Intravenous Propofol infusion for Sedation in Spinal anaesthesia: A Clinical Study

Kulkarni Vandana Sharashchandra, M D, Sajjan Prashant Shivaraj, DA, DNB, IDCCM (Critical Care Medicine)

Author affiliations
1,2 Assistant Professor, Department of Anaesthesiology, Sri Siddhartha Medical College, Agalakote, Tumkur-572107 (Karnataka – India)

Address reprint requests to Dr. Sajjan Prashant Shivaraj, Assistant Prof in Anaesthesiology, H NO- 35, Staff Quarters, SSMC Campus, Sri Siddhartha Medical College, Agalakote, Tumkur-572107, Karnataka – India or at drdrdrprashant@rediffmail.com

Abstract: The present study was carried out to evaluate the efficacy of intravenous propofol for sedation in spinal anaesthesia; to study the patient’s hemodynamics and respiratory condition during the procedure and to observe for complications if any. Spinal anaesthesia was given, once adequate level of anaesthesia was obtained and patient was hemodynamically stable, intravenous propofol was administered. Initially propofol was given in a bolus dose of 1 mg/kg body weight followed by infusion of 2mg/kg/hr in order to sedate the patient. With the present study, we can summarize that propofol can be used safely and effectively for sedating patients undergoing procedures under spinal anaesthesia. It provides quick onset of sedation with rapid, clear headed recovery with minimal side effects.

Key words: Propofol; sedation; spinal anaesthesia.

INTRODUCTION

Spinal anaesthesia is one of the simplest and commonest regional anaesthetic technique. However an awake patient may be very anxious throughout the course of surgery. Any concern about the patient being awake during the operation can be assuaged and the patient reassured that adequate sedation can be given to decrease anxiety and ensure comfort. Intravenous sedation is most widely used method for anxiolysis. Midazolam and propofol are the most suitable drugs.

OBJECTIVES
1. The study is carried out to assess sedation with intravenous propofol for cases, which are carried out under spinal anaesthesia by using sedation score (Wilson Sedation Score).
2. To observe for hemodynamic and respiratory changes during the procedure.
3. To observe for complications during the procedure.

METHODOLOGY

After obtaining Ethical Committee clearance, 100 ASA I and II patients belonging to either sex, aged between 20–50 yrs, undergoing elective surgeries under spinal anaesthesia were included in the study. Preeanaesthetic evaluation was done on the previous day of surgery. Consent for study and anaesthesia was obtained. Intra operatively patients were connected to ECG, pulse oximetry and NIBP. Emergency drugs and airway cart were kept ready. Preoperatively patient’s vital parameters like pulse, blood pressure, respiratory rate, SPO₂ were recorded. An 18 G intravenous cannula was secured. Adequate preloading done with ringer lactate solution. Under strict aseptic precautions, spinal anaesthesia was produced by an intrathecal injection of 0.5 % injection Bupivacaine heavy via a 25 G spinal needle in the lumbar region. Adequate level of sensory block for the proposed
surgery was achieved. All patients were given supplemental oxygen at 2 L/min via nasal cannula until the end of surgery. Hypotensive episodes were treated with IV mephentermine and bradycardia with injection Atropine 0.6 mg iv. Sedation was started with bolus dose of injection propofol at 1 mg/kg. Time of onset of sedation was assessed. The onset of sedation was noted when patient was sleeping with eyes closed and responding to verbal commands. Sedation was maintained throughout the procedure with propofol infusion via syringe pump at a dose of 2 mg/kg/hr. The sedative infusion was discontinued just prior to the anticipated end of the procedure. Intraoperative side effects like, pain on injection, nausea, vomiting, involuntary movements, muscle twitching and apnoea were noted.

During the whole procedure patient’s pulse, blood pressure, respiratory rate, sedation score were recorded at an interval of 5 min. The level of sedation, pulse, blood pressure, respiratory rate were recorded. The time of onset of sedation was 39.34 + 7.22 seconds. Mackenzie and Grant I S performed a study in 1985 with propofol in regional anaesthesia and found the time of onset of sedation to be approximately 30 seconds. Osborne et al.5 in 1985 conducted a study with propofol in regional anaesthesia and found the time of onset of sedation to be 63.33 + 5.58 kg were included. The average time of onset of sedation that is the time of start of sedation was 6.5 + 3.1 minutes. 4 patients had recovery time of 4 - 5 min. Average time of recovery from sedation was 2.8 + 0.5 min.

RESULTS

The mean age for the study group was 37.91 + 9.5 years. The male to female ratio was 4:1. The time of onset of sedation was 30–40 sec for 60 cases, 41–50 sec for 38 cases and 50–60 sec for 2 cases. The average time of onset of sedation was 39.34 + 7.22 seconds. There was a decrease in pulse rate after propofol infusion. The average reduction in pulse rate was 1.51 + 0.16 beats/min. A fall in both systolic and diastolic BP was noted during propofol infusion. The average reduction in systolic blood pressure was by 9.74 + 0.52 mm Hg. The average fall in the diastolic blood pressure was by 7.11 + 1.58 mm Hg Maximum reduction in systolic and diastolic blood pressure was noted after the bolus dose.

