

ORIGINAL ARTICLE

Outcomes of Propofol or Thiopental Sodium and Oral Midazolam as an Induction Agent for Day Care Surgery

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ABSTRACT

Background: Acceptance of day surgery has been steadily rising for over a decade. Day surgery is essential in developing countries since it allows for quick healing and lower overall costs. Day surgeries have been on the rise in recent years. Induction agents like propofol and thiopentone are frequently utilized during outpatient procedures. This study aimed to compare ASA grade I and II patients undergoing day surgery, the compass reading time, hemodynamic comeback, respiratory upshots, and the postoperative resurgence of the two medications.

Objective: Oral midazolam, thiopental sodium, and propofol were all used for induction before day surgery. The goal was to determine which method was most cost-effective and resulted in the quickest recovery.

Methodology: The study was conducted at Khyber Teaching Hospital, Peshawar, Pakistan from February, 2023 to July, 2023. A total of sixty patients were selected, practically thirty from one of ASA's top two health tiers. In group A, patients were given 2.0 mg/kg of propofol for compass reading, while in group B, patients were given 0.250 mg/kg of oral midazolam 30 minutes prior they were prearranged 2.50 mg/kg of thiopental sodium for induction. During the operation, doctors kept tabs on the patient's vital signs, BP, recuperation score, and ability to return home. For both groups, we calculated the typical price of induction.

Result: After 30 minutes of reverse, group A scored 8.8 ± 1.75 , and group B scored 8.01 ± 1.03 . Group B's costs (BDT 37.88 ± 1.37) were considerably lower than A's (BDT 142.00 ± 6.00), with a P value of < 0.05 .

Conclusion: For outpatient surgeries, using vocal midazolam and low- a prescribed amount of thiopental sodium orientation is more cost- effectual than propofol induction.

Keywords: Day care surgery, Oral midazolam, thiopental sodium, propofol.

INTRODUCTION

With the popularity of minimally invasive surgical techniques in recent years, there has been a corresponding emphasis on the growth of outpatient or "day" surgery. Those who are admitted for an evaluation or operation on a scheduled nonresident basis but still require facilities for recovery and can make a full recovery and go home within a day are considered surgical day case patients by the Royal College of Surgeons (24 hrs.)^[1]. The ideal anesthetic agent for ambulatory surgery should have a smooth and rapid induction, fast recovery, intraoperative amnesia, analgesia, and minimal side effects postoperatively. Thiopentone is traditionally associated with prompt induction, squat duration of action, and nominal side upshots. However, poor psychomotor recovery and subjective feeling of tiredness and drowsiness during the postoperative period limits its usefulness in daycare patients. The disadvantages, however, are the cardio stimulatory effect, the emergence of delirium, and _ hallucinations postoperatively. It also has been associated with increased pulmonary resistance^[2].

Daycare surgical cases are admitted for an operation or examination as scheduled, without the resident's stay, occupying beds for a specified period in a separate operating room unit, and returning home on a similar day, also known as "daycare surgery"^[3]. This is the utmost theatrical change in the delivery of health services in the current era^[4].

Surrounded by the early days of anesthesia, nitrous-based oxide and the upper air were applied for noninvasive procedures such as tooth withdrawals that did not necessitate an overnight stay in the hospital. As early as 1916, RD Waters was a trailblazer in the field of anesthesia, with the opening of the first outpatient anesthetic clinic in Sioux City, Iowa. The economic restraints of virtually the 1970s and also 1980s led to a dramatic amplify in elsewhere patient surgeries. Still, the sub-area of expertise of ambulatory anesthesia designed for daycare procedures did not emerge until much later. With the advent of newer, more efficient drugs, a shorter time to take action, and the refinement of surgical techniques, patients can now recover from their procedures more quickly. They may even be able to leave the

day surgery unit sooner^[5,6]. Nearly a century ago, Lundy invented thiopental for use in anesthesia (Lundy 1935). Since then, comparisons have been made between thiopental and propofol, two intravenous anesthetics presented as alternatives to thiopental. When used for outpatient anesthesia, thiopentone has been associated with rapid induction of anesthesia without major side effects, according to research by White (1984)^[4]. Intravenous propofol (2,6-diisopropyl-based phenol) is a persuasive hypnotic drug build-up by John Glen and Roger James in 1977^[7]. This marked the beginning of the widespread adoption of the use of an induction medication administered intravenously for all outpatient procedures. The study confirmed propofol's potential as an intravenous type anesthesia initiation agent^[8]. This study aimed to evaluate the hemodynamic retorts to induction and recovery from anesthesia using Thiopentone and Propofol as a comparison^[9].

