Current Sedation Practices in Procedures under Spinal Anaesthesia (SA)

Minal Harde¹, Mrida A. Jhingan², Pinakin Gujjar³

ABSTRACT

Introduction: Peri-operative anxiety and stress associated with procedures under spinal anaesthesia (SA) is common and sedation may help improving compliance of the patient and quality of SA. There is no standard sedation protocol for SA. Study aimed to observe the various sedation protocols practiced in our institute during SA with regard to drugs used and their dosages, sedation levels, effect on the duration of SA and to assess the patient satisfaction level.

Material and methods: This was a prospective observational study comprised of patients undergoing elective surgeries under SA. IV sedation was given as per the attending anaesthesiologist’s discretion after SA. We noted hemodynamic parameters, RSS, two-dermatomal regression time, Patient satisfaction scores etc. Epi Info 7.2 software was used for statistical analysis.

Results: Total 500 patients received Dexmedetomidine (189), Midazolam (301) and Propofol (10) as IV sedation. Mean time required for regression of two-dermatomal sensory levels and for rescue analgesia requirement was prolonged in Dexmedetomidine (121.64, 203.75 mins resp.), as compared to Midazolam and Propofol. Mean Ramsay Sedation Score (2.4-3) and Patient satisfaction scores (6-7.5) were comparable in all the drugs. Hemodynamic parameters were stable and comparable. No hypotension, respiratory depression seen except bradycardia (HR<50) noted in 4 patients of Dexmedetomidine.

Conclusion: Drugs used for sedation in 500 patients were Dexmedetomidine, Midazolam and Propofol. All the drugs provided optimum sedation without respiratory depression with stable hemodynamics and good patient satisfaction. In addition, Dexmedetomidine increased durations of sensory anaesthesia and post-operative analgesia.

Keywords: Sedation, Spinal Anaesthesia (SA), RSS, Patient Satisfaction

INTRODUCTION

Spinal anaesthesia (SA) is a very commonly used procedure in modern day anaesthesia practice. It has many advantages like cardiovascular and respiratory stability, preservation of protective airway reflexes, rapid postoperative recovery and early family contact.¹ Few drawbacks associated with SA are sympathectomy, fear and anxiety associated with the procedure and needles, recall and awareness during the surgical procedure.¹² Literature mentions that patients are often disinclined to be completely awake during procedure under SA and other regional anaesthesia (RA). Sedation and anxiolysis may improve patient’s compliance and the advantages of SA may be fully appreciated. Advantages of sedation in SA as mentioned by authors in various studies are providing anxiolysis, sedation and amnesia increasing patient satisfaction and reducing postoperative recall.¹³ Sedation helps to increase comfort, especially during uncomfortable positioning and decrease the stress responses to surgery and anaesthesia and may help prolong the action of SA. Sedation has been shown to improve patient satisfaction during regional anaesthesia (RA) and thus, may be considered as a means to increase the patient’s acceptance of procedures under SA.⁵⁻⁸

Drugs used for intravenous (IV) sedation include benzodiazepines such as Midazolam; alpha agonists such as Dexametomidine and Clonidine; anaesthetic drugs like Propofol and Ketamine in subanaesthetic doses; and opioids such as Fentanyl, Remifentanil and Pentazocine.⁴ Many authors have studied variety of sedative drugs in SA and other RA and some found Propofol and Ketamine combination is best, others discovered Remifentanil infusion as very good. Some authors have found Dexametomidine as best agent for sedation under SA while others has mentioned Midazolam and Propofol are of choice.³⁻¹⁰ However there is no consensus among authors and no standard ideal sedation protocol to be used in SA and these drugs are being used as per the attending anaesthesiologist’s discretion.

In our Institute IV sedation in SA is given in some procedures at attending anaesthesiologist’s discretion and no particular protocol is followed. Literature mentions awareness and anxiety during RA may lead to patient dissatisfaction and they may perceive it as low quality of anaesthesia as patient’s perception regarding general and RA is not clear.²⁻⁶ In today’s era enhancing patient-doctor relationship being an important consideration and improvement upon patients comfort and satisfaction will go a long way. Hence we aimed to study the sedation practices in procedures under SA. This study may help in devising an ideal sedation protocol to be followed in cases of SA which has been our primary focus.

