

Intraoperative Haemodynamic Parameters and Cost Effectiveness Between Propofol (TIVA) Based Anaesthesia and Sevoflurane (Inhalational) Anaesthesia at a Tertiary Care Hospital

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ABSTRACT

Background: The present study was conducted with the aim of comparing the haemodynamic variables and cost effectiveness between sevoflurane (inhalation) anaesthesia and propofol [total intravenous anaesthesia (TIVA)] based anaesthesia.

Materials & Methods: Evaluation a total of 50 patients was done. Recording of Complete demographic and clinical details of all the patients were done separately. All the patients were randomly and broadly divided into two study groups as follows: Group A: Sevoflurane group, and Group B: Propofol group. All surgical procedures were carried out in all the patients according to their respective study groups. Both the Sevoflurane and Propofol infusion were stopped at the end of surgery when the skin sutures were being applied. Continuous monitoring of hemodynamic variables was seen.

Results: Mean induction time among the patients of the Group A and group B was 49.5 seconds and 68.4 seconds respectively; the results of which were found to be statistically significant. Also, the intraoperative haemodynamic parameters consisting of heart rate and blood pressure were comparable between the two groups with no statistically significant

INTRODUCTION

Blood loss during surgery can be caused by a variety of variables, including but not limited to surgical and anaesthesia methods. Intraoperative bleeding has historically been reduced in a number of different methods. One of them is controlled hypotension, which is attained either alone or in combination with sodium nitroprusside or esmolol drips and anaesthetic drugs. However, this method has been linked to higher rates of morbidity and mortality. The patient is placed in the reverse Trendelenburg position, the nose is decongested, the neurovascular bundles are blocked, and a local anaesthetic with epinephrine is injected into the nasal mucosa to improve the surgical circumstances during ESS. Total intravenous (IV) anaesthesia (TIVA) with propofol has been linked in some studies to shorter operating times and lower perioperative hazards when compared to inhalational anaesthesia (IA).¹⁻⁴ Although sevoflurane was synthesized in the early 1970s,

difference. The actual cost of Sevoflurane 50 ml bottle was about 900 rupees while the cost of same volume of Propofol was around 600 rupees.

Conclusion: From the above results, it can be concluded that Sevoflurane costs more than the Propofol. However, hemodynamic effect of both is comparable.

Key words: Propofol, Sevoflurane, Anesthesia.

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it was not released for clinical use until the early 1990s. Nowadays, its pharmacodynamic and pharmacokinetic properties together with its absence of major adverse side effects on the different organ systems have made this drug accepted worldwide as a safe and reliable anesthetic agent for clinical practice in various settings.⁵ 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.⁶ Hence; under the light of above-mentioned data, the present study was conducted with the aim of comparing the haemodynamic variables and cost effectiveness between sevoflurane (inhalation) anaesthesia and propofol (TIVA) based anaesthesia. Deepak & Vinay Sharma. Haemodynamic Parameters B/w Propofol (TIVA) and Sevoflurane (Inhalational) Anaesthesia

MATERIALS & METHODS

The present study conducted with the aim of comparing the haemodynamic variables and cost effectiveness between sevoflurane (inhalation) anaesthesia and propofol (TIVA) based anaesthesia in Department of Anaesthesiology, Krishna Mohan Medical College & Hospital, Mathura, Uttar Pradesh, India. Evaluation a total of 50 patients was done. Recording of Complete demographic and clinical details of all the patients were done separately. All the patients belonged to the age range of 18 to 60 years and belonged to ASA Grade I and II. All the patients were randomly and broadly divided into two study groups as follows:

Group A: Sevoflurane group, and Group B: Propofol group. Overnight fasting was instructed to all the patients followed by premedication with Inj. Ranitidine in the preoperative room. All surgical procedures were carried out in all the patients according to their respective study groups. Both the Sevoflurane and Propofol infusion were stopped at the end of surgery when the skin sutures were being applied. Continuous monitoring of hemodynamic variables was seen. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Chi-square test and student t test was used for evaluation of level of significance.