MATERIAL AND METHOD

The KTH's ethics principles committee endorsed the cram. Everyone who took part in the study agreed to participate. Patients were reciprocally male and female, aged 20 to 55, and from ASA risk groups I and II. All of the procedures listed can be completed in twenty minutes or less. Sixty patients were evaluated throughout the trial.

Inclusion criteria: Whether a man or a woman, those between the ages of 20 and 55 Anesthesia Severity Categories (ASA) I and II, Surgery posted for day care elective procedures Assuming Prior Medication: Anesthesia can be induced by injecting 0.2 milligrams of glycopyrrolate intravenously ten minutes beforehand, followed by 1 milligram per kilogram of body weight of fentanyl.

Exclusion criteria: Up until that point, I had an allergy to all drugs. Intolerant to eggs and soy oil, there are three main categories of obstacles to treating patients who refuse treatment, patients with neuropsychiatric disorders, and those with trouble communicating. A computer-generated randomization chart was used to assign patients to one of two groups randomly. The surgeon and the postoperative nurse were kept in the dark about which medicine was administered. Thiopentone Sodium 2.5% (n=30) was used in Group A. Propofol 1% (n=30) made up Group B. The patients were put at ease by explaining the procedure's formalities in their tongues. Electrocardiography, arterial oxygen saturation, and

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noninvasive blood pressure were tracked during patient care. Access was gained intravenously with an 18-gauge cannula fitted with a three-way connector. At the beginning of the trial, the participants' systolic, diastolic, and insinuate blood pressures, heart paces, respiratory paces, and oxygen saturations were all measured. Inject glycopyrrolate 0.20 mg i.v. approximately 10 minutes previous to the initiation, and Inj. Fentanyl 1g/kg immediately the following orientation, while patients breathed through a mask to evaluate injection pain. Patients were premedicated and oxygenated before receiving a 30-second intravenous injection of either a placebo or their assigned drug. The induction time is measured from the first injection to the moment when the eyelash reflex no longer responds. In addition to documenting the presence or absence of apnea during the induction process, patients were also asked about any discomfort they experienced during the injection. Patients with apnea were given bag-and-mask ventilation until they resumed breathing independently. After induction, vital signs were recorded, including BP, HR, SpO₂, and RR. Maintenance Maintaining unconsciousness required a combination of 66 percent Nitrous Oxide, 33 percent Oxygen, and 1 percent Isoflurane. Those affected were free to breathe on their own. Heart rate, SpO₂, systolic, diastolic, insinuate blood pressures, and respiratory pace were monitored for the earliest five minutes, then apiece five minutes after that. The starting time of instrumentation and its total duration were recorded. Recovery Timing is recorded when equipment fails. After the procedure, the patient was switched to receiving 100% oxygen. Modified Aldrete's Score was used to keep track of recuperating personalities^[10]. We also noted any postoperative symptoms like sickness and throwing up or chills. Inj. Ondansetron 4 mg was administered to combat postoperative sickness and vomiting. Those who had to shiver were given oxygen alone, and if that didn't help, they were given oxygen plus intravenous tramadol (25 mg). Patients are transferred to the post-operational ward intended for additional monitoring after fully recovering.

SOCA Score:

Sedation:	
Tensed or wide-eyed with alertness	4
Awake, but not on edge or tense	3
Tired or dozing out but awake unable	1
Asleep and not rousable	0
Drowsy ^[11]	2
Orientation:	
Exponential Orientation	
Partially disoriented	12
Complete and utter confusion	0
Comprehension:	
Carrying out a directive	2
An order can be carried out only if it is initiated.	1
No execution of an order	0
Amnesia:	
A lack of memory loss	3
Mild forgetfulness	2
Moderate amnesia	1

In most cases, a discharge will be granted only if a score of 10 or higher is achieved.

