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Title: BEST GENERAL ANESTHETIC AGENT FOR MORBIDLY OBESE?

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The optimum anesthetic agent for morbidly obese patients has been the source of both concern and conjecture<sup>1,2</sup>, but the results of a comparative study have not been reported. A randomized prospective study was designed to compare the relative clinical effectiveness of nitrous oxide/pancuronium combined with fentanyl (Group 1), with enflurane (Group 2), or with halothane (Group 3) as general anesthetics for morbidly obese patients.

**Methods:** After approval by the Human Subjects Committee, patients scheduled for elective gastric stapling and who agreed to participate, were randomized to one of three general anesthetic groups. End-tidal anesthetic (enflurane, halothane) concentrations were determined by gas chromatography for calculation of anesthetic dose (MAC hrs). Comparisons recorded among the groups were: 1) attention and concentration (measured by digit-span test), 2) time to opening eyes on command and time to extubation (both measured from the last skin stitch), 3) ventilation time postop, 4) recovery room (RR) time, 5) recovery room admission temperature, 6) amount of meperidine given in the RR and amount given over the first 24 hours. In addition, arterial blood gases were compared on  $FiO_2 = 0.4$  in the RR and at 24 hours postop. Analysis of variance and the Student *t*-test were used to make the statistical comparisons with significance set at  $p < .05$ .

**Results:** Sixty-seven patients, twelve male and fifty-five female, were studied with characteristics as follows (mean,  $\pm$  SE): age,  $38 \pm 1$  years; weight,  $126 \pm 3$  kg; height,  $166 \pm 1$  cm. Random distribution was as follows: Group 1 -- N = 20, Group 2 -- N = 24, Group 3 -- N = 23. Time to opening eyes on command was significantly less for the fentanyl group ( $3.0 \pm 0.7$  min.) than for either enflurane ( $13.2 \pm 1.9$  min.) or halothane ( $17.4 \pm 2.9$  min.). However, time to extubation was similar among groups (fentanyl,  $16.2 \pm 7.4$  min.; enflurane,  $15.2 \pm 1.6$  min.; and halothane,  $21.6 \pm 5.8$  min.) (Figure). Additionally, attention and concentration scores were unable to differentiate among groups comparing preoperative (control) to either discharge from the RR or 24 hours postop. Only one patient (Group 3) required RR mechanical ventilation (2 hrs). Recovery Room admission temperature and total RR time were not significantly different among groups. Meperidine requirements for pain relief in the RR and total dose over the first 24 hours were not significantly different among groups. Finally, no significant difference was noted in arterial blood gases ( $FiO_2 = 0.4$ ) among the three groups when measured either in the RR or 24 hours postoperatively.

**Discussion/Conclusions:** Despite the fact that volatile anesthetics are fat soluble, there is no clinical evidence to indicate that the obese patient will store more of the agent in adipose tissue and therefore take longer to wake up. There is also no evidence to indicate that the narcotics given intraoperatively during a nitrous/narcotic case will

result in a reduced requirement for narcotics postoperatively. Although patients given nitrous/narcotic anesthesia respond to verbal command earlier (i.e., open eyes), extubation time is not statistically different between balanced and volatile anesthetic techniques. Considering early (24-hour) postoperative outcomes, there is little to commend one general anesthetic technique over another in morbidly obese patients. The clinical effectiveness of inhalational volatile anesthesia is no different from that of balanced anesthesia.

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#### REFERENCES:

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2. Hamm CW, Koehler LS: The implications of morbid obesity for anesthesia. *Anes. Rev.* 6:29-35, 1975.

