International Journal of Medical Anesthesiology

E-ISSN: 2664-3774
P-ISSN: 2664-3766
www.anesthesiologypaper.com
IJMA 2018; 1(1): 46-49
Received: 12-01-2018
Accepted: 09-03-2018

Dr. Vinoth N
Assistant Professor, Department of Anesthesiology, RVS, Institute of Medical Sciences, Chittoor, Andhra Pradesh, India

Dr. Thumu Sree Hari Reddy
Assistant Professor, Department of Emergency Medicine, Narayana Medical College, Nellore, Andhra Pradesh, India

Corresponding Author:
Dr. Thumu Sree Hari Reddy
Assistant Professor, Department of Emergency Medicine, Narayana Medical College, Nellore, Andhra Pradesh, India

Investigation of adult tonsillectomy induction and recovery using propofol and sevoflurane in a day-care setting

Dr. Vinoth N and Dr. Thumu Sree Hari Reddy

DOI: https://doi.org/10.33545/26643766.2018.v1.i1a.454

Abstract
Background: If a patient is having elective surgery on a specifically chosen day and all of the required procedures can be completed in one sitting, they may be able to get an ambulatory anaesthetic. It is hardly an overstatement to claim that mobile anesthesia is a rapidly developing subspecialty of general anaesthesia.
Methods: The research was conducted using a prospective randomized trial method. From February 2017 through December 2017, researchers from the Department of Emergency Medicine, Narayana Medical College, Nellore, Andhra Pradesh, India, worked in the ENT operating room after obtaining approval from the hospital administration and an ethics committee.
Results: In order to carry out the study, researchers employed a random allocation method to divide 30 patients into two groups of 15. In the initial cohort, propofol anesthesia was administered. Group 2 received Sevoflurane Anesthesia. The process of inducing Sevoflurane in adult tonsillectomies is more challenging and requires a longer recovery period compared to Propofol. Both groups exhibit a comparable incidence of apnea.
Conclusion: In the context of inducing and sustaining anesthesia during outpatient procedures on adults, propofol demonstrates superiority over alternative sedatives and anaesthetics. The procedure exhibits a reduced duration of induction and decreased incidences of postoperative nausea, vomiting, and pain.

Keywords: Sevoflurane, propofol, induction, adult tonsillectomies in childcare, postoperative

Introduction
Elective surgery can be performed on a limited number of patients during a single day with the utilization of accessible anesthesia, enabling the completion of all procedural components in a single session. The administration of anesthesia in a day case context is commonly known as outpatient anesthesia, anesthesia provided in day care facilities, and, more recently, office-based anesthesia [1-3].
Mobile anaesthesia is undeniably one of the most thrilling advancements in the field of anesthesia. Despite its existence for a considerable period of time, the concept of general anesthesia has only recently gained significant traction and continues to undergo further advancements [3, 4].
It accounts for around 70 percent of all anaesthetic procedures conducted globally. According to the newly published policy by the National Health Service (NHS), it is anticipated that a significant proportion of elective surgical procedures will be conducted as day cases in the foreseeable future [5, 6]. The aesthetic drugs currently available were developed and introduced to the market to meet a specific yet highly important need in the realm of mobile anesthesia. The administration of propofol and sevoflurane has facilitated anesthesiologists in India to enhance the quality of day case therapy for their patients. This study evaluates the efficacy of two anesthetics in outpatient settings, primarily focusing on the duration of induction and recovery [7, 8].
The objective of this study is to conduct a comparative analysis of the impacts of propofol and sevoflurane as the exclusive anesthetic agents for induction and maintenance in adult tonsillectomies. The comparison will explicitly examine the duration of patients' loss of consciousness, the occurrence of apnea, the potential complications during induction, the recovery period, and the frequency of postoperative nausea, vomiting, and pain.

Materials and Methods

The research was conducted using a prospective randomized trial method. From February 2017 through December 2017, researchers from the Department of Emergency Medicine, Narayana Medical College, Nellore, Andhra Pradesh, India, worked in the ENT operating room after obtaining approval from the hospital administration and an ethics committee.

Inclusion Criteria

- People between the ages of 13 and 40
- Individuals who frequently move well
- A knowledgeable participant with good direction-giving skills.

