



SEVOFLURANE VERSUS PROPOFOL FOR INSERTION OF SUPRAGLOTTIC AIRWAY DEVICES – A COMPARATIVE STUDY.

Anesthesiology

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ABSTRACT

Background:- A popular method of providing anaesthesia for insertion of SGA device is with the use of bolus intravenous propofol, however it is associated with adverse effects like hypotension, apnoea, and pain on injection. Sevoflurane is a halogenated volatile anaesthetic which satisfies the conditions required for SGA devices insertion without the side effects as seen with propofol.

Objective:- To compare conditions for SGA insertion following anaesthesia with inhalation of sevoflurane or intravenous injection with propofol.

Methods:- 128 Patients posted for routine surgeries under general anaesthesia taken as study subject and randomly divided into 2 groups of 64 each. After premedication, Group P received intravenous propofol (2mg/kg body weight) with 100% oxygen via the face mask. In group S, Magill's circuit primed with Sevoflurane 8% in N₂O 50% and O₂ 50% (flow rate – 8lit/min) for 30 seconds connected to the face mask. After Loss of eyelash reflex, SGA insertion was attempted. The time taken from induction of anaesthesia to loss of eyelash reflex, time taken from loss of eyelash reflex to successful SGA insertion and hemodynamic parameters at baseline, at induction and every min for 5 minutes after induction were recorded in both the groups. Data was analysed using student's t-pair test and statistical significance set at P<0.05.

Results:- Successful LMA insertion in first attempt was 100% in group P with excellent conditions while in group S it was 89.067% (57 patients) with excellent to satisfactory conditions. Mean arterial pressure was observed statistically significant between the groups (p=0.03)

Conclusion:- Sevoflurane requires greater time for LMA insertion but with better haemodynamic stability. So, it can be used as an alternative.

KEYWORDS

laryngeal mask airway, propofol, sevoflurane

INTRODUCTION

A popular method of providing anaesthesia for insertion of supraglottic airway devices is with the use of intravenous (i.v.) propofol which has the advantage of inducing anaesthesia rapidly and depressing upper airway reflexes. However, bolus i.v. propofol has been associated with adverse effects like hypotension, apnoea, and pain on injection. Sevoflurane is a recently introduced halogenated volatile anaesthetic agent with a pleasant odour and low blood gas solubility which allows rapid induction and recovery.

On this background our study was undertaken with a primary aim to compare conditions for supraglottic airway devices insertion following anaesthesia with inhalation of sevoflurane or i.v. induction of propofol. Secondary aim was to compare the hemodynamic parameters such as BP, pulse rate, etc. and side effects if any.

METHODS

It was a Randomised clinical trial done after due permission of Institutional Ethics committee in Surgery Operation Theatre(OT), O&G OT, Urology OT of VIMSAR, BURLA, Sambalpur, Odisha. The study population included Patient undergoing short surgical procedures (45-60mins) in different OTs.

The inclusion criteria of patients were

- 1) Age -18 -50yrs
- 2) Patients of either sex
- 3) ASA Grade-1 & 2 with normal preoperative spirometry
- 4) Patient posted for elective short duration procedures

The exclusion criteria of patients were

- 1) Anticipated difficult airway
- 2) Risk of regurgitation, aspiration, full stomach

- 3) Chronic spine or medical disease
- 4) Upper respiratory tract infections in past 10 days
- 5) Morbidly obese patient

The sample size was calculated (Taking effect size 0.5 into consideration). Minimum sample size needed for group P was found to be 64 and that for group S was 64. Simple randomization was done. The demographic characteristics of sample were found. The study tools used were Supraglottic airway (SGA) - Laryngeal Mask Airway (LMA) size 3 and 4.

All the patients were kept fasting for at least 12 hours before induction of anaesthesia. Each patient was given premedication 15 minutes prior to induction of anaesthesia with injection glycopyrrolate (0.004mg/kg body wt), injection midazolam (.04mg/kg body wt) and injection nalbuphine (0.2mg/kg body wt). Monitoring consisted of ECG, BP, SpO₂, and ETCO₂. Intravenous line was secured and crystalloids were given. Patients were randomized into one of two groups (Group P: Propofol and Group S: Sevoflurane). Both groups received i.v. lignocaine (2ml of 1%) before induction.

Prior to the induction of anaesthesia, patients in both groups had a face mask placed over their face and breathing spontaneously. Group P received intravenous propofol (2mg/kg body weight) with 100% oxygen via the face mask. In group S, Magill circuit was primed with Sevoflurane 8% in N₂O 50% and O₂ (flow rate – 8 lit/min) for 30 seconds. Each patient was asked to exhale maximally and the primed circuit will be then connected to the face mask. They were asked to take vital capacity breaths.