RESULTS

The demographic information of the two groups was compared to one another to identify any statistically significant differences. The homogeneous distribution of cases across categories was designated by all p-values being finer than <0.05. (Table 1). In addition, nearby were no notable variations in the allocation of ASA grades flanked by the two groups.

Hydrocele accounted for 20% of the cases requiring day surgery, followed by DUB (18.330%) and fibroadenoma nearly (16.670%). (Table 2). Table 3 shows that the most common procedures in a daycare setting are hydrocectomies, followed by dilatation and curettage (D&C). One person in group A (3%) reported experiencing pain, while n=5 (16.67%) people in group B reported the same. Results from calculating p-values were

inconclusive. Both groups' systolic blood pressures were taken at the 0-minute and 20-minute marks. In both the one- and two-minute intervals, group B experienced a greater reduction in systolic blood pressure than group A. (p <0.05). Nevertheless, there was no statistically significant distinction in the rate of SBP drop between the two groups in any of the subsequent periods. Taking their diastolic blood pressure, the two groups did not fluctuate significantly from one another.

Table 1: Demographic Parameters

Demographic parameters	Groups	N	Mean	Standard deviation	P-Value
Age	A (Thiopentone)	30	35.53	10.477	0.708
	B (Propofol)	30	39.93	10.267	
Weight	A (Thiopentone)	30	57.63	6.713	0.55
	B (Propofol)	30	58.23	9.126	
Duration of procedure	A (Thiopentone)	30	15.53	2.596	0.377
	B (Propofol)	30	15.37	2.141	
Duration of induction	A (Thiopentone)	30	36.77	4.023	0.414
	B (Propofol)	30	35.27	3.685	

Table 2: Information about the patient, including their age, weight, height, and ASA classification.

Characteristics	Group A (n=30)	Group B (n=30)	P value
Age (years)	27	25.95%	0.546
Height (cm)	156.25%	61.50%	0.063
Weight(kg)	63.80%	152.65%	0.071
ASA-I	87%	93.4%	0.182
ASA-II	13.4%	7%	0.513

Data are presented, seeing the mean and standard deviation. We used a students' t-test to see if there was a difference between age, body mass index, height, and ASA grades between the two groups and found no significant difference (NS: p > 0.05).

Table 3: distribution of gases

Diagnosis	Group A	Group B	Total	Percentage
Bartholin cyst	0	1	1	1.67
Phimosis	3	4	7	11.67
Sebaceous cyst	2	2	4	6.66
Varicocele	1	1	2	3.33
Fibroadenoma	5	5	10	16.67
Ganglion	1	1	2	3.33
Hydrocele	6	6	12	20.0
DUB	5	6	11	18.33
Sterilization	3	3	3	10.0
Lipoma	4	1	5	8.33

Table 4: distribution of procedure

Procedure	Group A	Group B	Total
Vasectomy	7 (24%)	4 (13.33%)	11
Tubectomy	5 (17%)	5 (17%)	10
Marsupialization	5 (17%)	6 (20%)	11
Varicocelectomy	6 (20%)	6 (20%)	12
Circumcision	3(10%)	4 (13.33%)	7
Hydrocelectomy	1 (3%)	1 (3%)	2
D&C	-	1 (3%)	1
Lumpectomy	2 (6%)	1 (3%)	3
Excision	1 (3%)	2 (6%)	3
Total	30	30	60

Table 5: Total recovery score

	Sum of the Mean Standard Deviation, Group A		Statistics: Mean Standard Deviation, Group B		P-Value
15 minutes	9.77	0.43	10.00	0.00	0.005
10 minutes	9.50	0.62	10	0.00	0.000
5minutes	9.10	0.89	9.83	0.53	0.008
0 minutes	10	0.00	10.00	0.00	0.000

The propofol group appeared to have somewhat more apnea episodes, other than the discrepancy was not statistically noteworthy. More people in the thiopentone group experienced shivering than those in the propofol-based cluster, although the difference was not statistically significant^[12]. The thiopentone group had a significantly higher commonness of nausea. As an added note, the thiopentone group experienced more cases of vomiting than the propofol group.

