

## INTRAVENOUS PROPOFOL FOR MINOR ORAL AND MAXILLO FACIAL SURGERY

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**ABSTRACT****Back ground and objectives:** this study evaluated the efficacy and feasibility of intravenous propofol along with local anaesthesia for minor oral and maxillofacial surgical procedures.**Methods:** 25 ASA class 1 or 2 patients undergoing elective minor oral surgery procedures were selected for inclusion in this study. After pre medication with atropine 0.6 mg/kg intramuscularly. Anaesthesia was induced with 2 mg/kg propofol, 1mg midazolam and 50 micro grams of fentanyl and was maintained with a continuous infusion of propofol. 2 % lidocaine with 1:2,00,000 adrenaline was injected and the operative procedure was carried out. The quality of anaesthesia was subjectively evaluated by recording the intra operative vital parameters, the anaesthetist, the surgeon, and the patient (using the Awareness and Recall Questionnaire).**Results:** Results showed that all vital parameters were within normal limits intra operatively. The anaesthetist, surgeon and the patients were satisfied. No patient complained of any post operative complications secondary to the anaesthetic.**Conclusion:** Propofol (intravenous) as a supplement to local anaesthesia is a suitable agent to accomplish minor oral surgical procedures. It is safe, effective and comfortable for the surgeon as well as the patient.**Key words:** Propofol, Local anaesthesia, Minor oral surgical procedures.**INTRODUCTION**

The sensation of pain is an unpleasant experience. Surgical pain causes anxiety and fear, this fear and anxiety could lead to more suffering than the pain perse. This is especially true in minor dental procedures. Patients avoid dental care frequently due to fear of pain though they are given pre operative counseling in which they are explained about local anaesthesia or nerve blocks. Anxiety and apprehension towards dental surgical procedures varies from a suppressed fear of pain to a phobia which makes the patient un-cooperative and treatment difficult. Despite various types of local anaesthetics and drugs used patients do experience bouts of anxiety and apprehension. As pain is an unpleasant experience patients avoid dental care. Majority of the oral surgical procedures are day care, nerve blocks may not eliminate anxiety. General anaesthesia is not ideal for minor surgical procedures as it not only increases bleeding but also delays the discharge of the patient. Hence it is essential to add sedation to local anaesthetics for anxiety and pain relief in order to make these procedures more palatable. Various drugs like barbiturates, opioids and scopolamines were used for sedation, rather than full anaesthesia since 1945. Intravenous agents like midazolam, methohexital, thiopentone and ketamines have been used successfully in various dental surgical procedures. With the introduction of propofol by Kay and Rolly in 1977, it seems that the most optimal sedative was obtained. Propofol merits a rapid onset of action and reliable sedation and in combination with local anaesthetic it is a safe alternative to general anaesthesia. Many a drug have been used for conscious sedation but propofol is preferred due to its:

Rapid induction.

Short duration of action.

Maintenance of vital parameters.

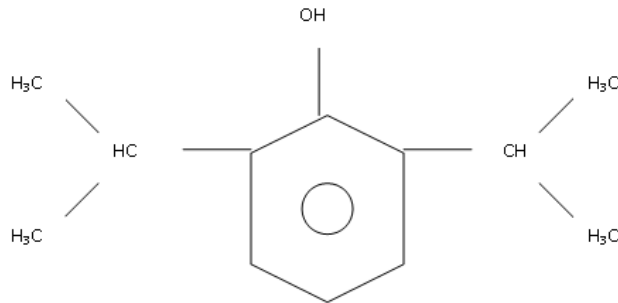
Rapid recovery.

Low incidence of excitatory effects, Jeffery L.A. et al (1993), Edward M.D. et al (2003), Ravi. R .et al (2004).

Hence a study has been undertaken to assess the safety and efficacy of propofol in terms of onset of action, intra-operative conditions, recovery, patients cooperation, surgeons convenience and side effects.