Bispectral index (BIS) value (60) was considered as the point of

induction in both groups. SGA insertion was attempted by an experienced anaesthesiologist blinded to the insertion technique. The time of induction that is the time (in sec) taken from induction of anaesthesia as per BIS value at 60, and the time of SGA insertion i.e. time taken (in sec) from attending BIS value 60 to successful SGA insertion will record in both the groups. Grading of conditions IN LMA insertion^[1] was followed. Haemodynamic parameters were recorded at baseline, at induction and every min for 5 minutes after induction.

The data was collected on preformed data sheet. The data was managed by using Microsoft Excel. After matching baseline characteristics, all data was analyzed using SPSS Statistics Software. Mean and standard deviation values of all parameters were calculated. Student's paired test was used to compare the values. P value <0.05 was considered statistically significant.

RESULT

Table 1: Demographic Data Of The Patients

	Sevoflurane	Propofol	P value
AGE	42.55±8.089	45.19±5.430	0.669
WEIGHT	53.20±7.065	53.61±6.606	0.791

Quality of LMA insertion was noted with reference to grading of conditions of LMA insertion as shown in table 2.

Table 2: Grading Of Conditions Of LMA Insertion

Total Score	Excellent	Satisfactory	Poor
sevoflurane	89.0625%	10.9375%	0
propofol	100%	0	0

Mean induction time group-S and group-P was 116.22 ± 4.308 & 88.34 ± 7.941 seconds respectively which was statistically extremely significant (p<0.0001)

Table 3: Time Of Induction In Seconds

Groups in the study	Mean	N	Std. Deviation
sevoflurane	116.22	64	4.308
propofol	88.34	64	7.941
Total	102.28	128	15.371

Mean Pulse Rate and Mean arterial pressure were noted at regular interval as shown in charts 1, 2 respectively. ECG findings and Spo2 remains stable throughout the surgery in both the groups.

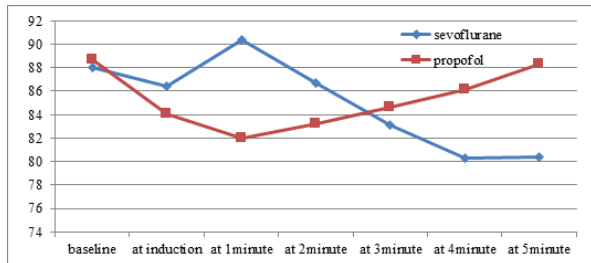


Chart1: Comparison Of Mean Pulse Rate

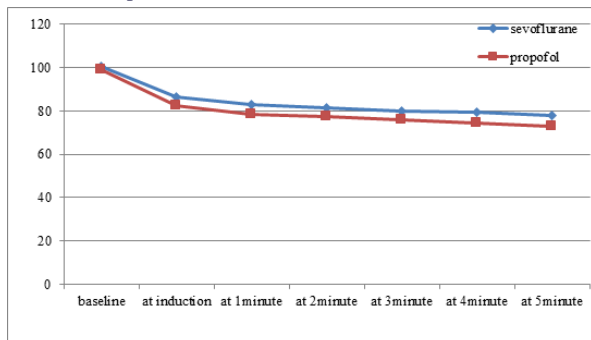


Chart 2: Comparison Of Mean MAP (mm Hg)

DISCUSSION

The induction time was longer with sevoflurane than with propofol which was statistically significant, similar to a study by Hall et al and A Thwaites et al.^[2,3] Mean time taken from start of induction to successful laryngeal mask insertion was significantly shorter (p<0.001) with

propofol (88.34 ± 7.941 seconds) compared with sevoflurane (116.22 ± 4.308 seconds) which may due to relaxant action of propofol on jaw muscles while prolonged jaw tightness was associated with sevoflurane which is seen in present study also.^[4]

Occurrence of complications like coughing, gagging and laryngospasm during LMA insertion were not noticed in both the groups of this study which may be due to adequate depth of anaesthesia with depression of laryngeal reflexes by both agents.

The overall insertion was excellent with propofol with all 64 patients (100%) scoring 18. With sevoflurane, 57 patients (89.067%) had excellent conditions for LMA insertion and 7 patients (10.933%) had satisfactory conditions. The difference of excellent conditions between the two groups was almost equal to significant level (p=0.007) Lian et al in their study found that more attempts at insertion of LMA were required in patients in sevoflurane group than in propofol group because of inadequate mouth opening.^[4] These findings are comparable to our study also. Priya et al found no difference in number of attempts required to insert LMA.^[5]

LIMITATION

Sevoflurane expenditure/cost effectiveness is not calculated in the study as it is available free of cost under “Niramaya” programme of Govt. of Odisha. Patient recovery profile is not assessed in the study. OT pollution level is not assessed for the drugs used.

CONCLUSION

Conditions for LMA insertion provided with intravenous propofol are better than sevoflurane but haemodynamic stability is better with sevoflurane than propofol. So, sevoflurane can be used as an alternative.

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Conflicts Of Interest: - Nil

Funding: - No funding sources

Ethical Approval: - The study was approved by the Institutional Ethics Committee.

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