

Title: EPIDURAL KETAMINE IMPROVES EPIDURAL LIDOCAINE ANESTHESIA DURING CESAREAN SECTION: A DOUBLE BLIND STUDY

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Introduction. Patient discomfort during cesarean under epidural anesthesia may require supplemental analgesics such as intravenous narcotics, diazepam or ketamine. (1) In one study, supplementation of epidural anesthesia for cesarean section with 2 % lidocaine has been reported to routinely require 65 to 80 mcg intravenous fentanyl (2). Epidural ketamine has been reported to have analgesic properties. (3) We report a double blind randomized study on the effect of adding epidural ketamine 0.1% to epidural lidocaine anesthesia during cesarean section.

Methods. Following approval of the Institutional Review Board, 45 healthy patients who were to receive epidural anesthesia for elective repeat cesarean section consented to this study. Ketamine 20 mg or saline (0.4 cc) was added to 20 cc of lidocaine 2% with 1:200,000 epinephrine in double blind fashion. Fifteen to twenty cc of the mixture was administered in fractionated doses. The sensory level was tested by pinprick to insure at least a T-6 level. Latency of anesthesia, interval between induction and delivery (IDI), Apgar scores were recorded. The most discomfort during cesarean was scored as follows: 0=severe, 1=moderate, 2=mild, and 3=none. Duration of the initial dose of anesthesia was measured from end of the epidural injection to the time any supplementary analgesic or anesthetic was administered. The statistical significance of differences between the two groups were determined by Student's T test.

Results. The addition of ketamine decreased the latency and the discomfort as well as increasing the duration of the anesthesia (see below).

One patient who received ketamine experienced blurred vision, which resolved within ten minutes without requiring medical treatment. No hallucinations, respiratory depression or other side effects were observed. There was no statistically significant difference in the Apgar scores, IDI, nor sensory level between the two groups.

Discussion. Epidural ketamine 0.1% and lidocaine 2% anesthesia is superior to lidocaine alone. The addition of epidural ketamine decreased the latency time and intraoperative patient discomfort. The more rapid onset of anesthesia due to ketamine may be especially useful in emergent situations. The duration that the patients required no other analgesics was increased. It is unlikely that the improved anesthesia are due to local anesthetic properties of ketamine. These local anesthetic properties of ketamine are only reported at much higher doses (4). There is no report to the authors' knowledge of epidural ketamine being used intraoperatively.

References.

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2. Cole CP, McMorland GH, Axelson JE and Jenkins LC. Epidural Blockade for Cesarean Section Comparing Lidocaine Hydrocarbonate and Lidocaine Hydrochloride. Anesthesiology 62:348-350, 1985.
3. Islas JA, Astorga J and Laredo M. Epidural Ketamine for Control of Postoperative Pain. Anesth Analg 64:1161-2, 1985.
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	ONLY EPIDURAL LIDOCAINE (n=21)	EPIDURAL KETAMINE AND LIDOCAINE (P) (n=24)	PERCENT INCREASE
SENSORY LEVEL (T)	5.3 ± 1.4	4.6 ± 1.4 (>.05)NS	- 13 %
IDI (min)	31.9 ± 7.4	28.0 ± 9.5 (>.05)NS	- 12 %
APGAR 1"	8.4 ± 1.2	8.5 ± 0.6 (>.05)NS	+ 1 %
APGAR 5"	9.0 ± 0.4	9.2 ± 0.4 (>.05)NS	+ 2 %
LATENCY (min)	18.5 ± 5.4	12.3 ± 5.7 (<.001)**	- 34 %
DISCOMFORT SCORE	2.1 ± 0.8	2.8 ± 0.4 (<.001)**	+ 33 %
DURATION (min)	83.5 ± 52.	141.3 ± 62. (<.01)**	+ 69 %

NS= not statistically significant

**= statistically significant