

**Title:** INCIDENCE OF POSTSPINAL HEADACHE AFTER CONTINUOUS SUBARACHNOID ANALGESIA FOR LABOR USING A 32 GA MICROCATHETER

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**INTRODUCTION:** Continuous subarachnoid block provides excellent analgesia for labor and delivery. Compared to epidural analgesia, it offers several advantages. Most important, approximately 1/10 of local anesthetic is needed and the block is of faster onset and more predictable (1). Since this technique has been associated with severe, incapacitating postspinal headache (2), it is seldom employed. The use of 25-26 GA spinal needles significantly decreases the occurrence of this complication in young patients (3). We report the incidence of postspinal headache when a 32 GA microcatheter (which passes through a 25-26 GA spinal needle) was used.

**METHOD:** Twenty six healthy parturients received continuous subarachnoid analgesia for labor and delivery. Soon after the patient was in active, painful labor, the spinal catheter was inserted 3 to 5 cm into the lumbar subarachnoid space. This was accomplished through a 26 GA spinal needle inserted via a paramedial approach. After intravenous hydration with one liter of crystalloid, 1.25 mg (0.5 ml of 0.25%) isobaric bupivacaine was injected intrathecally; 10-15 minutes later, if the analgesia was not satisfactory, another 1.25 to 2.5 mg (0.5-1 ml) of the same local anesthetic solution was injected and this was repeated whenever pain reoccurred. A ten point rating scale was used to evaluate

pain intensity. Pain decreased from an average of 8.8 (range 6-10) points before to 2.4 (0-5) after the subarachnoid block. The single dose of bupivacaine was 2.4 (1.25-3.75) mg and analgesia from a single bolus lasted 48 (16-108) min. Analgesia was maintained for a total time of 262 (46-620) min.

There were no significant changes in the physiologic parameters of either the mother or the fetus. The patients were followed for four days postpartum for evaluation of eventual complications.

**RESULTS:** Three patients developed mild to moderate orthostatic headaches which were not incapacitating and were treated with analgesics and an increase in fluid intake. In two of the patients the headaches resolved within three days. The third patient, discharged from the hospital still with a mild headache, developed a fever soon thereafter and subsequently underwent a diagnostic lumbar puncture in the emergency room. Meningitis was ruled out, however, the headache became severe and the patient was successfully treated with an epidural blood patch.

**CONCLUSIONS:** An incidence of 11% of mild to moderate non-incapacitating orthostatic headache was noted in this group of patients. This is not significantly different from the 8% incidence of mild to moderate headache reported by our parturients after epidural block (unpublished data).

**References:**

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**NEURONAL OSCILLATIONS IN AUDITORY EVOKED POTENTIALS INDICATE WAKEFULNESS DURING CESAREAN SECTION**

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Neuropsychological and neurophysiological investigations indicate that the underlying framework of adequate sensory information processing is a 30-40 Hz oscillatory brain mechanism, which also can be observed in midlatency auditory evoked potentials (MLAEP). Since high incidence of stimuli perception and wakefulness is a well-known phenomenon during Caesarean section under general anaesthesia it was studied if auditory evoked 30-40 Hz oscillations correlate with intraoperative wakefulness during this surgical procedure. After institutional approval and informed consent, 21 patients were selected for elective Caesarean section. Anaesthesia was induced with thiopentone (5mg/kg b.w. i.v.) and maintained with thiopentone bolus injection (1-2mg/kg b.w. i.v.) and O<sub>2</sub>/N<sub>2</sub>O 1:1 according to clinical signs of adequate anaesthesia. After delivery, a balanced anaesthetic technique using fentanyl, enflurane and N<sub>2</sub>O in O<sub>2</sub> 1:1 was employed. Clinical signs of intraoperative wakefulness were spontaneous movements of the limbs, mimics, eyeopening, wakefulness after auditory stimulation (tape A: crying baby, tape B: classical music), one hour and 24 hours postoperatively reported dreams, hallucinations and detailed reports about intraoperative events. Auditory evoked potentials were recorded on-line before and during general anaesthesia, during the entire surgical procedure. Latencies of the peaks V, Na, Pa were measured. Employing Fast-Fourier transform analysis, corresponding power spectra were calculated to analyse energy portions of AEP's frequency components. Spontaneous motoric movements occurred in 60% of the patients and did not cor-

relate with heart rate, blood pressure or other clinical signs of inadequate anaesthesia. Provoked motoric reactions were 4 times as often after presentation of tape A as after tape B. Dreams and hallucinations were reported by 43% of the patients 1 hour postoperatively and 9.5% 24 hours postoperatively. 9.5% perceived intraoperative surgical manipulations. In all awake individuals, peak-latencies were in the normal range. In the MLAEP a 30-40 Hz oscillation was energetically predominant. Under adequate levels of general anaesthesia the auditory evoked neuronal oscillation was suppressed and the 30-40 Hz leading frequency shifted to the low-frequency range. During spontaneous or provoked motoric reactions and in the patients who reported intraoperative dreams, hallucinations and perception of intraoperative events, MLAEP reinstated oscillatory waveform with a 30-40 Hz energy dominance (see Fig.). Auditory evoked 30-40 Hz oscillation correlates with clinical signs of intraoperative wakefulness. The results strongly support the assumption that the underlying framework of sensory information processing is a stimulus-dependent oscillatory brain mechanism. MLAEP monitoring during general anaesthesia is a promising method to uncover inadequate suppression of sensory information processing and inadequate anaesthesia.

