

## EVALUATION OF INTRAVENOUS PROPOFOL ANESTHESIA AND TRADITIONAL INHALATIONAL ANESTHESIA IN MASTOID SURGERY

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### INTRODUCTION

The total intravenous anesthesia (TIVA) due to advent of Propofol for both induction and continuous intravenous maintenance of anesthesia avoids local & global pollution as seen in inhalation anesthetic agents<sup>1</sup> and allows rapid recovery of consciousness.<sup>2</sup> The intravenous anesthesia is the latest concept of balanced anesthesia, which obviates in need for inhalational agents<sup>3</sup> like halothane & isoflurane. Propofol is good for both induction and maintenance of Anesthetic depth and also less of health hazards as occur in inhalational agents.<sup>4</sup> Studies have shown that propofol maintain cerebral and spinal cord blood flow autoregulation in experimental animals<sup>5</sup> and abolishes the metabolic endocrine stress reaction better than inhalational agents.<sup>6</sup> The anaesthetic gases used for maintenance of anaesthesia have significant health hazard. Prolonged exposure to anaesthetic gases lead to drowsiness and blunting of reflexes of operating room (OT) personnel. Nitrous oxide is green house gas and can also contribute to ozone layer depletion.<sup>7</sup> The main purpose of this study is to evaluate the TIVA (Propofol) with inhalational anesthetic agent (Halothane) in Mastoid Surgery.

### MATERIAL AND METHODS

The study was conducted between June 2009 and May 2011 at Kesar SAL medical college, Ahmedabad, India. After obtaining the informed consent from patients sixty Adult American Society of Anesthesiology (ASA) Grade-I and Grade-II, who have randomly taken and divided into two Groups i.e. Group-I and Group-II for undergoing routine mastoid

surgery. All patients were given injection glycopyrrolate (2 mcg) intramuscularly, half an hour before surgery. In group-I (study group) Intravenous Anesthesia Propofol 200 mg. (20 ml.) was given for induction and was maintained on infusion drip of propofol with oxygen and nitrous oxide by intubation with muscle relaxant succinyl choline 2 mg/kg body weight. In group - II (control group) inhalational agents halothane was used after inducing the patient with thiopentone 4 mg/kg body wt & maintained on halothane, oxygen and nitrous oxide by intubation with muscle relaxant succinyl choline in the dose of 2 mg/kg body weight. In both the groups injection fentanyl (2 mcg/kg) was given for analgesia. Heart rate, non invasive blood pressure, ECG, & pulse oxymeter were used for monitoring the vitals of patients during intra operative periods. The consumed dose of propofol & halothane were noted. The two groups were compared in regards to vitals, recovery time, post operative nausea and vomiting (PONV) and cost of propofol/halothane. The collected data were analyzed manually with appropriate statistical tests.

### OBSERVATIONS

The groups are comparable in age, weight, sex and duration of surgery of patients. The heart rate in both the groups increased following induction and incision. Intra-operatively the heart rate remained 20% below baseline value in the study group (propofol). However, in the inhalational group patients the heart rate was almost same as before induction. The incidence of hypotension (mean BP < 80 mmHg) was almost same in both the groups being (5 out of

30 patients) in intravenous group and (4 out of 30 patients) in the inhalation group.

**Table 1:** Comparison of surgical field conditions

Field conditions	Study group (n=30)	Control group (n=30)	p value (95% C.I.)
Acceptable (good + satisfactory)	22 (73.33%)	12 (40%)	0.006
Not acceptable (fair + unsatisfactory)	08 (26.66%)	18 (60%)	0.006

The quality of surgical field as stated by surgeon was acceptable 22/30 (73.33%) patients in study group as compared to 12/30 (40%) patients in control group which is statistically significant ( $p < 0.006$ ) at 95% confidence interval (C.I.).

**Table 2:** Post operative incidence of nausea and vomiting

Post operative nausea and vomiting	Study group (n=30)	Control group (n=30)	p value (95% C.I.)
Present	06 (20%)	15 (50%)	0.01
Absent	24(80%)	15(50%)	0.01

In the post operative period (6 hrs observation) only 20% of patients of intravenous group (propofol) complained of nausea and vomiting as compared to 50% of patients of inhalational group which is statically significant ( $p < 0.01$ ). The recovery profile was adjudged by time to eye opening, extubation and head lift. Patients were asked about orientation to time, place and person. The findings were similar in context to in the recovery time between intravenous and inhalational group, however patients in propofol group were clear headed at awakening and were better oriented to place than inhalational group.

## DISCUSSION

Present study showed that statistically significant superior surgical field ( $p < 0.006$ ) among propofol group. Pavlin et al<sup>8</sup> and Eberthart et al<sup>9</sup> also demonstrated superior surgical field with propofol in sinus surgery. This may be due to steady state plasma level of propofol achieved by continuous i.e. infusion providing relatively low BP, resulting into less blood loss and lesser surgical field congestion<sup>10</sup>. In current study, during the post operative period (6 hours) only 20% of patients of intravenous group complained of nausea and

vomiting as compared to 50% of patients of inhalational group (statistically significant,  $p < 0.01$ ), similar observation also found by L D Mishra, et al in his study.<sup>11</sup> Propofol appears to possess antiemetic property that contributes to lower incidence of emetic sequels after general anesthesia. In fact, sub-anaesthetic dose of propofol (10 to 20 mg) has also been successfully used to treat nausea and vomiting in the early post-operative period. This is due to its antidopaminergic activity and depressant effect on chemoreceptor trigger zone.<sup>12</sup>

In conclusion total intravenous anaesthesia with propofol provides better recovery with clear headedness for early assessment of surgery, less PONV and eco-friendly. However, the cost of TIVA (propofol) was more than three times as compared to inhalational anaesthesia.

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