

Effectiveness of propofol in day care short surgical procedures – A hospital based longitudinal study

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Abstract

Present study was conducted to study the use of Propofol as a total intravenous anaesthetic agent in short surgical day care procedures. A hospital based longitudinal study was conducted with total 50 patients in the department of Anaesthesiology, SSG Hospital, Vadodara. Fifty patients between ages of 15 to 65 years were enrolled for the study. All patients were gone through short surgical procedures with Propofol intravenous anesthetic agent. Propofol has a tremendous potential for use in ICU sedation, MAC sedation and sedation during procedures under regional anesthesia. Hence it became very popular for day care surgeries or outpatient anesthesia.

Keywords:

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INTRODUCTION

Administration of a suitable drug by the intravenous route has always played a very major role in the progressive growth of anaesthesia. Nearly four centuries after Christopher Wren's pioneering attempt at an intravenous injection in man which accidentally produced unconsciousness, the medical fraternity is still experimenting and trying to improvise on new drugs and techniques which will make anaesthesia more and more acceptable to the patient. There has been growing concern regarding pollution of the operation theatre with anaesthetic gases from the fear to cause harm from their inhalation during the working period in the theatre. Therefore use of total intravenous anaesthesia has been recommended to avoid theatre air pollution.¹ In recent years, the idea of faster recovery and early discharge has become extremely popular so much so that can be described in the history of anaesthesia as the era of

outpatient anaesthesia. The ability to deliver safe and effective anaesthesia with minimal side effects and rapid recovery is critically important to ensure safe and early discharge. Propofol, a non-barbiturate intravenous anaesthetic is a result of systemic investigation by the department of clinical research at the laboratories of ICI pharmaceuticals. The discovery of anaesthetic activity of alkyl phenol was by James and Glen (1980) and from that emerged the hindered phenol^{2,6} – diisopropyl phenol, which was first known as ICI 35868. General anesthesia (GA) should provide quick and pleasant induction, predictable loss of consciousness, stable operating conditions, minimal adverse effects, rapid and smooth recovery of protective reflexes and psychomotor functions. This study was conducted to evaluate and compare two drug combinations of TIVA using propofol-ketamine and propofol-fentanyl and to study the induction characteristics, maintenance of anesthesia and recovery characteristics following anesthesia with these techniques. The development of anesthesia since its introduction has been erratic, long periods of stagnation being occasionally broken by improvement and advances. General anesthesia has undergone a vast number of improvements and modifications and even its recently modified form total intravenous anesthesia (TIVA; induction as well as maintenance of anesthesia with intravenous agents only) has undergone many improvements ever since its introduction into clinical practice. Till recently, inhalational agents have remained the routine choice for maintenance of anesthesia. One of

the principle reasons is the availability of sophisticated delivery systems for volatile anesthetics, which allows the anesthetists to have a fine degree of control on the concentration administered to the patient. Moreover, monitoring systems that permit nearly accurate measurement of end-tidal concentration of the volatile anesthetics as well as the introduction of new potent volatile agents provide a wider choice of drugs. Various drugs have been tried from time to time in TIVA. Since no single drug can provide all the characteristics of an ideal intravenous agent, several drugs are used in different combinations to provide balanced anesthesia in TIVA, that is, amnesia, hypnosis and analgesia. Massey M J *et al* studied the use of propofol infusion for maintaining hemodynamic stability during cardiac anaesthesia.² Cheong *et al* studied the effects of anaesthesia technique and concluded that there is a great amount of depression of thermoregulatory response by propofol which allowed tolerance to core temperature.⁽³⁾ Dewd N P *et al* concluded that low incidence of intra operative awareness in cardiac surgeries is seen when propofol is used as the intravenous anaesthetic agent before, during and after cardiopulmonary bypass.⁽⁴⁾ Johnston R *et al* concluded that there is a synergy between propofol and alfentanil and that combining alfentanil with propofol is associated with faster earlier recovery.⁵ Study by Hemani A *et al* showing propofol used with ketamine have lesser side effects more economical options which provide adequate depth of anaesthesia.⁶ Julie G *et al* have carried out a comparison of propofol ketamine and fentanyl. Study concluded that sedation and recovery times were shorter with propofol than with ketamine or fentanyl versed.⁷ Richa *et al* compare two anaesthetic techniques in obese patients.⁸

MATERIAL AND METHODS

Present study was conducted to study the use of Propofol as a total intravenous anaesthetic agent in short surgical day care procedures. A hospital based longitudinal study was conducted with total 50 patients in the department of Anaesthesiology, SSG Hospital, Vadodara. Fifty patients between ages of 15 to 65 years were enrolled for the study. All patients were gone through short surgical procedures with Propofol intravenous anaesthetic agent. Ethical clearance from college central ethics committee was taken before starting the study.

