Assessment of Efficacy of Comparison of Total I.V. Anaesthesia Using Propofol with an Inhalation Technique: A Hospital Based Study

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ABSTRACT

**Background:** Postoperative nausea and vomiting can be particularly problematic in ambulatory surgery as it may lead to delay in discharge or unscheduled admission to hospital. Additionally, it has been reported as the anaesthetic complication that is of most concern to patients. Multiple factors, including the anaesthetic agent delivered, are associated with an increased incidence of PONV and the optimal strategy for preventing PONV continues to be debated. **Aim of the study:** To assess the efficacy of comparison of total I.V. anaesthesia Using Propofol with an Inhalation Technique. **Materials & Methods:** The study was conducted in the department of anaesthesia of R.B.M. Hospital, Bharatpur, Rajasthan, India. For the study we selected patient’s admitting to the surgical ward of the medical hospital of the institute. A total of 16 patients were selected for the study. An informed written consent was obtained from each patient after explaining them the procedure and significance of the study verbally. The patients were randomly grouped into two groups, Group 1 and Group 2. Patients in Group 1 underwent anesthesia by IV procedure and patient’s in Group 2 underwent anesthesia by inhalation method. Patients were followed up and monitored for pain, sedation score, nausea and vomiting in the post-operative period for 48 h. **Results:** A total of 16 patients were included in the study. The patients were randomly grouped into Group 1 and Group 2. We observed that mean age of patients in group 1 was 36.31±12.21 years and in group 2 was 32.21±10.98 years. Number of male patients in group 1 was 5 and in group 2 were 4. We observed that majority of cases had Grade 0 and 1 operative area. **Conclusion:** The hat total I.V. anesthesia using Propofol offers no significant advantage over inhalation anesthetic technique.

**Key words:** inhalation anesthesia, IV anesthesia, Propofol, surgery

INTRODUCTION

Patients undergoing outpatient surgery require an anesthetic technique which allows rapid recovery and discharge from hospital. Barbiturates, benzodiazepines, antidepressants and general anaesthetic agents depress psychomotor performance in normal human subjects.[1,2] Propofol is redistributed rapidly and metabolized to pharmacologically inactive metabolites.[3] Psychomotor performance recovers earlier after Propofol anaesthesia compared with methohexitone used either as a single dose for dental procedures or in incremental doses to supplement regional anaesthesia.[4,5] Psychomotor recovery occurs earlier also after incremental Propofol and nitrous oxide compared with isoflurane and nitrous oxide used to maintain anaesthesia for short Gynaecological procedures.[6] A number of anaesthetic issues may delay discharge from hospital, including: cognitive recovery; cardiovascular recovery; pain; return to normal activity; and postoperative nausea and vomiting (PONV). Postoperative nausea and vomiting can be particularly problematic in ambulatory surgery as it may lead to delay in discharge or unscheduled admission to hospital.[7] Additionally, it has been reported as the anaesthetic complication that is of most concern to patients. Multiple factors, including the anaesthetic agent delivered, are
associated with an increased incidence of PONV and the optimal strategy for preventing PONV continues to be debated.\(^8\) Hence, we planned the current study to assess the efficacy of comparison of total I.V. anesthesia Using Propofol with an Inhalation Technique.

**METHODS**

The study was conducted in the department of anesthesia of R.B.M. Hospital, Bharatpur, Rajasthan, India. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. For the study we selected patient’s admitting to the surgical ward of the medical hospital of the institute.

Inclusion criteria
- ASA physical status I
- Age ranging from 16-60

Exclusion criteria
- History of bleeding disorders, major hepatic or renal or cardiovascular dysfunction
- patient on anti-coagulation therapy

A total of 16 patients were selected for the study. An informed written consent was obtained from each patient after explaining them the procedure and significance of the study verbally. The patients were randomly grouped into two groups, Group 1 and Group 2. Patients in Group 1 underwent total IV anesthesia with Propofol and patient's in Group 2 underwent anesthesia by inhalation method. The patients were admitted to the hospital and underwent surgical procedure as per guidelines. Patients were followed up and monitored for pain, sedation score, nausea and vomiting in the post-operative period for 48 h. For evaluation of the visibility of the operative field during surgery, the quality scale proposed by Fromm and Boezaart was used. The operative field conditions were assessed by the same operating surgeon as:
- Grade 0: No bleeding
- Grade 1: Slight bleeding – No suctioning of blood required.
- Grade 2: Slight bleeding – Occasional suctioning required. Surgical field not threatened.
- Grade 3: Slight bleeding – Frequent suctioning required. Bleeding threatens surgical field a few seconds after suction is removed.
- Grade 4: Moderate bleeding – Frequent suctioning required. Bleeding threatens surgical field directly after suction is removed.
- Grade 5: Severe bleeding – Constant suctioning required. Bleeding appears faster than can be removed by suction. Surgical field severely threatened and surgery impossible.

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student's t-test and Chi-square test were used to check the significance of the data. The p-value less than 0.05 was predetermined as statistically significant.