## PHARMACOLOGY OF PROPOFOL

Propofol belongs to the group of alkyl-phenols which possess anaesthetic properties. Propofol (2,6, di-iso propyl-phenol) (Fig-1) is the result of research that began in 1973 in the laboratory of ICI pharmaceuticals in Macclesfield, England. It was branded as “Diprivan” based on the sequence di- iso- propyl intravenous anaesthetic.



**Figure 1: Propofol: 2, 6, di-iso propyl phenol**

It is short acting, rapidly metabolized intravenous anaesthetic with a molecular weight of 178.3 and  $P_{ka}$  of 11. when placed in an environmental  $P_h$  of 11, the drug is 50% dissociated. Propofol can be used both for induction and maintenance of general anaesthesia, sedation during local or regional anaesthesia, and in the intensive care unit as an infusion. Propofol is poorly soluble in water and is highly fat soluble. It is formulated as oil in water emulsion for injection purposes. Initially propofol was solubilized in 15% cremaphor EL solution (poly oxy ethylated castor oil) but the apparent association between cremaphor solvent in propofol and anaphylactic reactions seen in patients led to its temporary withdrawal from clinical use. Propofol was later formulated as a 1% weight/volume solution in milky white aqueous emulsion (intralipid) containing 10% soyabean oil, 2.25% glycerol and 1.2% purified egg phosphatid (lecithin), eliminated the risk of anaphylaxis. Propofol is a weakly acidic anaesthetic agent that is highly bonded to serum proteins, predominantly albumins. The parental drug contains no antimicrobial preservatives and the vehicle may support growth of micro organisms if a contamination occurs. Propofol emulsion is compatible with 5% dextrose, 0.9% sodium chloride and glucose saline solution. Long polyvinyl chloride intravenous tubing may cause a loss of concentration of the drug.

## MATERIALS & METHODS

The present study was conducted in the Department of Oral and Maxillofacial surgery, M.S.Ramaiah Dental College and Hospital, Bangalore. The study included 25 patients of either sex with their age ranging from 10-40 years requiring minor oral surgical procedures like:

- Incision and Drainage of abscess.
- Removal of mini plates and screws treated for jaw fractures.
- Circum mandibular wiring in children for open cap splint fixation.
- Extraction of impacted molars.

The procedure was explained to the patients and a written informed consent was obtained. A record of detailed case history of the patient was maintained with their past exposure to anaesthetics, sedative agents, previous surgical procedures, allergy to drugs and eggs.

Routine blood investigations were carried out and care was taken to include only those patients who came under ASA 1 and 2 category.

## Criteria for selection

- Age group between 10-40 years.
- Only American society of Anaesthesiology risk category 1 and 2 patients were included in the study.
- Patients with no history of hypersensitivity to any of the drugs being used and their constituents were included in the study.
- Patients who were apprehensive and in severe pain and in need to undergo minor Oral and Maxillofacial surgical procedures were included in the study using Corah anxiety scale (> 15).
- Patients with reported history of anaesthetic related complications, pregnant patients, nursing mothers, obese patients, and who were addicted to sedatives, drugs, alcohol, allergic to eggs and local anaesthetics were excluded from this study.

**Premedication:** Patients received 0.6 mg of atropine sulphate intra muscularly half an hour before surgery.

**Anaesthetic management:** Pre medication was followed by injection xylocard 12.5 mg intravenously to alleviate pain caused by propofol.

**Induction of sedation:** Propofol in the dose of 2 mg/kg was given along with 1mg midazolam and fentanyl 50 micro grams for induction of sedation.

**Maintenance of sedation:** Following induction, patient was ventilated with 100% oxygen for 3-5 minutes. Nasal airway was inserted, oxygen was supplemented through the nasal catheter entering into the nasal airway. Maintenance of sedation was achieved with 4-10 mg/kg/hr of propofol and titrated to the required end point of sedation i.e. ptosis and slurred speech.

