

ORIGINAL ARTICLE

Comparison Of Intraoperative Haemodynamic Parameters And Cost Effectiveness Between Sevoflurane (Inhalational) Anaesthesia And Propofol (TIVA) Based Anaesthesia

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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:** A total of 40 patients were enrolled. All the patients were randomly and broadly divided into two study groups as follows: Group 1: Sevoflurane group, and Group 2: Propofol group. All the patients were kept fasting overnight and were premedicated with Inj. Ranitidine 50 mg i.v in the pre operative 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. **Results:** The intraoperative haemodynamic parameters consisting of heart rate and blood pressure were comparable between the two groups with no statistically significant difference. The recovery profile showed a significant difference as regards spontaneous eye opening which was 10.5 minutes in group 1 and 14.6 minutes in group 2. The Sevoflurane still costs more than the Propofol. The actual cost of Sevoflurane 50 ml bottle was about 820 rupees while the cost of same volume of Propofol was around 550 rupees. **Conclusion:** From the above results, the authors concluded the Sevoflurane costs more than the Propofol. However; hemodynamic effect of both is comparable.

Key words: Propofol, Sevoflurane, Anesthesia

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INTRODUCTION

Sevoflurane has been in clinical use for inhalation anesthesia for more than 20 years and has been tested in numerous studies. The safety and efficacy of sevoflurane are well established and ongoing investigations have continued to more precisely define its effects in different patient populations and organ systems. Recent studies have reported on hemodynamic and recovery characteristics following anesthesia maintenance with sevoflurane. A wide range of studies have suggested a cardioprotective effect of sevoflurane in cardiac surgery, and it may also have protective effects in other organs.¹⁻³ Propofol is associated with faster recovery and better patient comfort, but it costs more than isoflurane. However, focussing on total costs, propofol might be more costeffective than isoflurane owing to the reduction in personnel costs because of faster recovery. Moreover, these positive aspects of propofol may not hold true when compared with sevoflurane.³⁻⁷ 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.

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. A total of 40 patients were enrolled. Complete demographic details of all the patients were obtained. A Performa was made and complete medical history of all the patients was recorded. All the patients belonged to the age range of 20 to 60 years with ASA Grade I and II. All the patients were randomly and broadly divided into two study groups as follows:

Group 1: Sevoflurane group, and

Group 2: Propofol group.

All the patients were kept fasting overnight and were premedicated with Inj. Ranitidine 50 mg i.v in the pre operative 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.

RESULTS

Mean age of the patients of Group 1 and group 2 was 48.5 years and 46.3 years respectively. Majority of the patients of both the study groups were of urban residence. Mean induction time among the patients of the Group 1 and group 2 was 47.3 seconds and 63.7 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 recovery profile showed a significant difference as regards spontaneous eye opening which was 10.5 minutes in group 1 and 14.6 minutes in group 2. The Sevoflurane still costs more than the Propofol. The actual cost of Sevoflurane 50 ml bottle was about 820 rupees while the cost of same volume of Propofol was around 550 rupees.

Table 1: Comparison of heart rate at different time intervals

Heart rate	Group A	Group B	p- value
Baseline	83.5	84.3	0.21
1 minute	79.6	78.6	0.45
5 minutes	78.4	79.8	0.26
10 minutes	79.3	79.4	0.28
20 minutes	78.1	79.3	0.31
30 minutes	77.3	78.2	0.84

Table 2: Comparison of systolic blood pressure at different time intervals

Systolic blood pressure	Group A	Group B	p- value
Baseline	135.4	134.2	0.25
1 minute	125.3	126.8	0.19
5 minutes	124.2	125.3	0.82
10 minutes	126.7	125.1	0.76
20 minutes	125.8	125.8	0.24
30 minutes	124.3	126.4	0.86

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

Diastolic blood pressure	Group A	Group B	p- value
Baseline	89.5	90.4	0.17
1 minute	87.5	88.1	0.96
5 minutes	85.6	86.2	0.62
10 minutes	85.3	84.3	0.53
20 minutes	84.6	85.9	0.58
30 minutes	85.7	84.2	0.68

DISCUSSION

Anaesthesiologists need to be aware of the costs of the anaesthetics, additional drugs and disposables commonly used in clinical practice to minimize excessive costs. Because of its cost-saving potential, office-based surgery is becoming increasingly popular, recruiting young and healthy patients as outpatients. However, the majority of in-patients in anaesthesiology are older, ranked up to ASA III. In this regard, it is important to select the most appropriate general anaesthetic technique that should be associated with a low incidence of perioperative sideeffects and rapid recovery, and with minimal total cost. This is fundamental when planning a safe and practical office-based general anaesthesia for older patients without compromising their clinical outcome and satisfaction. In several studies, the well-established volatile anaesthetic isoflurane was compared with the more ‘modern’ intravenous drug propofol and with the total intravenous anaesthesia

(TIVA).^{6- 10}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.

Mean age of the patients of Group 1 and group 2 was 48.5 years and 46.3 years respectively. Majority of the patients of both the study groups were of urban residence. Mean induction time among the patients of the Group 1 and group 2 was 47.3 seconds and 63.7 seconds respectively; the results of which were found to be statistically significant. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a study conducted by Mishra L et al, authors compared propofol with isoflurane anaesthesia with regard to haemodynamic stability, early emergence, postoperative nausea and vomiting (PONV) and early assessment of neurological functions. Eighty ASA

grade I & II adult patients were randomly allocated into two groups. Patients in study group received inj propofol for induction as well as for maintenance along with N₂O+O₂ and the control group patients received inj thiopentone for induction and N₂O+O₂+isoflurane for maintenance. BIS monitoring was used for titrating the anaesthetic dose adjustments in all patients. All patients received fentanyl boluses for intraoperative analgesia and atracurium as muscle relaxant. The haemodynamic stability was comparable in both the groups. The quality of surgical field were better in study group. Though there was no significant difference in the recovery profile (8.3% Vs 9.02%) between both the groups, the postoperative nausea and vomiting was less in propofol group than isoflurane group (25% Vs 60%). The anaesthesia cost was nearly double for propofol than isoflurane anaesthesia. Haemodynamic stability was comparable in both the groups.¹⁰

In the present study, also, the intraoperative haemodynamic parameters consisting of heart rate and blood pressure were comparable between the two groups with no statistically significant difference. The recovery profile showed a significant difference as regards spontaneous eye opening which was 10.5 minutes in group 1 and 14.6 minutes in group 2. The Sevoflurane still costs more than the Propofol. The actual cost of Sevoflurane 50 ml bottle was about 820 rupees while the cost of same volume of Propofol was around 550 rupees. Singh Y et al compared cost-effectiveness and recovery profile between propofol and sevoflurane for induction, maintenance or both. Ninety patients undergoing laparoscopic cholecystectomy were randomized into three equal groups to receive: Group P to receive injection propofol for both induction and maintenance; Group PS to receive injection propofol for induction and sevoflurane for maintenance; and Group S to receive sevoflurane for both induction and maintenance of general anaesthesia, respectively. Cost analysis, hemodynamic parameter, and recovery profile were compared between these groups. Total cost of anaesthesia was highest in Group P and lowest in Group S. Mean time to extubation and time to follow verbal commands was lowest in Group S than Group P or Group P/S. Hemodynamic parameter was more stable in Group S. They concluded that sevoflurane appears to be better anesthetic agents in terms of cost-effectiveness and recovery profile.¹¹ However; further studies are recommended.

CONCLUSION

From the above results, the authors concluded the Sevoflurane costs more than the Propofol. However; hemodynamic effect of both is comparable.

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