Hearing Loss After Spinal Anesthesia; A Comparison Between a 22G Quincke Needle and a 22G Whitacre Needle.

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Introduction. Both the incidence of post dural puncture headache (PDPH) and the incidence of postspinal hearing loss have been correlated to the size of the needle used for dural puncture. This association suggests that cerebrospinal fluid (CSF) leakage plays a causative role in the occurrence of decreased hearing after dural puncture. Since CSF leakage is related not only to the size but also to the shape of the spinal needle tip, we aimed to determine whether the incidence and the degree of hearing impairment in patients after spinal anesthesia is related to the shape of the needle used for dural puncture.

Methods. Patients scheduled for orthopedic surgery were randomly assigned to receive spinal anesthesia using either a 22G Quincke needle (n=18) or a 22G Whitacre needle (n=17). After an IV preload of 500 ml of Ringer solution, a single dural puncture was performed at the L2-3 or at the L3-4 interspace and 4 ml of isobaric bupivacaine 0.5% was administered. When using the Quincke needle, the bevel of the needle was inserted parallel to the dural fibers. Blood pressure was measured before injection and 2, 5, 10, and 15 minutes after injection. Patients were assessed for segmental level of analgesia (by pin-prick method) at 5, 10, and 15 minutes after injection. Audiometry was performed one day before as well as two days after surgery. The audiometrist and the patient were not aware of the type of needle used. Data were statistically analysed using non-parametric tests for unpaired observations and the Chi-square test where appropriate.

Results. There were no differences in demographic data between the two groups. The mean age in the 22G Quincke needle was 47.5 (SEM 2.9), the mean age in the 22G Whitacre group was 50.8 (SEM 3.8). Both groups did not differ with regard to the level of segmental analgesia and hemodynamic changes. The change in hearing level was significantly different between the two groups at 125, 250 and 2000 Hz (Fig). In the 22G Quincke group six patients (33%) experienced a decrease of hearing level of 10dB or more at two or more adjacent frequencies and one of these patients as well as one other patient in this group also had PDPH, requiring an epidural bloodpatch. In the 22G Whitacre group neither a hearing loss of 10 dB or more at two or more adjacent frequencies nor PDPH did occur (P<0.01 for intergroup difference in hearing loss).

Discussion. These data strongly suggest that the shape of the needle used for dural puncture affects the incidence and degree of hearing loss after spinal anesthesia. The findings may be explained by a reduction in CSF leakage after use of the pencil point Whitacre needle as compared to the Quincke needle.