Does Increasing the Concentration of Epidural-PCA Fentanyl for Labor Improve Analgesia without Effect to Neonate?

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Introduction: Epidural fentanyl 2mcg/mL with bupivacaine 0.015% and epinephrine 2mcg/mL required frequent rescue doses of 0.25% epidural bupivacaine for satisfactory labor analgesia, whereas less anesthetic was needed with sufentanil. This study analyzed whether increasing the concentration of less expensive fentanyl would provide adequate analgesia with less local anesthetic and without neonatal impact.

Methods: Seventy-five primiparae and seventy-five multiparae evaluated during labor and delivery (L&D) were divided into 3 groups. Patients received no systemic opioids and were randomized in a double-blinded design to groups with either 2, 4 or 6mcg/mL of fentanyl. All groups received 0.015% bupivacaine and 2mcg/mL of epinephrine. After a dose of 3mL 1.5% lidocaine and 5mcg/mL epinephrine they received a 12mL loading dose of the study solution. An infusion was started at 6mL/hr with PCA boluses of 2mL and a lockout time of 10min. For inadequate analgesia, up to 4 boluses of 5mL study solution were given 10min apart and infusion rate was increased by 2mL/hr up to 3 times. If analgesia was still inadequate (pain score > 5), up to 4 boluses of 5mL of 0.25% bupivacaine were given. Pain scores, side effects, and overall patient satisfaction were assessed hourly with a 10-point VAS (Visual Analog Scale). Values are mean ± SD. P value <0.05 was considered statistically significant.

Results: There were no differences among the groups regarding demographic data, outcome of L&D, instrumental delivery, infusion duration, pain scores, satisfaction scores, or side effects. Apgar scores did not differ among groups and was <7 at 1 min in 4 patients for primiparae and 1 patient for multiparae; Apgar scores were >7 for all patients at 5 min. Neonatal neuro-behavioral assessment total scores at 1 and 24 hrs were > 35 (max score = 40) for all infants. Infusion characteristics are shown in Table 1. Maternal and cord plasma concentrations of fentanyl upon delivery are depicted in Table 2.

Conclusion: Increasing the concentration of fentanyl did not impact the neonates or the outcome of labor and delivery. Increasing the concentration of fentanyl significantly decreased the bolus volume of study solution. However, total 0.25% bupivacaine required remained high.