Title: FENTANYL AND MORPHINE EFFECTS ON INTRAOPERATIVE SOMATOSENSORY CORTICAL EVOKE POTENTIALS

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Introduction. Somatosensory evoked potentials (SSEP) are used to assess spinal cord function during spinal surgery. Since anesthetics can affect spinal cord function, we studied and compared the effects of fentanyl (Fe) and morphine (MS) on SSEP.

Method. Twenty-three patients, 12-45 years of age, ASA I, with idiopathic scoliosis scheduled for reconstructive surgery of the spine were studied after approval by the Institutional Review Board. None had any neurological problems. Preoperative medication consisted of sevoflurane 2 mg/kg and alcuraline 0.05 mg/kg IM 90 minutes prior to surgery.

Baseline averaged SSEP were obtained by stimulating both median nerves at the wrist and both posterior tibial nerves at the ankle. The resulting somatosensory response was detected by subdermal electrodes placed over the contralateral cerebral cortex. Averaged SSEP was computed by averaging the individual responses to 64 monopolar, constant current square wave pulses of 250 μsec duration and up to 20 milliamperes of voltage.

After appropriate hydration and measurement of baseline SSEP, 14 patients (Group Fe) received an initial bolus of Fe (2.5 μg/kg) while 9 patients (Group MS) received an initial bolus of MS (0.25 mg/kg). Three mg/kg of thiopental and 0.1 mg/kg of pancuronium were used for induction and intubation. Average SSEP was computed by averaging the individual responses to 64 monopolar, constant current square wave pulses of 250 μsec duration and up to 20 milliamperes of voltage.

Results. One. When used in comparable doses (Fe 1 μg = 100 μg MS) both narcotics caused a similar increase in latency (3 ± 1 msec) of the N1 component, a moderate increase (5 ± 2 msec) of the P1 component, and a marked increase in the N2 component (> 5 msec) compared to preinduction values (Table). 2. Peak-to-peak amplitudes of the P1, N2, P2 complex varied greatly among patients using the same agent indicating that measurement of absolute amplitude has little significance in monitoring the effects of anesthetics.

Discussion. We found opioid-N2O-relaxant anesthesia to be well suited for monitoring during spinal surgery. Intermittent boluses adversely affected the interpretation of SSEP records and the conduct of smooth anesthesia. Continuous infusion compared to bolus administration produces a more predictable and stable suppression of the SSEP, better adjustability of analgesic levels, an easy repeatable wake-up test and a smoother immediate postoperative course. Regardless of the narcotics used, there is a predictable increase in latency and a variably decrease in amplitude. This variability is more pronounced with fentanyl probably as a function of its lipophilic nature.

Conclusion. Both narcotics in equipotent dosages produce similar changes in SSEP latency and highly variable changes in amplitude.

References.

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<tr>
<th>No. of Patients</th>
<th>N1 (msec ± SE)</th>
<th>P2 (msec ± SE)</th>
<th>N2 (msec ± SE)</th>
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<tr>
<td>MS N=6</td>
<td>+3±1</td>
<td>+5±2</td>
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<td>Fe N=11</td>
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<td>+5±2</td>
<td>&gt;+5</td>
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