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ORIGINAL ARTICLE

Comparison of total I.V. anesthesia using Propofol with an inhalation Technique: A Hospital Based Study

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ABSTRACT

Background: General anesthesia has undergone a vast number of improvements and modifications and even its recently modified form total intravenous anesthesia (TIVA; induction as well as maintenance of anesthesia with intravenous agents only) has undergone many improvements ever since its introduction into clinical practice. Till recently, inhalational agents have remained the routine choice for maintenance of anesthesia. **Aim of the study:** Tocomparetotal I.V. anesthesia using Propofol with an inhalation Technique. **Materials and methods:** The study was conducted in the Department of anesthesiology the medical institute.For the study, we selected patients admitting to the surgical ward of the hospital. The selected patients ranged between age of 16- 60 years and belonged to ASA physical status I and II. The patients with history of bleeding disorders, hepatic, renal, or cardiovascular disorders were excluded from the study. A total of 80 patients were selected for the study. **Results:** A total of 80 patients were included in the study. The patients were randomly grouped into Group A and Group B. We observed that mean age of patients in Group A was 37.14 years and in Group B was 39.78 years. Number of male patients in group A was 26 and in Group B was 22. Grade 0 operative field condition was seen in 11 patients of Group A and 14 patients of Group B. Grade 1 operative field condition was seen in 4 patients of Group A and 3 patients of Group B. Grade 2 operative field was seen in 3 patients of Group A and 2 patients of Group B. Grade 3 operative field was seen in 1 patient of Group A. **Conclusion**: We conclude that total I.V. anesthesia using Propofol offers no significant advantage over inhalation anesthetic technique.

Keywords: General anesthesia, inhalation anesthesia, propofol.

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INTRODUCTION:

Surgical patients exhibit changes in hemodynamic, metabolic and immune responses that are largely caused by an endocrine response to surgery and by cytokines. Unlike hormonal mediators, which are produced by specialized tissues and exert their influence predominantly by endocrine routes, cytokines are polypeptides or glycoproteins produced by diverse cell types. The development of anesthesia since its introduction has been erratic, long periods of stagnation being occasionally broken by improvement and advances. General anesthesia has undergone a vast number of improvements and modifications and even its recently modified form total intravenous anesthesia (TIVA; induction as well as maintenance of anesthesia with intravenous agents only) has undergone many improvements ever since its introduction into clinical practice. Till recently, inhalational agents have remained the routine choice for maintenance of anesthesia. One of the principle reasons is the availability of sophisticated delivery systems for volatile anesthetics, which allows the anesthetists to have a fine degree of control on the concentration administered to the patient.Hence, the present study was conductedto comparetotal I.V. anesthesia using Propofol with an inhalation Technique.

MATERIALS AND METHODS:

The study was conducted in the Department of anesthesiology the medical institute. 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 patients admitting to the surgical ward of the hospital. The selected patients ranged between age of 16- 60 years and belonged to ASA physical status I and II. The patients with history of bleeding disorders, hepatic, renal, or cardiovascular disorders were excluded from the study. A total of 80 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 A and Group B. Patients in Group A were treated under total IV anesthesia with Propofol and patients in Group 2 were treated by anesthesia with inhalation method. The patients were admitted to the hospital and the surgery was performed 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.
- Grade 3: Moderate bleeding – Frequent suctioning required.
- Grade 4: Severe bleeding – Constant suctioning required.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

RESULTS:

A total of 80 patients were included in the study. The patients were randomly grouped into Group A and Group B. **Table 1** shows the demographic data for both groups. We observed that mean age of patients in Group A was 37.14 years and in Group B was 39.78 years. Number of male patients in group A was 26 and in Group B was 22. **Table 2** shows the operative field conditions for both groups. Grade 0 operative field condition was seen in 11 patients of Group A and 14 patients of Group B. Grade 1 operative field condition was seen in 4 patients of Group A and 3 patients of Group B. Grade 2 operative field was seen in 3 patients of Group A and 2 patients of Group B. Grade 3 operative field was seen in 1 patient of Group A. No patient had grade 3 or grade 4 operative field in Group B. On comparison, the results were observed to be statistically non-significant (p>0.05) [**Fig 1**].

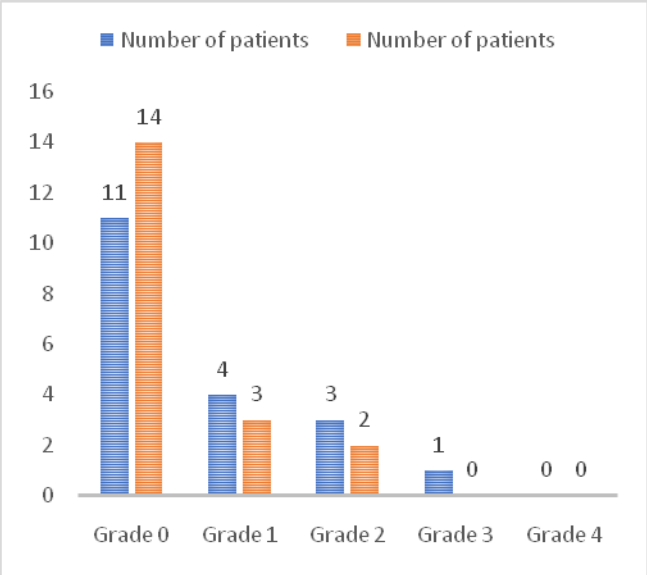
Table 1: Demographic data for the study groups

Parameters	Group A	Group B
Mean age (years)	37.14	39.78
Number of male patients	26	22
Mean height (cm)	156.74	161.32
Mean weight (kg)	61.26	63.14