Exclusion Criteria

- The patient refuses to receive ASA class III or higher
- Individuals with allergies to eggs or H/O medications may experience difficult breathing

Results

The trial participants were allocated into two cohorts, with each cohort consisting of 15 patients. Group 1 received propofol anesthesia. Group 2 received sevoflurane anesthesia.

Table 1: Age breakdown of cases according to groupings

Age	Group 1	Group 2
No. of cases	15	15
Mean	21.0	19.0
S.D.	9.02	9.31
Median	16.1	16
Range	15 – 41	12 – 41

Despite the observation that Group 1 exhibited a higher average age compared to Group 2, this disparity did not reach statistical significance.

Table 2: Distribution of cases by sex and by groupings

Sex	Group 1 (n=15)		Group 2 (n=15)	
	No.	%	No.	%
Male	7	46.33	6	40
Female	8	53.33	9	60

Group 1 had a higher proportion of females compared to males, but Group 2 members were evenly divided. There is no statistically significant difference observed in the distributions of the two groups.

Table 3: The allocation of case weights across different groupings

Weight	Group 1	Group 2
No. of cases	15	15
Mean	40.0	42.0
S.D.	12.12	8.32
Median	30	30
Range	14 – 30	14 – 30

There was no statistically significant difference found in the distribution of cases by weight and the mean values between Group 1 and Group 2.

Table 4: The distribution of case weights among different groups

ASA	Group 1 (n=15)		Group 2 (n=15)	
	No.	%	No.	%
Grade I	15	100.0	15	100.0
Others	0	0.0	0	0.0

On the ASA scale, every case from every group was assigned an identical rating, rating I. Consequently, the ASA scores of both groups are the same.

Table 5: Distribution of cases based on MPC and group

MPC	Group 1 (n=15)		Group 2 (n=15)	
	No.	%	No.	%
Grade I	10	66.66	12	80.00
Grade II	5	33.33	3	20.00

The statistical significance of the distribution of cases by MPC and the two groups was not seen, but Group 1 exhibited a larger proportion of Grade I cases compared to Group 2.

Discussion

It is common practice to put patients under anaesthesia with intravenous medication and maintain their sedation using inhaled narcotics. When applying the method to continued care after induction, inconsistencies emerge. It is critical to inject the inhalational anaesthetic deeply enough to avoid rapid redistribution of the intravenous medication, which would cause the anaesthetic to wear off too rapidly. Because of this, "single agent" anesthesia has been established; this technique does away with premedication altogether. Due to its short half-life and relatively low occurrence of adverse effects, propofol finds extensive application in complete intravenous anesthesia.

There has been an uptick in the use of propofol infusions to maintain anesthesia. Unfortunately, propofol slows the heart and lungs, is uncomfortable to inject, and can only be administered intravenously [9, 10]. One of the best inhalational anaesthetics is sevoflurane, which is both safe and flexible. Sevoflurane is a versatile anaesthetic that can be used in both in-patient and out-patient settings to induce and maintain anaesthesia in both adults and children. Sevoflurane has the best physical, pharmacodynamic, and pharmacokinetic characteristics of any anaesthetics. Anaesthetics should ideally have the following characteristics: minimal side effects, quick onset and recovery from anaesthesia, low solubility in blood and gases, minimal impact on brain blood flow, and a boiling point and vapour pressure that permit delivery by conventional vapourization methods [11-13].

The availability of this medicine provides a welcome option when used in conjunction with other, more reliable methods of induction and maintenance anesthesia (VIMA). Asking adults about their anaesthetic induction choices before surgery revealed that 33% would choose intravenous (IV) induction, 50% would choose inhaled (nitrous oxide), and 17% were unsure. So long as there is no danger of regurgitation or breathing difficulties, they recommend asking healthy patients having elective outpatient surgeries about their preferred method of anaesthetic induction whenever feasible and suitable. The findings stated earlier [14, 15] served as the foundation for our inhalation induction technique. Although sevoflurane inhalational induction was much slower than propofol intravenous induction, A. Thwaites, S. Edmends, and I. Smith found that it was associated with a reduced incidence of apnoea and a shorter time to establish spontaneous breathing. Sevoflurane inhalation induction is much quicker than propofol induction, and there was no difference in the occurrence of coughing, airway discomfort, or laryngospasm, according to

researchers Brain Fredman, MH. Nathanson, I. Smith, J. Wang, K. Klein, and PF. White [16, 17].