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which may help in improving the quality of anesthesia by improving the level of patient satisfaction. Hence we started the study with objective to observe the various sedation protocols practiced in our institute during spinal anesthesia with regard to drugs used and their dosages, sedation levels, effect on the duration of SA and also to assess the level of patient satisfaction.

**MATERIAL AND METHODS**

This was an observational prospective study initiated after obtaining approval from the Institutional Ethics and Research Committee (Vide no. ECARP/2016/96) and written informed valid consent from all the patients conducted in a tertiary care teaching public hospital. The study spanned over a period of 12 months from December 2016 to December 2017. Study group comprised of patients undergoing elective infraumbilical surgeries of duration up to 90 minutes (general surgical, urological, gynaecologic and orthopaedic) under SA. We included 18 – 60 years both sexes and American Society of Anesthesiologists (ASA) I-II patients. Pregnant women, patients on sedatives, opioids, antidepressants, patients with anticipated difficult airway (Mallampatti Class III, IV) and patients given combined spinal epidural anaesthesia or any additives in the SA were excluded.

Being observational study patients received standard routine management for SA using 0.5% hyperbaric Bupivacaine as per the attending anaesthesiologist’s discretion and sedation was administered once adequate spinal level was achieved and the patient was hemodynamically stable. Following parameters were noted: Age, sex, Surgical procedure, ASA grade, Duration of surgery, Highest sensory level achieved, Sedation drug used, Ramsay Sedation Score (RSS as mentioned in Table 1) was noted after sedation and post-operatively, Time for two-dermatomal regression, Time for rescue analgesia. Heart rate (HR), blood pressure (BP), \( \text{SpO}_2 \), respiratory rate was noted every 5 minutes for the first 30 minutes, followed by every 10 minutes intra-operatively and post-operatively every 30 minutes for 2 hours and complications if any were noted. At the end of the procedure, patients were asked to assess their level of satisfaction on a scale of 1-10 where 1- completely dissatisfied, and 10-completely satisfied and Patient satisfaction score was noted.

**STATISTICAL ANALYSIS**

Study population was selected by non-probability convenience sampling method. During the study period all the patients fulfilling inclusion criteria (500 patients) were included in the study. Data was summarized in MS Excel. Quantitative data (Age, RSS, patient satisfaction score etc) was presented with the help of Mean, Standard deviation (SD), Median and Interquartile range (IQR). Qualitative data (sex, ASA grade, sedation drug etc) was presented with the help of frequency and percentage table. Epi Info 7.2 software was used for statistical analysis. Chi square test and unpaired t test were applied wherever required and 95% confidence interval was taken and p value less than 0.05 were considered as tests of significance. However, given that matching of study groups had not been done; this significance has its limitations.

**RESULTS**

<table>
<thead>
<tr>
<th>Sedation score (RSS)</th>
<th>Clinical response</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Paralyzed, unable to evaluate</td>
</tr>
<tr>
<td>1</td>
<td>Awake</td>
</tr>
<tr>
<td>2</td>
<td>Lightly sedated</td>
</tr>
<tr>
<td>3</td>
<td>Moderately sedated, follows simple commands</td>
</tr>
<tr>
<td>4</td>
<td>Deeply sedated, responds to non-painful stimulus</td>
</tr>
<tr>
<td>5</td>
<td>Deeply sedated, responds only to painful stimulus</td>
</tr>
<tr>
<td>6</td>
<td>Deeply sedated, unresponsive to painful stimulus</td>
</tr>
</tbody>
</table>