**RESULTS**

A total of 16 patients were included in the study. The patients were randomly grouped into Group 1 and Group 2. Table 1 shows the demographic data for both groups. We observed that mean age of patients in group 1 was 36.31±12.21 years and in group 2 was 32.21±10.98 years. Number of male patients in group 1 was 5 and in group 2 were 4. Table 2 shows the operative field conditions for both groups. We observed that majority of cases had Grade 0 and 1 operative area. Only one case from group 2 had grade 3 operative fields. No patient with grade 4 and 5 operative field was observed. On comparison, the results were observed to be statistically non-significant (p>0.05) [Fig 1].

**DISCUSSION**

In the present study we compared efficacy of comparison of total I.V. anesthesia using Propofol with an Inhalation Technique. We observed that both the techniques offer fair anaesthesia and no method is more efficacious than other. The results were statistically non-significant. The results were compared with previous studies and results were consistent with previous studies. Ankichetty SP et al compared total intravenous anesthesia using propofol with inhalational anesthesia using isoflurane for controlled hypotension in functional endoscopic sinus surgery. It was a prospective study in a tertiary hospital in India. Forty ASA physical status I and II adult patients (16–60 years) were randomly allocated to one of two parallel groups (isoflurane group, n = 20; Propofol group, n = 20). The primary outcome was to know whether total intravenous anesthesia using Propofol was superior to inhalational anesthesia using isoflurane for controlled hypotension. The secondary outcomes measured were intraoperative blood loss, duration of surgery, surgeon's opinion regarding the surgical field and the incidence of complications. The mean (±SD) time to
achieve the target mean blood pressure was 18 (±8) minutes in the isoflurane group and 16 (±7) minutes in the Propofol group. There was no statistically significant difference between these two groups in terms of intraoperative blood loss and operative field conditions. They concluded that controlled hypotension can be achieved equally and effectively with both Propofol and isoflurane. Total intravenous anesthesia using Propofol offers no significant advantage over isoflurane-based anesthetic technique in terms of operative conditions and blood loss. Aujla KS et al compared the surgical field using total intravenous anesthesia (TIVA) with propofol and inhalational anesthesia with isoflurane for FESS. Secondary outcomes such as intraoperative blood loss and the incidence of perioperative complications were also recorded. A total of sixty patients in the age group of 16-60 years with physical status American Society of Anesthesiologists Classes I and II, undergoing FESS were randomly divided into two groups of thirty each after taking informed consent and approval from the Hospital Ethics Committee. Thirty patients in Group I: received isoflurane-based inhalational anesthesia and other Thirty patients in Group II: were administered TIVA with Propofol. Various parameters were recorded and statistically analyzed. There was improved quality of surgical field at the end of surgery in the Group II as compared to Group I. Total blood loss during surgery and incidence of intraoperative complications were less in Group II as compared to Group I. This study concluded that in FESS, using TIVA with Propofol decreases blood loss and the incidence of complications during surgery in addition to providing good quality of surgical field.[8,10]

Marzban S et al used two different anesthesia techniques in functional endoscopic sinus surgery (FESS) and compared the amount of hemorrhage in the two groups. In a single-blind clinical trial, 44 patients with ASA class I and II candidate for FESS in Amir-Al-Momenin hospital in Rasht were entered the study and divided into two equal groups randomly. In both groups anesthesia was induced with Propofol, remifentanil and cis Atracurium and then, infusion of Propofol - remifentanil in the first group and isoflurane plus Remifentanil infusion in the second group was used for maintenance of anesthesia. Systolic blood pressure was maintained about 90 mmHg. Then on the basis of maximum allowable blood loss (MABL) formula, we calculated the percentage of hemorrhage. Finally, the patients’ hemorrhage was categorized into three groups (< 10%, 10-20%, > 20%). The surgeon’s satisfaction from surgical field was calculated according to the Visual Analogue Scale. There were meaningful differences between average of hemorrhage, and surgeon’s satisfaction. They concluded that the amount of hemorrhage in Propofol group was less than Isoflurane group and the field condition was better in Propofol group than the Isoflurane group. Santawat U et al compared recovery by clinical tests, the Perceptual Speed Test (PST) and the Ball Bearing Test (BBT), home recovery, side effects and satisfaction of anesthesia between total intravenous anesthesia using Propofol and inhalation anesthesia using halothane in day case surgery and to determine average cost per case of each technique from the provider’s perspective. Forty patients were randomly allocated into TIVA and IA groups. The anesthetic times were 42.1 +/- 26.47 minutes and 37.6 +/- 14.75 minutes respectively. Recovery was assessed by the time to orientation, sitting up, standing up and to success in obtaining baseline values of the PST & BBT. The observer was blinded to the anesthetic technique that the patient received. Recovery tests showed no difference between the two groups. The recovery times of TIVA and IA as assessed by the PST and BBT were 1.2 +/- 0.41 and 1.1 +/- 0.31 hour respectively. From a home questionnaire, both groups showed no difference in the first 2-3 hours of home recovery, incidence of side effects and satisfaction of anesthesia. When asked about the difficulty in getting home, no TIVA patients complained of sleepiness whereas 6/16 IA patient did. The average cost per case of TIVA and IA was 642.15 and 363.15 bahts respectively.[11,12]

**CONCLUSION**

Within the limitations of the study we conclude that total I.V. anesthesia using Propofol offers no significant advantage over inhalation anesthetic technique.

**REFERENCES**