The study was conducted under the guidance of an experienced anaesthetist. Repeat doses of propofol were given after the signs of waning of sedation like phonation, eye opening and purposeful movement on surgical stimulation. Patients were given local anaesthetic injection of 2% lignocaine with 1:2,00,000 adrenalin solution 5-7 minutes after administration of sedation. Sedation was maintained by means of propofol drip – drip rate was adjusted to the end point of sedation i.e. ptosis and slurred speech. In the event of phonation, gurgling sound, and movement of the limbs, a bolus of 10-20 mg propofol was supplemented.

### Monitors attached

1. Non invasive B.P cuff.
2. ECG.
3. Pulse oximeter.

### Parameters evaluated:

1. Onset time.
2. Degree of sedation.
3. Recovery.
4. Operating conditions and surgeons convenience.
5. Patients assessment of sedation, immediate and 24 hours post operative.
6. Complications.
7. Necessity of any emergency support.

In the operating theatre, the patient was connected to pulse oximeter, ECG monitor, and sphygmomanometer for constant monitoring of pulse, oxygen saturation and blood pressure.

Recordings were made at:

- 15 minutes before surgical procedure.
- 5 minutes after induction and every 10 minutes during surgery.
- 15 minutes after surgery.

**Onset of action:** Onset of action of the drug was calculated by the time elapsed between induction and the onset of the signs of end point of sedation (ptosis and slurred speech).

**Evaluation of degree of sedation:** was assessed by recording any unwanted movement by the patient caused by surgical stimulus and gurgling sounds made by the patient at any point of time during the surgical procedure. It was graded as achieved and not achieved.

**Recovery:** Recovery period was calculated from last dose of the drug to the time when the patient could orient himself to the time, place, and other people.

**Patients assessment of sedation :** was done by immediate post operative and 24 hours after recovery Awareness and Recall Questionnaire and score i.e. if the score was more than 4, it implied that the degree of sedation as not satisfactory, if the score was less than 4, then the degree of sedation was considered satisfactory.

Awareness and Recall Questionnaire:

1. What did you notice? (Table – 1)

**Table 1 Awareness and recall questionnaire**

	YES	NO
SOUNDS		
TACTILE SENSATION		
VISUAL PERCEPTION		
PAIN		
PARALYSIS		

2. Did you feel something in your mouth or throat?

Yes:

No:

3. What went through your mind?

4. Did you believe you were dreaming?

Yes:

No:

5. How long did it last?

Approximately-

6. Did you try to alert any one?

Yes:

No:

7. How was your pre operative mental state?

8. Have there been any consequences?

9. Did you inform the hospital staff?

10. Have you changed your opinion about anaesthesia?

**Operating conditions and surgeons convenience:** The Oral surgeon graded operating conditions at the end of the surgery as satisfactory and not satisfactory.

Criteria being:

- Patient movements.
- Bleeding.

**Complications:** In the post operative period the patient was assessed for any complications such as:

- Cough.
- Nausea / Vomiting.
- Restlessness / Convulsions.

**Accessory support:**

Any necessity for emergency support used was noted like :

- Oxygen supplementation.
- Endotracheal intubation.
- Laryngeal mask airway.

Also cardiovascular adverse effects if any, were looked for :

- Bradycardia.
- Hypotension.
- ECG changes.

## RESULTS

The study comprised of 25 patients of either sex who were sedated with propofol and whose age ranged from 10-40 years. As this was an observational study no statistical comparison was done. The results are presented as average  $\pm$  standard deviation with different time intervals with respect to vital parameters.

**Age and Sex incidence:** The age and sex incidence shows a mean age of 29.04 years and the male: female ratio was 20:5.

**Types of minor oral surgical procedures included:**

52 % of the patients were operated on for impacted tooth (third molar).

20 % of the patients were operated on for plate removal.

16 % of the patients were operated on for fracture of the mandible.

12 % of the patients were operated on for abscess (incision and drainage).

**Duration of surgery:** The duration of surgeries ranged from 30 minutes to 60 minutes with a mean duration of 43.20 minutes.

**Pre-medication:** Inj. Atropine I.M was given half an hour before the surgery time. The dose ranged from 0.2 mg to 0.6 mg with a mean dose of 0.548 mg.

