The Effect of Neuraxial Analgesia on Fetal Head Malrotation: The Comparison of Intermittent Epidural Injection, Continuous Epidural Infusion, and Combined Spinal-Epidural Analgesia

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Introduction: The incidence rate of fetal head malrotation at delivery has been reported as ranging 2 and 13%. Though, it has been suggested, there are no reports, as we know of, having tested the hypothesis that the relaxation of muscles of the pelvic floor by neuraxial analgesia is a contributing factor for the fetal head malrotation. Since the degree of motor blockade by neuraxial analgesia depends on analgesic used and its regimen, here, we performed the prospective study and the statistical analysis to test whether the incidence of fetal head malrotation correlates to the Method of neuraxial analgesia and/or to the degree of relaxation of the pelvic floor muscles (and lower extremities which occur concomitantly).

Methods: Singleton, low risk term deliveries with vertex position were enrolled. Two hundred thirty eight women, 121 nulliparous and 117 multiparous, were randomly allocated to either 3 groups: intermittent epidural injection (INTER: n = 81), continuous epidural infusion (CONT: n=81), or combined spinal-epidural analgesia followed by continuous epidural infusion (CSEA: n = 76). In group INTER, parturients received 0.25% bupivacaine intermittently as their request during labor. In group CONT, parturients received 0.2% ropivacaine initially for top-up, followed by at 0.1% ropivacaine plus 2 µg / ml fentanyl at 8 ml / hr. In group CSEA, parturients received intrathecal 2.0 mg bupivacaine and 20 µg fentanyl initially, followed by epidural infusion with the same solution as group CONT. Rescue dose was given either 0.2% ropivacaine or 0.25% bupivacaine (group INTER only). Fetal head rotation, modified Bromage score, and visual analog scale of pain were recorded before, 30 min after analgesia, and at delivery. Maternal satisfaction for analgesia was asked within 24 h after delivery. Obstetric and fetal neonatal outcomes were also examined.

Results: Malrotation was found in 4, 6, and 8 cases in group INTER, CONT, and CSEA, respectively. There were no significant differences in the frequency of malrotation after neuraxial analgesia (5.0%, 7.4%, 10.5%, respectively. p = 0.416). Modified Bromage score and visual analog scale were similar among groups as a whole, though in nulliparous women group INTER showed more profound motor block (vs. CONT: p = 0.003, vs. CSEA: p = 0.000), higher visual analog scale at delivery (vs. CSEA: p = 0.017) and lower maternal satisfaction (vs. CONT: p = 0.017). Mode of delivery, forced delivery, time of delivery, Apgar score, umbilical arterial pH was similar among the groups.

Conclusions: The incidence of fetal head malrotation at vaginal delivery was not affected by the Method or the drug choice of neuraxial analgesia.