the Mann-Whitney U–test, we compared the onset duration and quality of sensory blockade in the two groups.

Results: The two patient groups did not differ in age, height, weight, gravidity, parity or previous number of epidurals. We found no significant differences in onset of sensory blockade (figure), quality of analgesia, total number of spinal segments blocked, the incidence of "patchy" block or the duration of blockade between the two groups.



Conclusion: Using 7 ml of either air or saline to identify the epidural space alters neither the onset nor the quality of sensory blockade in laboring parturients. Based on these findings, we doubt that epidural air is a significant cause of patchy distribution of sensory analgesia in laboring parturients. Similarly, the volume of saline used in this study neither augments nor inhibits the onset of sensory analgesia.

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A832

TITLE: RISK FACTORS ASSOCIATED WITH UNILATERAL BLOCKADE DURING LABOR EPIDURAL ANALGESIA.

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INTRODUCTION: The incidence of unilateral blockade (UB) after epidural analgesia for labor has been reported to be as high as 21% (1). Although many hypotheses (2) have been proposed to explain this high incidence in obstetrics, there is little available information about parturient's and technical factors that may be implicated. Therefore, we decided to study these factors in a large obstetrical population.

METHODS: After Institutional approval, 1590 term parturients were included in this longitudinal prospective study over a two years period (1989-1990). All parturients were first seen at our outpatient clinic at 36 ± 2 weeks of gestation where demographic data and history of previous epidural procedure, mild scoliosis and sciatica were collected. Those parturients with pregnancy-induced-hypertension were excluded from the study. On the day of delivery, epidural space was identified using a midline approach by loss of resistance to saline with a 17 G Tuohy needle. The patient's posture, the interspace used, the distance from skin to epidural space (DS-ES), and the occurrence of radicular pain or blood during needle and/or catheter insertion were recorded by the anesthetist. After an initial 3 ml test dose injected through the needle, the first dose of 0.25% plain bupivacaine (8 ± 1.8ml ; mean ± SD) was injected through either the needle or the catheter. UB was defined 30 minutes after epidural injection as unilateral pain relief. The first step of the study was to determine patient's and technical factors significantly associated with the occurrence of UB. The second step was to compare the incidence of UB in patients in whom these factors were (or not) present. Statistical analysis was performed using ANOVA, unpaired bilateral Student's t-test, chi-square analysis as required. $p < 0.01$ was considered statistically significant.

RESULTS: Age, parity, weight, height, body mass index, mild scoliosis, previous sciatica, fetal presentation, weight of the newborn are not significant risk factors for UB as well as parturient's posture, interspace used, DS-ES, occurrence of bloody epidural, and volume of bupivacaine injected. The only two independent factors significantly associated with UB are the occurrence of radicular pain and injection through the catheter. A further significant increase in the incidence of UB occurs when after an epidural procedure complicated by a radicular pain, bupivacaine is injected through the catheter (figure).

DISCUSSION: As expected, radicular pain during needle and/or catheter insertion increases the risk of inadequate unilateral pain relief. A more interesting finding is that injection through the catheter rather than through the needle is less reliable in producing effective bilateral analgesia. As previously suggested (2), we believe that our data support the hypothesis that any deviation of the needle tip from midline when entering the epidural space leads to a further lateral position of the catheter, increasing the risk of unilateral blockade.

References:

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