Title: A POSTOPERATIVE RECOGNITION TEST AFTER BALANCED ANESTHESIA

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Introduction. Previous studies suggest that the ability to process auditory information during general anesthesia with isoflurane, nitrous oxide and diazepam may not be totally suppressed.[1] The purpose of this study was to determine the effect of fentanyl, nitrous oxide and diazepam administration on the frequency of postoperative word recognition. Objective evaluation of recognition memory in this study consisted of intraoperative word presentation and subsequent postoperative testing for these words with verbal and visual cues.

Methods. Approval was obtained from the local Internal Review Board. Thirty-five ASA I-III adult patients scheduled for elective surgery at the Veterans Administration Medical Center and Humana Hospital University in Louisville, KY, were studied with informed consent. A randomized, double-blind study with a standardized intraveneous anesthetic premedication and induction consisting of glycopyrrolate, 0.2 mg; diazepam, 0.07 mg/kg; d-tubocurarine, 3 mg; and thiopental, 6 mg/kg was used. Intubation was facilitated by succinylcholine, 2 mg/kg IV. This was followed by a 6 mcg/kg IV loading dose of fentanyl, a continuous infusion at a rate of 1 mcg/kg/hr IV, N_2O, 60% and O_2, 40%. Sustained increases (>1 min) in systolic blood pressure greater than 20% of the preoperative value were treated with a 1 mcg/kg IV bolus of fentanyl. Small additional doses of thiopental, lidocaine and diazepam were given to patients exhibiting movement in some cases. Muscular relaxation was maintained with a loading dose of atracurium, 0.2 mg/kg IV followed by continuous infusion of 0.2 mg/kg/hr adjusted to maintain the electrically evoked electromyographic potential integrated amplitude (EEMG) of the adductor pollicis muscle at approximately 20% of the prerelaxant reference. Intraoperative monitoring included blood pressure, electrocardiogram, surface electromyography of the facial muscle measured on the forehead, EEMG, quantitative electroencephalography, temperature, inspired oxygen and capnography. Following the initial surgical stimulus, a 15-min tape recording containing either repetitions of 6 test words (experimental group) or 6 nonsense words (control group) was presented. On the day after their surgery, patients were asked to choose the 6 words most familiar to them from a list of 36 uncommon words that included the test words. A tape recorded message instructed the patients and pronounced each of the words. The selection frequency of each of the 6 test words (presented to the experimental group) was compared in the 2 groups by Student's t-test.

Results. No significant differences were found between groups on postoperative choice of the 6 test words. Eight patients were excluded: 3 for technical problems with the tape recorder, and 5 for receiving additional thiopental or diazepam during the tape recording. The mean dose of diazepam given to the experimental group was 0.08 mg/kg IV (0.07-0.16) and for the control group was 0.09 mg/kg IV (0.07-0.14). Intraoperative recall may have occurred in one patient, however, she could not be sure whether the statement she heard was made intraoperatively or postoperatively.

Discussion. There was no evidence of postoperative recognition of words presented intraoperatively during fentanyl/nitrous oxide/diazepam anesthesia in contrast to a previous study where an inhalational agent, isoflurane, was used. Methodological differences between this and the previous study may in part explain the difference in results; however, these were not substantial enough to postulate this as the major contributing factor. Although postoperative recall has been reported with the use of high-dose fentanyl-O_2 techniques[2], i.e. 90 mcg/kg IV, it appears that fentanyl in relatively low doses supplemented with nitrous oxide and diazepam alter recognition memory in a way that might not be expected from any single agent in these doses, when used alone. Differences in somatosensory evoked potentials between opioids and inhalational anesthetics may be neurophysiologic evidence that explain why functions of memory are differentially affected by these agents.[3] In conclusion, this study and the previous one support the idea that recognition memory may be affected differently by opioids or inhalational anesthetics.

References.
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