The average reduction in respiratory rate during sedation was by 1.25 + 0.11 breaths / min. Airway obstruction was obtained in 4 patients after bolus dose of propofol, which responded to jaw thrust manoeuvre. Sedation level was assessed and scoring done according to Wilson sedation Score. In this study, total scoring ranged between 3-5. Patients were deeply sedated after bolus dose and with continuous infusion patients were sedated with eyes closed and responding to verbal commands.3 The recovery time was 2–3 minutes for 80 patients. 16 patients recovered within 3–4 minutes. 4 patients had recovery time of 4 - 5 min.

Intraoperative amnesia was present in 60 patients while 40 patients had some intraoperative awareness which consisted of background theatre noise, but none found it distressing. Undesirable effects and complications during and after sedation were noted. 12 patients had pain on injection, during bolus dose of propofol. 4 patients developed respiratory obstruction which could be relieved by jaw lift. There were involuntary movements in 4 patients. 2 patients developed severe cough.

DISCUSSION

Drug induced amnesia for an event during anesthesia is often considered beneficial. The pharmacokinetic properties and recovery characteristics of propofol have led to its study for sedation during spinal anaesthesia. In the present study 100 patients of ASA I and II with mean age group of 37.91+9.50 years and mean weight of 63.33+5.58 kg were included. The average time of onset of sedation that is the time of start of propofol injection to the time when the patient became fully conscious with place, person and ability to recall name was noted. Intraoperative amnesia was assessed by asking the patient to recall some of intraoperative events in the postoperative period.

WILSON SEDATION SCORE:

1. Fully awake and oriented.
2. Drowsy.
3. Eyes closed but arousable to command.
4. Eyes closed but arousable to mild physical stimulation.
5. Eyes closed but unarousable to mild physical stimulation.

After the propofol infusion was stopped, patient’s level of sedation, pulse, blood pressure, respiratory rate were recorded. The time of recovery from stoppage of infusion to the time when patient became fully conscious with place, person and ability to recall name was noted. Intraoperative amnesia was assessed by asking the patient to recall some of intraoperative events in the postoperative period.
pressure decreased by 7.11+1.58 mmHg. Blake D W et al. in their study noted at fall in systolic pressure of 10+4 mmHg and fall in diastolic blood pressure of 4+2 mmHg. A decrease in respiratory rate in a range of 1.25+0.11 breaths/min was observed in our study. Wilson E et al.10 found no change in respiratory rate in their study. In a study conducted by Irwin et al.11 a decrease in respiratory rate by 2 breaths/min observed.

In the present study, the level of sedation was assessed by using Wilson score. The level of sedation was observed in the range of 3–5. The sedation score was 4-5 immediately after bolus dose and was 2-3 throughout the infusion period. In the present study, the time of recovery from sedation, that is from the time the propofol infusion was stopped to the time when the patient becomes conscious to time, place, person and was able to recall name was observed to be 2.80+0.50 minutes. In a study conducted by Bagchi D12 et al. the recovery time was 7.54+3.7 min. However their infusion dose of propofol was more that is 3 mg/kg/hr. Intraoperative amnesia was observed in 60% of patients in our study. 40% of patients had some intraoperative awareness consisting back ground noise. Osborne et al.8 observed intraoperative amnesia in 63% patients. Complications like pain on injection (12%), involuntary movements (4%) and severe cough (2%) were observed in our study. Pain on injection was observed during bolus dose but subsided later. No incidents of Intraoperative or postoperative nausea and vomiting were noted in any of the patients.

CONCLUSION
Intravenous propofol in a bolus dose of 1 mg/kg followed by continuous infusion of 2 mg/kg/hr produces effective sedation with rapid onset and rapid clear headed recovery. It produces minimal hemodynamic and respiratory alterations and has few side effects. Thus, sedation with intravenous propofol can be used safely in cases performed under spinal anaesthesia.

REFERENCES
6. Patki A, Shelgaonkar VC. A comparison of equisedative
Infusions of propofol and Midazolam for conscious sedation during spinal anaesthesia – a prospective randomized study.


Article citation:

Disclaimer:- Any views expressed in this paper are those of the authors and do not reflect the official policy or position of the Department of Defense.

Source of support: None

Competing interest / Conflict of interest
The author(s) have no competing interests for financial support, publication of this research, patents and royalties through this collaborative research. All authors were equally involved in discussed research work. There is no financial conflict with the subject matter discussed in the manuscript.

Disclosure forms provided by the authors are available with the full text of this article at jmrp.info