Table 2: Operative field conditions for both groups

Grade	Number of patients		p-value
	Group A	Group B	
Grade 0	**11**	**14**	**0.19**
Grade 1	**4**	**3**	
Grade 2	**3**	**2**	
Grade 3	**1**	**0**	
Grade 4	**0**	**0**	

Figure 1: Operative field conditions for both groups



DISCUSSION:

Heid F et al compared the influences of inhalation anaesthesia (IA) and total intravenous anaesthesia (TIVA). Twenty rectal cancer patients undergoing open nerve-sparing total mesorectal excision (TME) were assigned to pIONM under either IA or TIVA. IA was maintained with sevoflurane and TIVA with propofol. The absolute EMG amplitude during pIONM increased to 1.20 µV for IA and 1.49 µV for TIVA. The relative EMG amplitude increase also was significantly lower for IA. They concluded that while both anaesthetic regimens proved useful for pIONM, TIVA with propofol may provide better signal quality than IA with sevoflurane.Fischer M et al studied the influence of TIVA and KA under normo- and hyperventilation on the blood flow velocity (BFV) and pulsatility of the middle cerebral artery (MCA). Two groups of 10 patients each undergoing craniotomy were investigated. Systolic and mean BFV, pulsatility index, mean arterial blood pressure, heart rate, and arterial CO2 tension were measured at four time intervals: (1) preoperatively; (2) 15 min after anesthesia induction under normoventilation, preoperatively; (3) 25 min after anesthesia induction under hyperventilation, preoperatively; and (4) 6 h postoperatively. There was a significant decrease in systolic and mean BFV combined with an increase in pulsatility index after induction of TIVA, while KA induction effected no significant change in cerebral hemodynamics. The subsequent hyperventilation caused a similar decrease in mean BFV and increase in pulsatility index in both groups. It was concluded that using the assumption that the diameter of the MCA is nearly constant, the reduction in BFV associated with an increase in pulsatility during TIVA is explainable as a decrease in CBF. By having a comparable influence on hemodynamics, the reduction in CBF with increase in cerebral vascular resistance seems to

make TIVA the more advantageous anesthesia technique for patients with reduced intracranial compliance.[7, 8]

Singh Bajwa SJ et al evaluated and compared two drug combinations of TIVA using propofol–ketamine and propofol–fentanyl and to study the induction, maintenance and recovery characteristics following anesthesia with these techniques. A case control study was conducted, which included 100 patients. A hundred patients between the ages of 20 and 50 years of either gender were divided into two groups of 50 each, and they underwent elective surgery of approximately 1 h duration. Group I received propofol–ketamine while group II received propofol–fentanyl for induction and maintenance of anesthesia. All the results were tabulated and analyzed statistically with student's unpaired t-test and chi-square test. Propofol–fentanyl combination produced a significantly greater fall in pulse rate and in both systolic and diastolic blood pressures as compared to propofol–ketamine during induction of anesthesia. Propofol–ketamine combination produced stable hemodynamics during maintenance phase while on the other hand propofol–fentanyl was associated with a slight increase in both PR and BP. During recovery, ventilation score was better in group I while movement and wakefulness score was better in group II. Mean time to protrusion of tongue and lifting of head was shorter in group I. it was concluded that both propofol–ketamine and propofol–fentanyl combinations produce rapid, pleasant and safe anesthesia with only a few untoward side effects and only minor hemodynamic effects.McKay RE 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 time to achieve the target mean blood pressure was 18 minutes in the isoflurane group and 16 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.[9, 10.]

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:

1. Kurt E, Cosar A, Bilgin F. Comparison of the combinations of propofol/ketamine, propofol/fentanyl and propofol/alfentanyl on the quality of induction, intubation, hemodynamics and recovery, for providing analgesia in TIVA. Minerva Anestesiol. 1990;56:817–9.
2. Gill SS, Wright EM, Reilly CS. Pharmacokinetic interaction of propofol and fentanyl: Single bolus injection study. Br J Anaesth. 1990;65:760–5.
3. Ghabash M, Matta M, Kehhaleh J. Depression of excitatory effects of propofol induction by fentanyl. Middle East J Anesthesiol. 1996;13:419–25.
4. Colucci D, Puig N, Hernandez-Pando R.. Influence of anaesthetic drugs on immune response: from inflammation to immunosuppression. OA Anaesthetics. 2013;1:21.
5. Arcaroli JJ, Liu N, Yi N, Abraham E.. Association between IL-32 genotypes and outcome in infection-associated acute lung injury. Crit Care. 2011;15:R138.
6. Kobayashi H, Huang J, Ye F, Shyr Y, Blackwell TS, Lin.. Interleukin-32 beta propagates vascular inflammation and exacerbates sepsis in a mouse model. PLoS One. 2010;5:e9458.
7. Heid F, Kauff DW, Lang H, Kneist W. Impact of inhalation vs. intravenous anaesthesia on autonomic nerves and internal anal sphincter tone. Acta Anaesthesiol Scand. 2015 Oct;59(9):1119-25.
8. Fischer M, Moskopp D, Nadstawek J, Ries F. Total intravenous anesthesia using propofol and alfentanil as compared to combined inhalation anesthesia reduces the flow velocity in the middle cerebral artery. A Doppler sonographic study. Anaesthesist. 1992 Jan;41(1):15-20.
9. Singh Bajwa SJ, Bajwa SK, Kaur J. Comparison of two drug combinations in total intravenous anesthesia: Propofol-ketamine and propofol-fentanyl. Saudi J Anaesth. 2010;4(2):72-9.
10. McKay RE, Bostrom A, Balea MC, McKay WR. Airway responses during desflurane versus sevoflurane administration via a laryngeal mask airway in smokers. AnesthAnalg. 2006 Nov;103(5):1147-54.