

Assessment of Complications and Hemodynaamic Stability with the Use of Dexmedetomidine with Bupivacaine

Vijay Pratap Yadav¹, Hari Kesh Yadav^{2*}

¹Assistant Professor, Department of Anaesthesia,

²Assistant Professor, Department of General Surgery,

Government Medical College and Super Facility Hospital, Azamgarh, Uttar Pradesh, India.

ABSTRACT

Background: Spinal block is the most commonly performed method for surgical treatments. Sensory block till the level of T10 is considered promising to remove the unease formed by bladder distension. The aim of the present study was to evaluate the complications and hemodynamic stability with the usage of dexmedetomidine with bupivacaine.

Materials and Methods: Patients with surgeries of spine, back infections, neurological problems or hepatic disorders were not included in the study. On reaching the Operating Theatre the monitors were integrated for observing non-invasive blood pressure, oxygen saturation and electrocardiography. The baseline recordings of BP, heart rate and partial pressure of oxygen were noted. Spinal puncture was achieved at level of L3 –L4 or L4 –L5 with 25-gauge needle at the sitting posture. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

Results: The mean age of the subjects was 38.25+/-4.77 years. Table 1 illustrates the hemodynamic parameters amongst both the groups. The preoperative pulse in Group I was 82.34+/- 3.54 and in group II was 83.90+/-2.65. There was 1 subject each in Group I and II with nausea. There was 1 subject in group II with hypotension.

Conclusion: The study elaborated no major changes in the hemodynamic constancy and the adverse effects between patients who were given bupivacaine alone or bupivacaine and dexmedetomidine.

Keywords: Adrenoreceptor, Bupivacaine, Dexmedetomidine, Hemodynamic.


*Correspondence to:

Dr. Hari Kesh Yadav,
Assistant Professor,
Department of General Surgery,
Government Medical College and Super Facility Hospital,
Azamgarh, Uttar Pradesh, India.

Article History:

Received: 30-07-2019, Revised: 27-08-2019, Accepted: 21-09-2019

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2019.5.5.045	

INTRODUCTION

Spinal block is the most commonly performed method for surgical treatments. Sensory block till the level of T10 is considered promising to remove the unease formed by bladder distension. Sensory block lower to this level covers the capsular signs associated with perforation of the bladder and may limit its quick diagnosis and treatment. Furthermore, because of the limited cardiovascular and respiratory outcomes amongst the elderly patients undergoing TURP, it is important to delay the cephalad delay to diminish hemodynamic alteration.¹

Lesser levels of local anesthetic in addition with extracts delivers the necessary sensory level with sufficient analgesia.² Dexmedetomidine is S enantiomer of medetomidine that has a high degree of specificity for the adrenoreceptor.³ Till date, very few researches have been conducted on the action of intrathecal dexmedetomidine on spinal block with bupivacaine for urological procedures.⁴

The aim of the present study was to evaluate the complications and hemodynamic stability with the usage of dexmedetomidine with bupivacaine.

MATERIALS AND METHODS

The present prospective study was performed in the anesthesia department for a period of 1 year after the clearance from the institutional ethical board. All the patients were informed regarding the study and a written informed consent was obtained from in their vernacular language.

Patients with surgeries of spine, back infections, neurological problems or hepatic disorders were not included in the study. Total 20 patients were enrolled in the study having ASA grade I or ASA grade II category. With random sampling method patients were categorized - Group I receiving 12.5mg of 0.5% hyperbaric bupivacaine hydrochloride and Group II receiving 3 µg of

dexmedetomidine hydrochloride in combination with same dose of hyperbaric bupivacaine hydrochloride. No anesthesiologist belonging in the present study was aware about the group assigned until the entire 20 subjects were engaged and the study was accomplished. All the patients were told not to take food after midnight before beginning of surgery and took clear liquids only till 2 hours before surgery beginning. On reaching the Operating Theatre the monitors were integrated for observing non-invasive blood pressure, oxygen saturation and electrocardiography. The baseline recordings of BP, heart rate and partial pressure of oxygen were noted. Spinal puncture was achieved at spine level of L3 –L4 or L4 –L5 with 25-gauge needle at the sitting posture. After verification of a clear and free flow of CSF, the drug was

administered and the patients were kept at the supine posture. For every subject, heart rate and mean arterial pressure were monitored till every 2 min for the first 10 minutes after spinal anesthesia, then after 5 minutes until 30 minutes and then after every 30 minutes until complete motor and sensory recoveries were achieved. Patients were regarded to have bradycardia if HR was below 40 and hypotension was regarded when mean arterial pressure was less than 50. Adverse events like bradycardia, nausea, hypotension, shivering, vomiting and pruritus were recorded during the surgery.