Induction using sevoflurane is more time-consuming and risky, according to our research. In agreement with the findings of a study comparing these two medications by W. Scott Jellish, MD, PhD, Cynthia A. Lien, MD, H. Jerrel Fontenot, PhD, and Richard Hall, MD, FRCPC, FCCPS, we demonstrate that sevoflurane and propofol accomplish the same goals when it comes to inducing and sustaining anesthesia in adults. Compared to other anaesthetics, propofol has a shorter induction time. To rub salt in the wound, compared to propofol, sevoflurane had a greater risk of airway excitation complications during mask induction. This explains why more participants in the sevoflurane group suffered bronchospasm [18, 19].

The patient hardly moved an inch while the intubator worked, mostly shifting their hands and feet. No compromise was found in hemodynamic stability or tracheal intubation. When comparing the induction and recovery phases of sevoflurane and propofol, researchers J.K. Moore, E.W. Moore, R.A. Elliott, A.S. St. Leger, K. Payne, and J. Kerr found that patients were more prone to move around during the sevoflurane induction phase. Apnea can be caused by propofol and sevoflurane, although at different amounts. Pretreatment with opioids enhances the efficacy of these respiratory depressants. Because of this, we can understand why the two groups had comparable apnea prevalence rates. During the induction of anesthesia, both groups saw a decrease in mean arterial pressure (MAP), although the propofol group showed a more pronounced reduction. The heart rates of both groups rose by around 5 beats following the induction of anesthesia. The use of glycopyrrolate immediately preceding induction is likely to blame for this. Possibly the reason why one patient experienced bradycardia during sevoflurane induction of anesthesia is because the gas directly inhibits the beta-adrenoceptor system. Phase I recovery, or emergence from anaesthesia, is accelerated more by sevoflurane than by propofol, according to statistical analysis. This is in line with what A. Thwaites, S. Edmends, and I. Smith found when they compared sevoflurane and propofol as anaesthetic inducers [18–21].

Our study found that the induction and maintenance times for phase II recovery were similar for propofol and sevoflurane anaesthetics. Although sevoflurane anesthesia reduced postoperative pain, it increased postoperative nausea and vomiting. We have all contributed to this body of works. Propofol may have reduced postoperative nausea and vomiting in the propofol group due to its 'intrinsic' antiemetic effect [19]. Compared to the isoflurane group, patients given sevoflurane may have needed analgesics for a shorter amount of time following surgery due to its fast recovery profile, lack of tissue solubility and accumulation. The analgesic effects of propofol have been postulated but not demonstrated [20-23].

Conclusion

In adults undergoing tonsillectomy, sevoflurane induction is more challenging and recovery time is lengthier than with propofol. An equal number of cases of apnea occur in both groups. Recovery time in Phases I and II was comparable for the two groups. The incidence of postoperative pain was found to be statistically unrelated to sevoflurane anesthesia. When it comes to inducing and maintaining anesthesia during outpatient procedures on adults, propofol is the way to go. It reduces the incidence of postoperative pain, vomiting, and nausea while also shortening the induction period.