DISCUSSION

Day surgery has grown significantly in popularity around the world for many reasons. Recovery time is reduced, and patients can

begin walking again sooner, which is a significant benefit. The principal purpose of this study was to compare the convenience of 1 percent Propofol to that of 2.5 percent Thiopentone. Causes, diagnoses, procedures, and times spent on each were distributed similarly across the cases chosen randomly for the study. According to Gerald Edelist's guidelines, the 'equipotent amount' of medications needed to cause loss of eyelid reflex was 2.0 mg/kg in the propofol cluster and 4.0 mg/kg in the thiopentone cluster. According to these results, propofol is roughly twice as effective as thiopentone. As a major side effect, pain at injection was most common in the Propofol group (16.6%), followed by the thiopentone group (3.3 percent)^[13]. Fahy et al. compared the induction properties of propofol and thiopentone and was found to be out of harm's way and effective initiation negotiators in vigorous patients. However, it was associated with a higher rate of injection pain and a more dramatic drop in blood pressure than thiopentone. According to randomized, double-blind research by Lee et al.,^[14] thiopentone is more effective than lignocaine at alleviating pain after propofol injection. Large vein chilling the fluid before injection was one strategy to lessen the pain associated with injecting propofol^[15]. Aspirating blood, pre-treating with aspirin and opiates, combining with lignocaine, and administering saline are all mentioned^[16,17]. When comparing propofol and thiopentone for use in outpatient anesthesia, Johnston et al. found that the propofol group was more likely to experience apnea, pain during injection, and spontaneous movement. Both groups had similar resting hemodynamic values. Systolic blood pressure was significantly lower within cluster B (propofol) than in cluster A (thiopentone) at the one-, two-, and three-minute marks after induction. There was a large disparity between the two groups' second-minute readings and their first ones. Systolic blood pressures in the propofol cluster were statistically momentous at 1 and 2 minutes after induction but were clinically acceptable. When comparing propofol and thiopentone groups, diastolic pressures were significantly lower in the former. Similarly, the propofol group's mean pressures were lower than the controls. There was a statistically significant drop in mean arterial pressure at the two-minute mark following induction. These conclusions conform with those of Grounds RM et al., who came to similar conclusions after 2 minutes with thiopentone. Systemic blood pressure drops more with propofol than with thiopentone at the same doses, as is well-documented. Smooth muscle in the blood vessels is loosened by propofol. It occurs mostly because of suppression of compassionate vasoconstrictor activity. When propofol has an unhelpful ionotropic impact, it is mostly because it blocks calcium entry across the sarcolemma^[18]. There was no statistically or clinically meaningful difference between the two groups regarding how their oxygen saturation levels changed over time as measured by the SpO₂. More patients in the propofol group experienced apnea of a shorter duration than those in the other group. All of the patients recovered spontaneous breathing using a bag and mask ventilation. None of the medicines used had any clinically significant depressant effects on the respiratory system. All patients were observed for twenty minutes in the recovery room to determine their unique healing patterns. Many different metrics can be used to assess the success of anesthetic recovery. To quantify the improvement, we employed a variant of Aldrete's grading system^[19]. After 15 minutes, all study participants were well enough to be discharged from the postoperative care Centre. Consciousness recovery scores followed the same pattern as the activity scores. However, the thiopentone group showed considerable awareness level improvement after 10 minutes. Overall, the thiopentone group had a poor rate of recovery. Comparing propofol to thiopentone, propofol is the clear winner^[20].

CONCLUSION

In the current study, induction with propofol (2 mg/kg body weight delivered intravenously) was equivalent to induction with thiopentone. Propofol caused greater cardiovascular-based melancholy and apnea than thiopentone, endured in healthy individuals but significantly borders its application in the aged and sick. Compared to thiopentone, propofol facilitates a speedier recovery from anesthesia, with fewer postoperative problems and superior quality of upturn. Propofol is more expensive than thiopentone, which could slow its uptake in hospitals. On the other hand, propofol has been associated with speedier healing and earlier discharge, which may reduce the patient's out-of-pocket expenses.

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