All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software. Probability value of less than 0.05 was regarded as significant.

Table 1: Comparison of hemodynamic parameters amongst the groups

Variable	Group I	Group II	P value
Preoperative vitals			>0.05
Pulse	82.34+/- 3.54	83.90+/-2.65	
BP	93.57+/-8.22	92.42+/-5.38	
Intraoperative vitals			>0.05
Pulse	82.21+/-2.11	81.88+/-5.34	
BP	87.45+/-1.37	89.76+/-4.66	
Postoperative vitals			>0.05
Pulse	83.38+/-1.35	79.29+/-3.15	
BP	89.22+/-2.27	91.33+/-5.75	

Table 2: Intraoperative complications encountered during the study

Complications	Group I	Group II	P value
Nausea	1	1	>0.05
Hypotension	0	1	>0.05
Bradycardia	2	1	>0.05
Vomiting	0	1	>0.05
Respiratory depression	0	0	>0.05
Pruritis	0	0	>0.05
Shivering	1	0	>0.05

RESULTS

The present study enrolled 20 subjects with 10 patients in each group. The mean age of the subjects was 38.25+/-4.77 years. Table 1 illustrates the hemodynamic parameters amongst both the groups. The preoperative pulse in Group I was 82.34+/- 3.54 and in group II was 83.90+/-2.65. There was no significant difference between them. The preoperative BP in Group I was 93.57+/-8.22 and in group II was 92.42+/-5.38. There was no significant difference between them. The intraoperative pulse in Group I was 82.21+/-2.11 and in group II was 81.88+/-5.34. There was no significant difference between them. The intraoperative BP in Group I was 87.45+/-1.37 and in group II was 89.76+/-4.66. There was no significant difference between them. The postoperative pulse in Group I was 83.38+/-1.35 and in group II was 79.29+/-3.15. There was no significant difference between them. The postoperative pulse in Group I was 89.22+/-2.27 and in group II was 91.33+/-5.75. There was no significant difference between them.

Table 2 shows the intraoperative complications encountered in the study. There was 1 subject each in Group I and II with nausea. There was 1 subject in group II with hypotension. There was 1 subject in Group II with vomiting. There was 1 subject in Group I and no in Group II with shivering. There was no subject with respiratory depression in both groups. There was no significant difference between the groups.

DISCUSSION

Spinal block has the propensity of being a harmless anesthetic technique till the time physiological outcomes are within normal limits after that, complications of the anesthetic starts elaborating. The side effects of spinal blockage, majorly, hypotension, reduced heart rate, headache, vomiting, emesis and infrequent neurological alterations have impacted its reputation. Despite of the wavering popularity, spinal block is one of the elementary techniques in the area of modern anesthesiologists.

The implication for its transformed popularity in the present era is due to realization that spinal anesthesia can relate to a low level of physiological bypass on one side and deep degree of denervation and relaxation of the musculature on the opposite side.⁵ The use of spinal block has its drawbacks for treatments of long duration because of short duration of action. So, it became obligatory to see for techniques that increase the duration of blockade. Various drugs like morphine, pethidine, neostigmine, and alpha 2 agonists are tested intrathecally for this usage.⁶ The present study enrolled 20 subjects with 10 patients in each group. The mean age of the subjects was 38.25±/4.77 years. Table 1 illustrates the hemodynamic parameters amongst both the groups. The preoperative pulse in Group I was 82.34±/ 3.54 and in group II was 83.90±/2.65. There was no significant difference between them. The preoperative BP in Group I was 93.57±/8.22 and in group II was 92.42±/5.38. There was no significant difference between them. The intraoperative pulse in Group I was 82.21±/2.11 and in group II was 81.88±/5.34. There was no significant difference between them. The intraoperative BP in Group I was 87.45±/1.37 and in group II was 89.76±/4.66. There was no significant difference between them. The postoperative pulse in Group I was 83.38±/1.35 and in group II was 79.29±/3.15. There was no significant difference between them. The postoperative pulse in Group I was 89.22±/2.27 and in group II was 91.33±/5.75. There was no significant difference between them. There was 1 subject each in Group I and II with nausea. There was 1 subject in group II with hypotension. There was 1 subject in Group II with vomiting. There was 1 subject in Group I and no in Group II with shivering. There was no subject with respiratory depression in both groups. There was no significant difference between the groups. Drugs like clonidine and opioids intrathecally added to improve the activity of local anesthetics have observed great popularity due to the belief that they provide longer duration of postoperative analgesia and enable decreased amount of local anesthetic, hence reducing the frequency of adverse actions. The discovery of receptors for opioid in spinal and supra spinal areas directed the use of spinal opioids.⁷ Opioids have intense, long term analgesic actions without any autonomic changes, loss of motor action or impairment in sensory activity additional to pain when given intrathecally or epidurally.⁸ Studies that regarded 10–15 mg as the general dose of bupivacaine, did not see any major changes in peak sensory block between bupivacaine and bupivacaine with dexmedetomidine.^{9,10} Intrathecal delivery of α2-agonists leads to a dose-dependent sedation in humans.¹¹ Since then, there have been few studies in human on the usage of intrathecal dexmedetomidine.^{12,13}