Conflict of Interest

None

Funding Support

Nil

References

1. Di M, Han Y, Yang Z, Liu H, Ye X, Lai H, *et al*. Tracheal extubation in deeply anesthetized pediatric patients after tonsillectomy: a comparison of high-concentration sevoflurane alone and low-concentration sevoflurane in combination with dexmedetomidine pre-medication. BMC Anesthesiology. 2017 Dec;17:1-7.
2. Jellish WS, Lien CA, Fontenot HJ, Hall R. The comparative effects of sevoflurane versus propofol in the induction and maintenance of anaesthesia in adult patients. Anesth Analg. 1996;82(3):479-485.
3. Miller RD. Inhaled Anaesthetics. In: Miller's Anesthesia. 6th ed. Philadelphia, PA: Elsevier Churchill Livingstone; c2005. p. 105-316.
4. Viitanen H, Tarkkila P, Mennander S, Viltanen M, Annila P. Sevoflurane-maintained anaesthesia induced with propofol or sevoflurane in small children: induction and recovery characteristics. Can J Anaesth. 1999;46(1):21-28.
5. Fredman B, Nathanson MH, Smith I, Wang J, Klein K, White PF. Sevoflurane for outpatient anesthesia: A comparison with propofol. Anesth Analg. 1995;81(4):823-828.
6. Moore JK, Moore EW, Elliott RA, St. Leger AS, Payne K, Kerr J. Propofol and halothane versus sevoflurane in paediatric day-case surgery: induction and recovery characteristics. Br J Anaesth. 2003;90(4):461-466.
7. Watson KR, Shaw MV. Clinical comparison of ‘single agent’ anaesthesia with sevoflurane versus target-controlled infusion of propofol. Br J Anaesth. 2000;85(4):541-546.
8. Stoelting RK. Pharmacokinetics and pharmacodynamics of injected and inhaled drugs. In: Basics of Anesthesia. 4th ed. Philadelphia, PA: Elsevier Saunders; c2006. p. 3-163.
9. American Society of Anesthesiologists Committee on Ambulatory Surgical Care. Communication; c2003.
10. Delgado-Herrera L, Ostroff RD, Rogers SA. Sevoflurane: Approaching the ideal inhalational anaesthetic - A pharmacologic, pharmacoeconomic and clinical review. CNS Drugs Rev. 2001;7(1):48-120.
11. Joo HS, Perks WJ. Sevoflurane versus propofol for anesthetic induction: A Meta-Analysis. Anesth Analg. 2000;91(1):213-219.
12. Thwaites A, Edmends S, Smith I. Inhalation induction with sevoflurane: a# double blind comparison with propofol. Br J Anaesth. 1997;78(4):356-361.
13. Yurino M, Kimura H. Induction of anaesthesia with sevoflurane, nitrous oxide and oxygen - A comparison of spontaneous ventilation and vital capacity rapid inhalation induction techniques. Anesth Analg. 1993;76(3):598-601.
14. van den Berg AA, Chitty DA, Jones RD, Sohel MS,

Shahen A. Intravenous or inhaled induction of anaesthesia in adults? An audit of preoperative patient preferences. Anesth Analg. 2005;100(5):1422-1424.
15. Yogendran S, Prabhu A, Hendy A, McGuire G, Imarengiaye C, Wong J, *et al*. Vital capacity and patient-controlled sevoflurane inhalation induction result in similar induction characteristics. Can J Anaesth. 2005;52(1):45-49.
16. Greenspun JCF, Hannallah RS, Welborn LG, Norden JM. Comparison of sevoflurane and halothane anesthesia in children undergoing outpatient Ear, Nose and Throat Surgery. J Clin Anesth. 1995;7(5):398-402.
17. Siddik-Sayyid SM, Aouad MT, Taha SK, Daaboul DG, Deeb PG, Massouh FM, *et al*. A comparison of sevoflurane-propofol versus sevoflurane or propofol for Laryngeal mask airway insertion in adults. Anesth Analg. 2005;100(4):1204-1209.
18. Reader J, Gupta A, Pedersen FM. Recovery characteristics of sevoflurane- or propofol-based anesthesia for day-care surgery. Acta Anaesthesiol Scand. 1997;41(8):980-984.
19. Lien CA, Hemmings Jr HC, Belmont MR, Abalos A, Hollmann C, Kelly RE. The efficacy of sevoflurane-nitrous oxide or propofol-nitrous oxide for the induction and maintenance of general anaesthesia: A comparison. J Clin Anesth. 1996;8(8):639-643.
20. Assmann N, Terblanche M, Griffith R. Postoperative analgesia and discharge criteria for day-case surgery. Anaesth Intensive Care Med. 2004;5(3):104-105.
21. Gürkan Y, Kılıçkan L, Toker K. Propofol-nitrous oxide versus sevoflurane-nitrous oxide for strabismus surgery in children. Paediatr Anaesth. 1999;9(6):495-499.
22. Picard V, Dumont L, Pellegrini M. Quality of recovery in children: Sevoflurane versus propofol. Acta Anaesthesiol Scand. 2000;44(3):307-310.
23. Gupta A, Stierer T, Zuckerman R, Sakima N, Parker SD, Fleisher LA. Comparison of recovery profile after ambulatory anaesthesia with propofol, isoflurane, sevoflurane and desflurane: A systematic review. Anesth Analg. 2004;98(3):632-641.