**Onset of action:** The onset of action was assessed with the onset of signs of sedation end points, that is slurred speech and presence of ptosis (verrills sign). The time of onset ranged from 3 – 4 minutes with a mean time of 3.72 minutes.

**Dosage:** The induction dose was 2 mg/kg of propofol. Variation was seen in the maintenance dose of propofol. Maintenance dose ranged from 4 – 10 mg/kg/hr with a mean of 6.52 mg/kg/hr. 1 mg midazolam and 50 micro grams of fentanyl was given to all the patients during induction of sedation.

**Level of sedation:** Level of sedation was assessed by the anaesthetist and was graded as adequate or inadequate depending on any kind of phonation, gurgling sounds or movement of the limbs made by the patient intra operatively. 96 % of the patients had adequate level of sedation as they were cooperative and asleep during surgery. 4 % of the patients showed inadequate level of sedation as they had gurgling sounds and movement of the limbs.

**Surgeon's convenience:** Surgeons convenience was graded as satisfactory and not satisfactory depending on bleeding and patients limb movement's intra operatively. 96 % of the patients ranked satisfactory and 4 % ranked unsatisfactory according to the surgeon.

**Patient's satisfaction:** Patients satisfaction was assessed by immediate post operative and 24 hours post operative Awareness and Recall Questionnaire by the patients. The maximum score was 8. If the score was more than 4, it was graded as not satisfactory and if it was less than 4 it was graded as satisfactory. 96 % of the patients were satisfied and 4 % came under the not satisfactory group.

**Side effects:** In 96% of the patients there was no significant fall in blood pressure, pain on injection or limb movements. Only 4 % of the patients had pain, and aggressive movements of the limbs, which needed Inj. ketamine 25 mg (1 mg/kg) supplemented with a bolus dose of 10-20 mg of propofol. With this surgery was accomplished but for the study purposes it was considered as failure.

**Emergency support:** There were no incidences of any serious complications intra operatively and post operatively which necessitated the use of any emergency equipment or ventilatory support.

**ECG:** The electro cardiogram was assessed by the anaesthetist throughout the procedure. Arrhythmias of any kind were not noticed.

**Blood pressure:** A noticeable fall in blood pressure was observed intra operatively at 10 and 20 minute intervals. The mean systolic pressure at 10 and 20 minute intervals was 117.2 mm/hg with a standard deviation of  $\pm 7.37$  to 6.78, and a range of 110-140 mm/hg. The mean diastolic pressure at 10 and 20 minute intervals was 73.2 to 75.2 mm/hg with a standard deviation of  $\pm 5.57$  to 5.10 and a range of 70-90 mm/hg. None of the patients required any medication intra operatively as this was clinically not significant and required no treatment. In all the patients the systolic, diastolic and mean arterial pressures returned almost to baseline at the time of discharge.

**Heart rate:** There was no significant change in heart rate after administration of propofol or intra operatively, which ranged between 74-110/minute.

**Oxygen saturation:** Oxygen saturation was measured from a pulse oximeter and there was no significant change between pre drug and post drug values as the patients were well ventilated with 100 % for 2-3 minutes after induction and supplemented with oxygen through the nasal catheter entering into the nasal airway. The range was between 96 % - 99 %.

**Respiratory rate:** There was no significant variation seen in the respiratory rate, pre operatively, intra operatively and post operative stage. Respiratory rate ranged from 14-22 times/minute.

Other side effects like pain on injection, anaphylactic reactions, post operative nausea and vomiting, post operative infections and headaches were not reported in this study.

**DISCUSSION**

Often minor oral surgical procedures can be accomplished under local anaesthetic blocks, but apprehension on the part of the patient's leads to inconvenience to the patient as well as the surgeon, further the increase in blood pressure secondary to apprehension may make the surgical field bloody. Larry.P.P. et al (1998) stated that intravenous sedation or general anaesthesia is indicated for relief of anxiety associated with outpatient dental surgery. Conscious sedation is a method of depression of the central nervous system that allows the operator to perform a surgical procedure during which the patient retains protective reflexes.

