

A330

TITLE: EFFECT OF NITROUS OXIDE ON SURGICAL CONDITIONS DURING LAPAROSCOPIC CHOLECYSTECTOMY

AUTHORS: E. Taylor, M.D., R. Feinstein, M.D., N. Soper, M.D., P.F. White, Ph.D., M.D.

AFFILIATION: Department of Anesthesiology, Washington University, St. Louis, MO

Nitrous oxide (N₂O) can expand bowel gas and might adversely effect surgical conditions during laparoscopic cholecystectomy. Published descriptions of anesthetic techniques for these procedures have avoided the use of N₂O.¹ The purpose of this double-blind, placebo-controlled study was to determine the effects of N₂O on the surgical conditions during laparoscopic cholecystectomy.

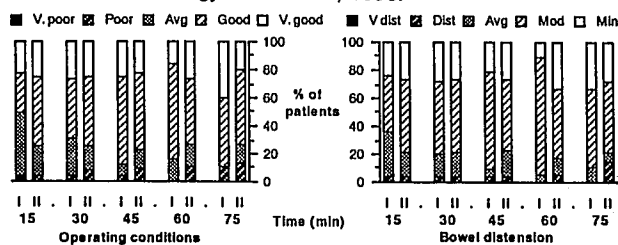
50 consenting ASA I-III patients, ages 18-80, were randomized to one of two treatment groups according to an IRB-approved protocol. All patients were premedicated with midazolam, 2 mg iv. Anesthesia was induced with fentanyl 1.5 µg·kg⁻¹, thiopental 4-6 mg·kg⁻¹, and a non-depolarizing muscle relaxant. Maintenance of anesthesia consisted of Isoflurane, 0.5-3%, with either 70% nitrous oxide (Group I) or air (Group II) in oxygen. Prior to the start of the operation, the surgeon was asked to estimate the degree of difficulty anticipated in performing the procedure (using a scale from 1=extremely difficult to 5=extremely easy). During the procedure, the operating surgeon was asked to evaluate both "overall operating conditions" and "bowel distension" at 15 min intervals using a similar 5-point scale. At the conclusion of the case, the surgeon was asked whether they thought N₂O or air had been administered during the case. Patient's completed 100 mm visual analog scales (VAS) for nausea (with 0=none to 100=severe), prior to the operation and at the time of discharge from the PACU. Data were analyzed using analysis of variance, Student's t-test and Chi-square test, with p-values <0.05 considered statistically significant (means ± S.D.).

Treatment groups I and II were comparable with respect to age (50 ± 16 vs 48 ± 15 yr), weight (78 ± 19 vs 76 ± 17 kg), sex distribution (M:F ratio 6:19 vs 5:20) and initial estimate of difficulty (3.4±0.8 vs 3.5±0.7). The overall surgical conditions and intraoperative bowel distension were similar in the two groups (figures). The duration of surgery (72 ± 23 vs 82 ± 39 min), length of stay in the PACU (72 ± 27 vs 73 ± 19 min), and requirements for antiemetic therapy (26 vs 53%) were comparable in Groups I and II, respectively. Nausea scores upon discharge from the PACU were also similar (25 ± 27 vs 17 ± 22 mm). The surgeons were able to correctly determine whether or not N₂O had been administered only 44% of the time.

In conclusion, the use of N₂O has no apparent effect on the operating conditions. Similarly, adjunctive use of N₂O did not increase the incidence of emetic sequelae or prolong the PACU stay. There was no apparent benefit in avoiding N₂O during laparoscopic cholecystectomy.

References

1. Anesthesiology 73:1268-70, 1990.



A331

TITLE: MINIMUM ALVEOLAR CONCENTRATION FOR DEEP EXTUBATION (MAC_{Dex}) USING ISOFLURANE.

AUTHORS: G.Neelakanta M.D., J.Miller M.D., C.Anderson M.D.
AFFILIATION: UCLA Department of Anesthesiology, Los Angeles CA 90024

Deep Extubation is frequently employed in patients undergoing intraocular surgery and patients with reactive airway disease. Determining the adequate depth of anesthesia for deep extubation is clinical and requires experience. Minimum Alveolar Concentration (MAC) value of an anesthetic affords an estimate of the relationship between the alveolar concentration and the response to surgical incision. Utilizing methods similar to those used to obtain MAC we have attempted to determine the MAC for deep extubation using Isoflurane. We have defined MAC for Deep Extubation (MAC_{Dex}) as the Minimum Alveolar Concentration at which 50% of patients are extubated without coughing, bucking or movement within 1 min of extubation.

After Institutional Human Subjects Protection Committee approval and Informed Consents from the parents 16 ASA I children aged between 3 and 9 were studied. No pre medications were given. Anesthesia was induced with Halothane, N₂O and O₂. Intubation was performed under deep Halothane except in 3 cases where Vecuronium was used. Anesthesia was maintained using O₂ and Isoflurane. No other drugs were given. At the end of surgery neuromuscular blockade was reversed where vecuronium was used and spontaneous ventilation was established. A predetermined end tidal Isoflurane concentration was achieved and maintained at steady state for at least 10 mins using mass spectrometry and endotracheal extubation was then performed. Deep extubation was termed satisfactory when extubation was not associated with coughing, bucking or any movement on extubation. The patients were studied by modified Dixon's up and down method with increments of 0.1% Isoflurane¹.

RESULTS: The results are plotted as shown in diagram. The MAC_{Dex} for Isoflurane is calculated as 1.3%.

DISCUSSION: Unintended coughing or bucking during attempted deep extubation in patients during intraocular surgery or in patients with reactive airways can be hazardous. Commonly inspired concentrations of volatile agent are increased prior to deep extubation. IV Lidocaine 2 mgs/kg given 1-2 mins prior to deep extubation has also been used^{2,3}. In this study we have established an estimate of alveolar concentration of Isoflurane necessary for deep extubation in 50% of children aged between 3 and 9 years. This is 1.3%. MAC for deep intubation for Halothane and Enflurane has been studied by Yakaitis et al^{4,5} and was about 1.3 times the MAC. However MAC for deep intubation using Isoflurane has not been studied. It appears that the depth of anesthesia required for deep extubation is lower than for deep intubation.

References: 1. Dixon WJ Statistics in Endocrinology MIT press; 251-264, 1967. 2. Anesth Analg 57:506-507 1978. 3. Acta Anesthesiol Scan 27:111-112 1983. 4. Anesthesiology 47:386-388, 1977. 5. Anesthesiology 50: 59-61, 1979.