Aims of the Study

1. To study the amount of Propofol required for completely abolish corneal reflexes.
2. To see the hemodynamic changes during induction, intraoperative and postoperative period.
3. To observe respiratory pattern.

4. To study any local and systemic side effects intraoperatively and postoperatively.
5. To observe the time taken for recovery and recovery characteristics.

Inclusion Criteria

1. Age group 15-65 years
2. ASA physical status grade I and II

Exclusion Criteria

1. Patients with age less than 12 years
2. Pregnant women
3. Patients with ASA grade III or IV

All patients were belonging to ASA physical status grades I and II. Out of total, there were 38 male and 12 female patients. 5 memory cards were shown to the patient in pre anaesthetic check up. All the patients' pre medicated with Injection Atropine 0.01 mg/kg intramuscularly 30 to 45 minutes before induction of anaesthesia. All patients were given Injection Tramadol 2 mg/kg intravenously 10 to 15 minutes before surgery. Injection Xylocard 2% 1 CC was given to all before injecting Propofol. All patients were induced with injection Propofol 2-2.5 mg/kg maintained throughout operation according to the sliding scale.

RESULT AND DISCUSSION

In present study all parameters and variables studied and analyzed using statistical tests. Majority (52%) of the patients were in 46-65 years of age. Mean age of the patients was 41.48 with SD of 18.7 years. About 72% of patients were male. 56 percent of patients had ASA status I whereas 44% had ASA status II. Maximum patients belong to general surgical procedures. Table – 1 shows change in pulse rate at 1 and 3 minutes and at the end of operation but it is not statistically significant (p-value >0.05). Blood pressure was fall at 1 and 3 minute as well at the end of operation as compared to preoperative reading. Results of paired t-test showed it not significant (p-value >0.05). Mean RPP is also reduced at the end of operation but it is not statistically significant (p-value >0.05).

Table 1: Comparison of preoperative, intra operative and postoperative hemodynamic variables

Time	Pulse Rate	SBP	Rate Pressure Product
Pre operative	92.87±17.9	122.39±22.06	11576.86±2183.51
1 min	89.27±18.9	110.30±19.45	-
3 min	91.30±18.3	112.46±20.92	-
Post operative	91.55±18.8	113.45±21.51	10813.52±1889.07

Mean duration of surgery was 6.62 minutes. Mean dose of propofol was 202.60 mg. maximum dose of propofol

was 300 mg. Major post operative complications are given in table – 2 below.

Table 2: Post Operative Complications

Complications	No. of patients	Percentage (n=50)
Pain on injection	01	02
Apnea	07	14
Excitatory movement	03	06
Bradycardia	04	08

Preoperative complications during conduction of cases were pain on injection, apnea, excitatory movement and bradycardia. None of the patients developed oxygen desaturation intraoperatively and postoperatively. None of the patients had shivering and postoperative nausea and vomiting. Most of the patients response to painful stimuli and verbal command within 1 to 8 minutes. Mean time for response painful stimuli was 2.78 ± 0.72 minutes. Mean time for response to verbal command was 5.7 ± 1.3 minutes. 80 percent of patients are oriented within 10 ± 2.7 minutes of completion of surgery. The loss of consciousness was achieved in about 24.0 ± 7.1 seconds in study by Sear *et al.*¹⁰ Mean orientation time was 10 minutes. Mean steward score at 10 minutes was 3.8 ± 0.5 whereas it was 6.0 ± 0 at 20 and 30 minutes. Mean time to identify picture card was 31.50 ± 9.64 minutes. 54 percent of patients were able to recall within 30 minutes. The mean induction time for propofol in present study was 32.0 ± 7.3 seconds whereas it was 36.0 ± 8.0 seconds in study by Hunter *et al.*⁹ Propofol is a cardiovascular depressive drug affecting heart rate and blood pressure.¹¹ In present study 2% of patient developed pain on injection. Incidence of pain on injection is less because we chose larger veins, used 2% xylocard 1 cc and emulsion form of proposal. Apnea on induction was the most significant feature in propofol lasting longer than 30 seconds.¹¹ None of the patients had shivering in our study. Even otherwise propofol is known to produce less postoperative shivering.¹² This in perhaps because of greater depression of thermoregulatory responses allowing tolerance of core hypothermia.

CONCLUSION

All patients were assessed for discharge and were ready to be discharge in significantly shorter time. None of our

patient required any drug PONV and postoperative pain. Follow up was uneventful and the study evoked a lot of interest among both surgical and anaesthetic colleagues. When propofol was used as a total intravenous anesthetic agent without Nitrous Oxide, there was slightly higher requirement of the drug but quicker emergence from anesthesia. As discuss above recovery is very much faster with propofol. On globe evaluation recovery profile of propofol is superior and appears to be an agent for induction and maintenance of short surgical cases in day care procedure.

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