CONCLUSION

The study elaborated no major changes in the hemodynamic constancy and the adverse effects between patients who were given bupivacaine alone or bupivacaine and dexmedetomidine. Though adding dexmedetomidine lead to a better sensory and motor block and analgesia.

REFERENCES

1. Kararmaz A, Kaya S, Turhanoglu S, Ozyilmaz MA. Low-dose bupivacaine-fentanyl spinal anaesthesia for transurethral prostatectomy. *Anaesthesia* 2003;58:526-30.

2. Healy TE, Knight PR. *Wylie Churchill-Davidson's a Practice of Anesthesia*. 7 th ed. USA: CRC Press; 2003. p. 929-40.
3. Joseph A. Giovanni, Jr, Sean M. Thoms, James J. Crawford. Alpha-2 Adrenergic Receptor Agonists: A Review of Current Clinical Applications. *Anesth Prog* 2015; 62 (1): 31–8.
4. Al-Mustafa MM, Abu-Halaweh SA, Aloweidi AS, Murshidi MM, Ammari BA, Awwad ZM, et al. Effect of dexmedetomidine added to spinal bupivacaine for urological procedures. *Saudi Med J* 2009;30:365-70.
5. Koller K. On the use of cocaine for producing anaesthesia on the eye. *Lancet* 1884;2:990-4.
6. Eti Z, Umuroğlu T, Takil A, Göğüş Y. The comparison of the effects and side effects of local anesthetic and opioid combinations in epidural patient controlled analgesia. *Agri* 2005;17:34-9.
7. Perioperative sympatholysis. Beneficial effects of the alpha2-adrenoceptor agonist mivazerol on hemodynamic stability and myocardial ischemia. *McSPI – Europe research group. Anesthesiology* 1997;86:346-63.
8. Vieira AM, Schnaider TB, Brandao AC, Pereira FA, Costa ED, Fonseca CE. Epidural clonidine or dexmedetomidine for postcholecystectomy analgesia and sedation. *Rev Bras Anesthesiol* 2004;54:473-8.
9. Gupta R, Verma R, Bogra J, Kohli M, Raman R, Kushwaha JK, et al. A comparative study of intrathecal dexmedetomidine and fentanyl as adjuvants to bupivacaine. *J Anaesthesiol Clin Pharmacol* 2011;27:339-43.
10. Hala EE, Mohamed SA, Hend Y. Dose-related prolongation of hyperbaric bupivacaine spinal anesthesia by dexmedetomidine. *Ain Shams J Anesthesiol* 2011;4:83-95.
11. De Kock M, Gautier P, Fanard L, Hody JL, Lavand'homme P. Intrathecal ropivacaine and clonidine for ambulatory knee arthroscopy: A dose-response study. *Anesthesiology* 2001;94:574-8.
12. Gupta R, Bogra J, Verma R, Kohli M, Kushwaha JK, Kumar S, et al. Dexmedetomidine as an intrathecal adjuvant for postoperative analgesia. *Indian J Anaesth* 2011;55:347-51.
13. Shukla D, Verma A, Agarwal A, Pandey HD, Tyagi C. Comparative study of intrathecal dexmedetomidine with intrathecal magnesium sulfate used as adjuvants to bupivacaine. *J Anaesthesiol Clin Pharmacol* 2011;27:495-9.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Vijay Pratap Yadav, Hari Kesh Yadav. Assessment of Complications and Hemodynaamic Stability with the Use of Dexmedetomidine with Bupivacaine. *Int J Med Res Prof.* 2019 Sept; 5(5):203-05. DOI:10.21276/ijmrp.2019.5.5.045