

TITLE: LIDOCAINE 45 mg IN THE EPIDURAL TEST DOSE IS NOT A MARKER OF INTRAVASCULAR INJECTION IN PARTURIENTS

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INTRODUCTION: Lidocaine 45 mg with epinephrine 15 mcg is the most commonly used epidural test dose (ETD). The primary role of lidocaine in this mixture is to rule out an unintentional intrathecal injection. Its use also as a marker of intravascular injection has been suggested. Lidocaine 100 mg i.v. has been shown to produce unmistakable symptoms (most commonly tinnitus) in male volunteers.

(1). This prospective single blinded study evaluates the efficacy of lidocaine 45 mg in the ETD as marker of intravascular injection in laboring patients.

METHODS: After institutional approval, twenty laboring patients gave informed consent. Maternal heart rate (MHR) was monitored via pulse oximetry and blood pressure, non invasively, every two minutes. A "dry" epidural catheter was placed with the patient in the sitting position. By sequential randomization ten patients entered the lidocaine group (LG) and ten, the control group (CG). The LG received lidocaine 45 mg i.v. diluted to 3 ml while the CG received normal saline 3 ml i.v. All the injections were made in the absence of uterine contractions and in the presence of stable vital signs. A blinded observer (anesthesiology resident) questioned the patients about the presence of metallic or funny taste, dizziness or lightheadedness and tinnitus. He then recorded the patient's answers and his opinion whether the patient received lidocaine or saline. Sensitivity and specificity of each symptom and the observer's clinical evaluation were then calculated.

RESULTS: Table 1 shows sensitivity and specificity of each symptom.

Analysis of those symptoms as markers of intravascular injection, alone or in combination, as well as the observer's overall clinical evaluation, did not reach clinical significance.

DISCUSSION: Epinephrine-free ETD have been suggested as a marker of intravascular injection in parturients, because epinephrine may cause undesirable reduction in placental blood flow. Studies have shown that chloroprocaine 100 mg (2) and lidocaine 100 mg (1) injected i.v. produce unmistakable symptoms in healthy male volunteers. However, in parturients, lidocaine 100 mg injected intrathecally may cause a high level of subarachnoid block and 2-chloroprocaine has the potential risk of neurotoxicity. Our results suggest that lidocaine 45 mg, which is the amount most commonly used in ETD, is not a reliable marker of intravascular injection. The analyzed symptoms demonstrated low sensitivity (<40%), as did the observer's clinical evaluation (20 % sensitivity, 2/10 true positive). We conclude that lidocaine 45 mg only cannot be used in epidural anesthesia as a marker of intravascular injection in parturients.

Table 1: Sensitivity and specificity of symptoms

Symptoms	Sensitivity	Specificity
Metallic or funny taste	20%	80%
Dizziness or lightheadedness	40%	90%
Tinnitus	20%	100%
Observer's clinical evaluation	20%	90%

REFERENCES

1. Roetman KJ, Elsanach JC: Anesthesiology 69:A669, 1988.
2. Grice SC et al: Anesthesiology 67:A627, 1987.

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TITLE: ANALYSIS OF BIRTH CRY: ITS RELATION TO ANESTHESIA AND MODE OF DELIVERY

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Cry sounds of the infant may provide clues as to its biologic state or levels of arousal. Maternal medications during labor may affect cry sounds, and can delay crying time. It has also been shown that pitch of the cry in stressed infants may differ from that of normal infants(1). Yet, little is known about the effects of the method of delivery and anesthesia on birth cry features. This study examined the relationship between the delivery process and birth cry parameters.

After institutional approval and parental consent, newborns delivered vaginally or abdominally at term following uncomplicated pregnancies were studied. The cries of newborns were recorded for the first two minutes at birth with a tape recorder and microphone on metallic tape. Epidural block using 0.25% bupivacaine for labor analgesia or 2% lidocaine with fentanyl for cesarean section was performed on parturients as clinically indicated. Umbilical arterial blood sample was obtained for pH measurement. Newborns whose blood pH was less than 7.20 were excluded from the analysis. The taped cries were analyzed for latency and frequency. The latency was defined as the time from delivery of the feet to the first cry (duration greater than one second). The peak frequency of the first three

cries was analyzed by Type 453 oscilloscope and a digital counter LDC-823S, and the averaged peak frequency was recorded. The latency and frequency were compared between newborns delivered vaginally and newborns delivered abdominally. In addition, comparisons were made between newborns born to mothers given epidural analgesia in labor and newborns who were delivered with the psychoprophylactic method of Lamaze.

Analysis of taped birth cries was obtained from 33 newborns (see table). The birth weight varied from 2665 to 4216 grams. The latency and peak averaged frequency of the birth cry in cesarean born newborns were not statistically different from newborns delivered vaginally. There were also no significant differences in the latency and the frequency between newborns born to mothers given epidural labor analgesia and newborns delivered with Lamaze method. We conclude that cry parameters at birth are similar regardless of the mode of delivery and the type of anesthesia given to mothers provided that the infant is term with normal birth weight, and has no perinatal asphyxia.

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Table: means \pm S.D.

	Latency(Seconds)	Frequency(Hertz)
Cesarean(n=12)	*7.0 \pm 8.0	+1307 \pm 463
Vaginal (n=21)	12.2 \pm 13.0	1112 \pm 449
epidural(n=12)	13.4 \pm 11.6	1147 \pm 426
Lamaze (n=9)	12.9 \pm 12.7	1068 \pm 470

*p=0.16, +p=0.26 compared with Vaginal group