**Table-1: Modified Ramsay Sedation Scale**

**Figure-1:** Distribution of patients according to drug and RSS (2, 3) after sedation

**Figure-2:** Distribution of patients according to drug and RSS (1, 2, 3) in the postoperative period.

**Figure-3:** Comparison of intraoperative Heart rate among sedative drugs
Total 500 patients were studied, out of them 185 (37%) were males and 315 (63%) were females. Dexmedetomidine was administered in 189 patients (37.8%), including 78 males (15.6%) and 111 females (22.2%). 301 patients (60.2%) were given Midazolam, including 104 males (20.8%) and 197 females (39.4%). Propofol was given to 10 patients (2%), consisting of 3 males (0.6%) and 7 females (1.4%). The mean age of patients receiving Dexmedetomidine was 39.15 years (+/- 9.93), Midazolam was 39.21 (+/- 12.46), and Propofol was 26.30 years (+/- 9.93). Drugs used for sedation were in standard dosages as Midazolam (1 mg IV bolus), Dexmedetomidine (0.5 μg/kg over 20 minutes followed by 0.5 μg/kg/hr infusion) or Propofol (50 μg/kg/min infusion which is equivalent to 3 mg/kg/hr). Mean duration of surgery in all the groups were comparable from 55-65 min.

Mean time required for regression of two-dermatomal sensory levels, Mean time for rescue analgesia requirement, RSS after sedation and postoperative RSS and Patient satisfaction score among all the drugs used for sedation in this study. The comparison of mean time for rescue analgesia was prolonged in dexmeditomidine. In the current study the mean time required for regression of two-dermatomal sensory levels was prolonged in Dexmedetomidine (121.64 mins), as compared to Midazolam (101.98 mins) and Propofol (103 mins). Dinesh CN et al observed similar finding in dexmedetomidine. In the current study we observed that Midazolam followed by Dexmedetomidine were preferred drugs for sedation in SA. When attending anaesthesiologist’s were asked about choice of particular drug for sedation in SA, they mentioned type and duration of surgery, hemodynamic parameters, preoperative anxiety level and availability of drugs as deciding factors. The demographic parameters of the patients and average duration of surgery were comparable among all the drugs used for sedation in this study.

In the current study the mean time required for regression of two-dermatomal sensory levels was prolonged in Dexmedetomidine (121.64 mins), as compared to Midazolam (101.98 mins) and Propofol (103 mins). Dinesh CN et al (137.4 min), Harsoor et al, Lee et al observed similar finding in dexmedetomidine. Kaya et al concluded that IV Dexmedetomidine and not Midazolam prolongs the duration of SA and Talakoub et al found no effect of Midazolam on duration of sensory block.

Our study also showed that duration of analgesia was...
Among complications many authors mentioned a higher incidence of bradycardia in Dexmedetomidine sedation and incidence of hypotension in Propofol and Midazolam. Patki et al also showed the absence of clinically relevant bradycardia and hypotension. Thus, sedation was associated with good patient satisfaction and stable hemodynamics and also prolonged post-operative analgesia. A study by Attri JP et al mention that use of sedation in RA has increased patient’s acceptance and satisfaction. Also improved sedation delivery devices and monitoring of sedation depth has increased accuracy without compromising the safety.

The study was not without limitations as this was an observational prospective study. Proper randomization and matching was not carried out, limiting the utility of comparison between drugs. Hence to generalize the results and improve validity, a multicentric randomized controlled study would be conducted.

CONCLUSION

To conclude, drugs used for sedation in 500 patients in our study during procedures under SA were IV Dexmedetomidine (189), Midazolam (301) and Propofol (10). Dexmedetomidine provided adequate sedation intra-operatively with good patient satisfaction, increased durations of sensory anaesthesia and post-operative analgesia leading to decreased rescue analgesia requirement and minimal occurrence of bradycardia which was easily treatable. Midazolam and Propofol were found to be excellent alternatives for sedation during SA however having limited role in prolonging SA and prolonging the requirement of rescue analgesia. They were also associated with good patient satisfaction. Sedating the patient under SA was found to have significant advantages of allaying the anxiety of the patient, inducing sedation as well as amnesia without compromising safety. Patients are often unwilling to be aware during a procedure under SA. Sedation improved patient satisfaction and the patient's acceptance of SA and improvement in the quality of SA. All the three drugs in this study provided optimum sedation without respiratory depression with stable hemodynamics and good patient satisfaction. In addition, Dexmedetomidine increased durations of sensory anaesthesia and post-operative analgesia compared to Midazolam and Propofol.

REFERENCES

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