Graph 1: Demographic variables

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Heart rate	Group A	Group B	p- value
Baseline	88.6	86.2	0.51
1 minute	80.1	79.4	0.23
5 minutes	77.5	78.3	0.35
10 minutes	78.9	80.7	0.18
20 minutes	79.1	78.3	0.27
30 minutes	78.4	77.9	0.91

Table 2: Com	parison of s	ystolic blood	pressure at	different time intervals

Systolic blood pressure	Group A	Group B	p- value
Baseline	134.5	135.4	0.45
1 minute	125.3	125.9	0.28
5 minutes	124.2	122.3	0.36
10 minutes	122.9	124.7	0.39
20 minutes	121.8	123.9	0.18
30 minutes	120.3	122.8	0.17

Table 3: Comparison of Diastolic blood pressure at different time intervals

Diastolic blood pressure	Group A	Group B	p- value
Baseline	90.4	89.2	0.28
1 minute	82.3	83.4	0.16
5 minutes	86.4	84.9	0.38
10 minutes	82.6	83.6	0.27
20 minutes	83.5	82.7	0.26
30 minutes	81.7	82.7	0.71

RESULTS

Out of 25 patients of group A, 12 patients belonged to the age group of 18 to 40 years while the remaining belonged to the age group of 41 to 60 years. Out of 25 patients of group B, 10 patients belonged to the age group of 18 to 40 years while the remaining belonged to the age group of 41 to 60 years. 72 percent of the patients of group A and 60 percent of the patients of group B were males. 80 percent of the patients of group A and 72 percent of the patients of group B belonged to ASA grade I. Mean induction time among the patients of the Group A and group B was 49.5 seconds and 68.4 seconds respectively; the results of which were found to be statistically significant. Also, the intraoperative haemodynamic parameters consisting of heart rate and blood pressure were comparable between the two groups with no statistically significant difference. The actual cost of Sevoflurane 50 ml bottle was about 900 rupees while the cost of same volume of Propofol was around 600 rupees.

DISCUSSION

The present study was conducted with the aim of comparing the haemodynamic variables and cost effectiveness between sevoflurane (inhalation) anaesthesia and propofol (TIVA) based anaesthesia. 80 percent of the patients of group A and 72 percent of the patients of group B belonged to ASA grade I. Mean induction time among the patients of the Group A and group B was 49.5 seconds and 68.4 seconds respectively; the results of which were found to be statistically significant. In a similar study conducted by Chaaban MR et al, authors compared blood loss during ESS between patients receiving TIVA with propofol and those receiving IA with sevoflurane. The mean (SEM) blood loss per hour in the TIVA group was 78.5 (14) mL/h, and in the IA group it was 80.3 (17) mL/h (P = .93). A post hoc subgroup analysis found that in patients with a Lund-Mackay score of 12 or lower, the propofol TIVA group had a lower rate of blood loss compared with the sevoflurane IA group (mean blood loss, approximately 18 mL/h vs approximately 99 mL/h). The anesthesiologist's numeric rating score was significantly higher (indicating greater ease of performance) in the IA group than in the TIVA group. There was no statistically significant difference in the surgical numeric rating score between the 2 groups.¹¹ Ahn HJ et al compared the surgical condition and the amount of intranasal bleeding between patients given sevoflurane/remifentanil (SR) and propofol/remifentanil (PR) anaesthesia. ASA I or II patients undergoing ESS were randomly assigned to group SR (n=20) or group PR (n=20). The extent of the preoperative surgical lesion was classified as high (>12) and low Lund-Mackay (LM) (≤ 12) scores according to the computed tomography findings. In the high-LM score patients, the median (1st/3rd guartiles) blood loss for the SR and PR groups was 135 (121/222) and 19 (8/71) ml h-1, respectively (P<0.01), and the mean (sd) of numeric rating scale (NRS) was 5.8 (2.3) and 2.3 (1.0), respectively (P<0.05). In the high-LM score patients, PR anaesthesia results in less blood loss and a better surgical condition for ESS than SR anaesthesia.12

In the present study, the intraoperative haemodynamic parameters consisting of heart rate and blood pressure were comparable between the two groups with no statistically significant difference. The actual cost of Sevoflurane 50 ml bottle was about 900 rupees while the cost of same volume of Propofol was around

600 rupees. It was unclear whether IVA with propofol actually reduced the amount of bleeding compared with the balanced anaesthesia with isoflurane. In the case of a comparison between sevoflurane and propofol anaesthesia, two reports showed less blood loss or a better surgical score in patients given propofol than those given sevoflurane.¹³⁻¹⁵

In another similar study conducted by Bharti, Neerja et al, authors compared the hemodynamic changes and emergence characteristics of sevoflurane versus propofol anesthesia for microlaryngeal surgery. The mean arterial pressure was significantly lower after induction and higher at insertion of operating laryngoscope in propofol group as compared to sevoflurane group. More patients in propofol group had episodes of hypotension and hypertension than sevoflurane group. The emergence time, extubation times, and recovery time were similar in both groups. They found that sevoflurane showed advantage over propofol in respect of intraoperative cardiovascular stability without increasing recovery time.¹⁶

CONCLUSION

From the above results, it can be concluded that Sevoflurane costs more than the Propofol. However, hemodynamic effect of both is comparable.

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