In combination with local anaesthesia, it is safe alternative to general anaesthesia for the control of peri operative pain and anxiety in outpatient dental surgery. Sarasin .et al (1996) stated that intravenous sedative hypnotics are commonly used during oral surgery procedures performed under local anaesthesia to enhance patient comfort, improve operating conditions, and prevent recall of unpleasant events during the operation. Their study compared the effects of midazolam and propofol on explicit and implicit memory, cognition and psychomotor function in patients undergoing oral surgical procedures with local anaesthesia and conscious sedation. They have concluded that midazolam and propofol generally produced equivalent impairments, but the duration of the effects of propofol was shorter.

The advancement in the pharmacology and anaesthesiology dictates us to adopt safe and alternative sedative techniques for minor oral surgical procedures, so that patient feels comfortable, confident to undergo such procedures and the surgeon would be satisfied to work in a controlled environment. Wylie (2003) states that for over 50 years, thiopental was the standard anaesthetic drug used to induce anaesthesia. Study of the structure activity relations of barbiturates derivatives and the physiologic modeling of the disposition of thiopental and methohexital profoundly influenced understanding of the pharmacology of fast acting intravenous drugs. However propofol now holds this pivotal position, with a kinetic and dynamic profile closer to the ideal – suitable for short and prolonged use for both anaesthesia and sedation and a good vehicle for bringing to a wide audience new thinking about intravenous anaesthesia and new techniques notably target controlled infusion. Larry P.P .et al (1998) measured the safety and efficacy of propofol combined with fentanyl as sedative agents during third molar outpatient surgery. They concluded that propofol appears to be a safe and efficacious drug for use during outpatient oral surgical procedures. Milan N. P. et al (1996) in their study titled “Propofol: Alternative general anaesthetic for outpatient oral surgery.” compared propofol with methohexital for use in the outpatient general anaesthesia for oral surgery procedures. They concluded that propofol is a suitable agent for induction and maintenance of general anaesthesia for out patient oral surgery procedures. It provides a smooth induction of anaesthesia with few excitatory effects. Christopher J. M. et al (1994) in their study titled “Comparison of propofol and methohexital for deep sedation.” Stated that the use of intravenous conscious sedation to facilitate ambulatory dento alveolar surgery is an integral part of the practice of oral and maxillo facial surgery. In conjunction with regional anaesthesia deep sedation promotes patient comfort and compliance while allowing for the maintenance of consciousness and protective reflexes. They compared two sedation techniques for use in the outpatient third molar surgery and concluded that propofol is superior to methohexital for intravenous sedation.

In our study we made an effort to study the feasibility and effect of intravenous propofol for minor oral surgical procedures, its properties in terms of onset of action, induction and maintenance doses of sedation, vital parameters, level of sedation, surgeon’s convenience, patient’s assessment and side effects were assessed.

In a study conducted by Meckenzie. N et.al (1985) onset of action of propofol ranged from 29.77 to 31.43 seconds, by Peter S. S. (1989) from 22 to 125 seconds, by Joseph E. C. (1999) it was less than 40 seconds, by Chandra R. et al (2004) from 2 to 13 minutes, in our study the onset of action ranged from 3 to 4 minutes with a mean of 3.72 minutes and a standard deviation of  $\pm 0.46$  which is in the similar range to the studies conducted above. The induction dose of propofol in our study was 2 mg/kg for all the patients, this dosage corroborates with studies conducted by various authors like Kirkpatrick.T. et al (1988) induction dose range of 2 mg/kg to 2.5 mg/kg, Claeys.M.A .et al (1988) induction dose of 2 mg/kg, Peter S. S. (1989) induction dose range of 1.25 mg/kg to 2.5 mg/kg, Milan N. P. (1996) induction dose of 2 mg/kg, Joseph E. C. (1999) induction dose range of 1mg/kg to 2.5 mg/kg and Sharon Y. K. (1992) induction dose of 2 mg/kg.

