Does Higher Diluent Volume Improve Quality of Epidural-PCA Infusion Post Cesarean Section?

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INTRODUCTION: It has been shown that boluses of epidural fentanyl diluted in normal saline produced rapid onset and longer duration of analgesia for post C/S pain relief 1. In this randomized study, we sought to compare the effects of varying diluent volumes of fentanyl-bupivacaine-epinephrine administered by epidural-PCA infusion on quality of analgesia, dosage, and incidence of side effects.

METHODS: Following IRB approval and informed consent, 80 parturients for elective C-section were randomized in a double blinded study to 4 groups: group I (n=20) epidural-PCA infusion of fentanyl 6 mcg/mL with bupivacaine 0.03% and epinephrine 2 mcg/mL at rate of 5 mL/hr, group II (n=20) epidural-PCA infusion of fentanyl 3 mcg/mL with bupivacaine 0.015% and epinephrine 1 mcg/ml at rate of 10 mL/hr, group III (n=20) epidural-PCA infusion of fentanyl 2 mcg/mL with bupivacaine 0.01% and epinephrine 0.75 mcg/mL at rate of 15 mL/hr, group IV (n=20) epidural-PCA infusion of fentanyl 1.5 mcg/mL with bupivacaine 0.0075% and epinephrine 0.5 mcg/mL at rate of 20 mL/hr. Each patient received an initial infusion at a rate of 30 mcg/hr, and was allowed self administration of PCA 6 mcg boluses every 15 min as desired, 4 boluses were allowed in 1 hour. Pain intensity at rest was assessed by using a 10-point visual analog scale (0 = no pain, 10 = most severe pain).

Patients were also assessed for the incidence of any pruritus, facial pruritus, sedation, nausea, vomiting, backache, urinary retention, and uncomfortable uterine cramping. The severity of side effects was assessed using a 3-point scale (1 = mild, 2 = moderate, 3 = severe). Overall satisfaction with treatment was assessed using a 10-point visual analog scale (0 = no satisfaction, 10 = best satisfaction).

The data is given as mean ± SD. Analysis was done using ANOVA, Kruskal-Wellis, and Fisherâ€™s exact test where p<0.05 was considered significant.

RESULTS: The groups showed no difference with respect to age, height, weight, parity and gravity. Pain relief was satisfactory for all groups throughout the study but was better for group II and III than for group I and IV (p<0.001, ANOVA). The incidence of pruritus, sedation, or nausea for 48 hours did not differ among the groups. Transient lower extremity sensory loss which interfered with ambulation was seen only in group I (9 patients, p<0.001, Fisherâ€™s exact tests); however, there were no signs of orthostasis.
CONCLUSION: When compared to group IV, group II and III showed no improvement of diluted epidural fentanyl with bupivacaine for labor pain. Compared to group I, group II required a less need for fentanyl with time progression to treat pain. Sensory deficits and urinary retention seen in group I may be attributed to more concentrated bupivacaine. In summary, our study found the solution of 0.015% bupivacaine to be more efficient for epidural PCA post C-section pain.