According to different studies conducted by various authors the maintenance dose of propofol ranged from 4 to 10 mg/kg/hour – Tsunehisa T.et al (1998), by Jeffery B.et al (1998) it was established at 6 mg/kg/hour, how ever the final mean rate was  $5.7 \pm 0.19$  mg/kg/hour, with a range of 4.2 to 7.86 mg/kg/hour, by Browne B.L.et al (1992) it ranged from 6 to 9 mg/kg/hour and by . Claeys.M.A. et al (1988) it was 6 mg/kg/hour. In our study the maintenance dose of propofol was in the range of 4 to 10 mg/kg/hour with a mean of 6.52 and a standard deviation of  $\pm 1.94$  which is similar to the above mentioned studies.

Jeffery B. et al (1998) have defined the significant fluctuations in cardiovascular and respiratory parameters as :

1. Changes in the heart rate exceeding 20 % of baseline persisting for greater than 30 seconds.
2. Changes in blood pressure exceeding 20 % of baseline on two consecutive measurements taken at 3 minute interval.
3. A decrease in oxygen saturation less than 92 % persisting for 15 seconds and
4. Apnea requiring positive pressure ventilation.

In our study there was no statistically significant variation seen in heart rate intra operatively in any of the patients which corroborates with the studies of Kevin J. M. et al (1994) and Claeys. M.A .et al (1988) , it can be attributed to depression of baroreflex sensitivity by the intravenous propofol and resetting the heart rate at lower arterial pressures or a slower heart rate despite decreased arterial pressures. Chirstopher J. M .et al (1994) in their study stated that increased heart rate results from a number of factors including the small doses of propofol administered, surgical stimulation leading to endogenous catecholamine release, and exogenous catecholamine administered with the local anaesthetic. There was no significant increase in heart rate when a local anaesthetic was administered in our study, which could be attributed to the strength of adrenaline which is 1:2,00, 000 as compared to 1:100,000 which was used in the above mentioned study. There was no significant variation in heart rate in any of our patients seen on injection of propofol which corroborates with the study of Peter S. S. et.al (1989).

None of the patient's blood pressure in our study had any changes exceeding more than 20 % of the baseline values which was defined by Jeffery B. et al (1998) and also corroborates with the study done by Zacharias. M. et al (1998) . According to Wylie (2003) this could be because of two reasons, one is if there is adequate pre operative hydration and the other reason is slow, controlled titration of propofol dose to achieve the desired effect, which was employed in our study. However in studies done by Peter S. S. et.al. (1989) they observed statistically significant decrease in systolic blood pressure of approximately 30 % and also in studies done by Claeys M.A .et al (1988) who reported a significant decrease in systolic arterial pressures in the range of 19 % to 30 %. Many authors attribute several reasons to hypotension produced by propofol. According to Wylie (2003) it is concentration dependent decrease in arterial blood pressure, Joseph E. C. (1999) states that propofol shows a simultaneous decrease in heart contractility (negative inotropy) and after load reduction which leads to hypotension, Mackenzie.N (1985) speculate that propofol induced hypotension is mediated by an inhibition of the sympathetic nervous system and impairment of the baroreflex regulatory mechanism, Li et al (1997) postulate that the disturbance in  $Ca^{2+}$  transport and availability may cause a decrease in energy production and produce propofols negative inotropic effect. Claeys M.A and co workers (1988) concluded that the major haemodynamic effect of propofol was a decrease in arterial pressure and that blood pressure decreased because of lowered systemic vascular resistance and not because of reduced stroke volume or cardiac output. One of the other most important reason for no changes in the blood pressure of the patients in our study could be because as Joseph E. C. (1999) states continuous infusion of propofol at variable rates minimizes the peaks and volleys of blood concentrations of intravenous anaesthetics that are seen with incremental bolus techniques. By maintaining a constant plasma concentration of propofol, this technique decreases the amount of drug administered, stabilizes the level of anaesthesia, and shortens recovery time. Continuous infusion of propofol minimizes the risks of hypotension and bradycardia and produces haemodynamic stability, which corroborates with the similar technique which was employed for all the patients in our study.

Arterial oxygen desaturation has always been a significant cause of concern during minor oral surgical procedures under local anaesthesia alone or in combination with sedation. The reasons attributed according to Zunal K. et al (2004) are apnoea and hypoventilation. Joseph E. C. (1999) states that propofol produces dose dependant respiratory depression with apnoea and is relatively minor and can be well managed if they are properly monitored. Wylie (2003) also states that apnoea is common following an induction dose of propofol, the incidence and duration depend upon the dose and rate of administration of propofol and synergistic effects of opiates or sedative premedication. In our study none of the patients oxygen saturation percent fell below 96 %, nor any patients experienced apnoea (a period of breathless ness greater than 30 seconds) requiring positive pressure ventilation. This corroborates with studies done by Milan N. P. et al (1996) (oxygen percent saturation not < 90 %), Jeffery B. et al (1998) (oxygen percent saturation not < 92 %), Larry P. P. (1998) (oxygen saturation, average remained above 99 %), and Chirstopher J. M. et al (1994) (oxygen saturation in the range of 98 % to 100 %). We can attribute two reasons for maintenance of oxygen saturation in our study, all the patients received 100 % oxygen during induction for 3-5 minutes and also continuous supplementation of oxygen through the nasal airway throughout the surgical procedure.

Despite the fact that propofol is thought to cause respiratory depression, there was no significant changes in the respiratory variables during the study, which in our case was respiratory rate. There was no significant decrease in respiratory rate in all our patients, which corroborates with other studies done by various authors like Zacharias. M. et al (1998), Larry P. P .et al (1998), Stokes D.N. et al (1991) and Peter S. S .et al (1989). However according to Peter S. S. et al (1989) different studies reported changes in respiratory rate as variable or decreased, non invasive measurement of the respiratory cycle (induction plethysmography and the pneumotachography) have demonstrated that propofol causes significant decreases in tidal volume, mean inspiratory flow rate, and functional residual capacity.

The changes in breathing pattern may suggest that the ventilatory depression of propofol results from a decrease in central inspiratory drive as opposed to a change in central timing. In our study we can attribute continuous surgical stimuli during the course of surgery could have counteracted the ventilatory depressant effect of propofol which corroborates with the studies of Zacharias.M. et al (1998) and Peter S. S . et al (1989).

Level of sedation was assessed by the anaesthetist and was rated as adequate and not adequate depending on whether the patients exhibited any kind of phonation or gurgling sounds intra operatively. 96 % of the patients level of sedation was rated as adequate and 4 % was rated as inadequate, the anaesthetist evaluation of the level of sedation could be biased as he/she was not blinded to the anaesthetic agent in this study.

In our study surgeons convenience was rated satisfactory depending on whether the patients had any limb movements or excess bleeding intra operatively. 96% of the patients who were operated came under the satisfactory and 4 % of them under the unsatisfactory category. This preference of the surgeon could be attributed to the fact that the surgeon was not blinded to the anaesthetic agent used in this study even though these 4 % of the patients had excessive limb movements.

Patients evaluation and satisfaction in our study was assessed by all the patients by immediate post operative and 24 hours post operative Awareness and Recall Questionnaire Wong J et.al (2002). It was graded as satisfactory and unsatisfactory. 96% of the patients were satisfied and 4 % of the patients were not satisfied. One of the reason that can be attributed to these 4 % of the unsatisfied patients could be pain intra operatively which corroborates with the study done by Kevin J. M. (1994) . He also states that that it was not only the dosage of the premedication agents that was causing patients to move during the procedure, one must also consider inadequate level of regional anaesthesia , when referring to patients who displayed excessive movements. It is impossible to obtain the patients subjective report of the level of nerve blockade in the sedated patients. The failure of action of regional anaesthesia could also be because of alteration in the tissue  $P_h$  which alters the effect of local anaesthetics especially so in infected and inflamed tissues.

## CONCLUSION

Minor oral surgical procedures can be accomplished using intravenous propofol as a supplement to local anaesthesia. This technique is safe, effective and comfortable for the surgeon as well as the patient.

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