ORIGINAL RESEARCH

The role of intrathecal dexmedetomidine with bupivacaine spinal anaesthesia in patients undergoing TURP

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Received: 18 June, 2019 Accepted: 23 July, 2019

ABSTRACT
Background: Males who have benign prostatic hyperplasia (BPH), a common chronic condition that progresses slowly, have an enlarged prostate gland and a blocked bladder outlet. The present study was conducted to compare intrathecal dexmedetomidine with low-dose bupivacaine spinal anaesthesia and a higher dose of bupivacaine in patients undergoing TURP. **Materials & Methods:** 80 adult males aged 40- 70 years with benign prostate hyperplasia undergoing TURPwere divided into 2 groups of 40 each. In group I, patients received 7.5 mg of 0.5% hyperbaric bupivacaine hydrochloride and group II patients received 3 µg of dexmedetomidine hydrochloride combined with 6 mg of 0.5% hyperbaric bupivacaine hydrochloride. Regression time from peak sensory block level, VAS (hours), the Modified Bromage score at the conclusion of operation, the need for analgesics during and after surgery, and adverse effects were among the parameters that were noted. **Results:** The time to reach T10 sensory block was 12.1 in group I and 10.4 in group II. VAS score at 1 hour was 2.7 and 1.3, 2 hours was 3.4 and 2.9, 3 hours was 2.7 and 1.8 and 4 hours was 1.2 and 1.9. Modified Bromage score at the end of surgery 1 was seen in 1 in group I, 2 in 5 in group I and 15 in group II, 3 seen 342 in group I and 25 in group II. The difference was significant (P< 0.05). Side effects were vomiting 5 in group I and 8 in group II, nausea seen in 3 in group I and 1 in group II, pruritus 2 in group I and 4 in group II and hypotension 1 in group I and 2 in group II. The difference was non- significant (P> 0.05). **Conclusion:** Longer perioperative analgesia duration, a quicker onset of sensory and motor block, and both were observed when 3 µg of dexmedetomidine was given to 6 mg of bupivacaine.

Key words*:* Benign prostatic hyperplasia, sensory, motor

INTRODUCTION
Males who have benign prostatic hyperplasia (BPH), a common chronic condition that progresses slowly, have an enlarged prostate gland and a blocked bladder outlet.[1] Transurethral resection of the prostate, or TURP, is the term for endoscopic prostate resection. It was the first major minimally invasive operation of its kind in contemporary times.[2] This treatment has been used for many years and is still considered the gold standard for bladder outlet obstruction (BOO) surgery, with just minor changes since its modern inception in 1943.[3] In certain instances of obstructive azoospermia, a TURP can also be performed to open the ejaculatory channels and unroof prostatic abscesses.[4]

Spinal anesthesia is the most often used approach for transurethral prostate resection (TURP). The pain associated with bladder distension is believed to be alleviated by sensory blocking up to T10.4.[5] For α2-adrenoreceptors, dexmedetomidine, the S-enantiomer of medetomidine, exhibits a high degree of selectivity. Additionally, it has been noted that lesser doses of local anesthetic mixed with additives produce the required sensory level with appropriate analgesia.[6]The present study was conducted to compare intrathecal dexmedetomidine with low-dose bupivacaine spinal anaesthesia and a higher dose of bupivacaine in patients undergoing TURP.

MATERIALS & METHODS
The present study consisted of 80 adult males aged 40- 70 years with benign prostate hyperplasia undergoing TURP. All agreed for participation in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 40 each. In group I, patients received 7.5 mg of 0.5% hyperbaric bupivacaine hydrochloride and group II patients received 3 µg of dexmedetomidine hydrochloride combined with 6 mg of 0.5% hyperbaric bupivacaine hydrochloride. Regression time from peak sensory block level, VAS (hours), the Modified Bromage score at the conclusion of operation, the need for analgesics during and after surgery, and adverse effects were among the parameters that were noted. The results were statistically analysed. test. P value less than 0.05 was set significant.

RESULTS

Table I Comparison of parameters

Parameters	Variables	Group I	Group II	P value
Time to reach T10 sensory block (min)		12.1	10.4	0.05
VAS (Hours)	1	2.7	1.3	0.01
	2	3.4	2.9	0.01
	3	2.7	1.8	0.04
	4	1.2	1.9	0.24
Modified Bromage score at the end of surgery	0	0	0	0
	1	1	0	0.73
	2	5	15	0.01
	3	34	25	0.05

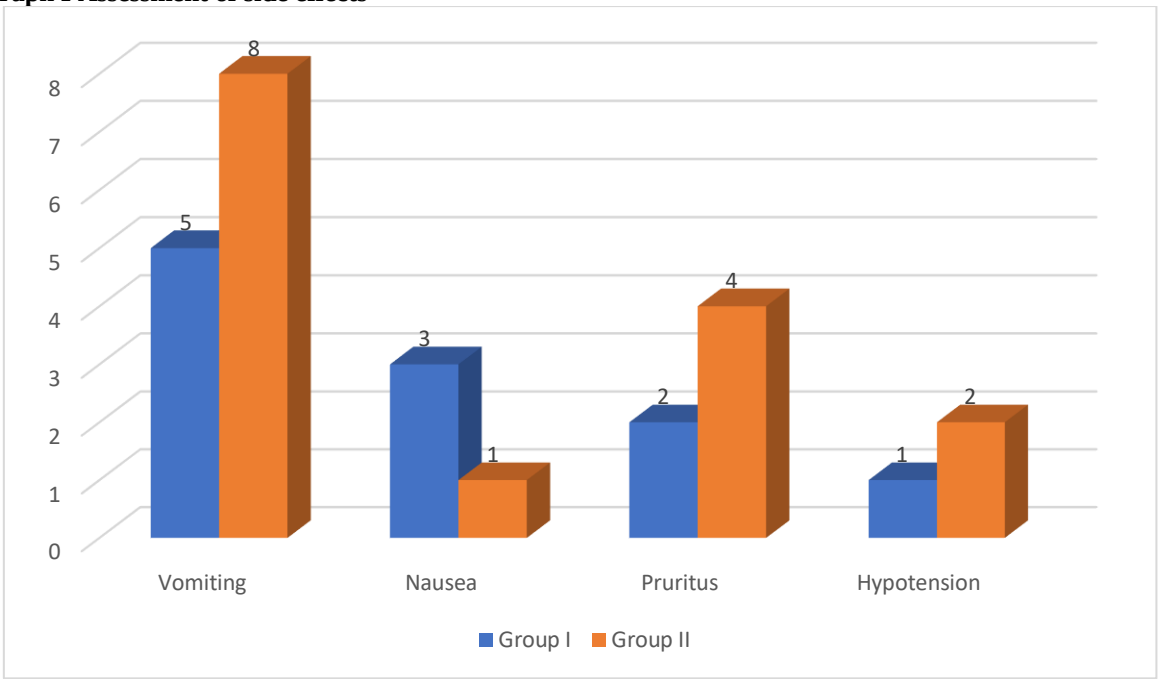
Table I shows that the time to reach T10 sensory block was 12.1 in group I and 10.4 in group II. VAS score at 1 hour was 2.7 and 1.3, 2 hours was 3.4 and 2.9, 3 hours was 2.7 and 1.8 and 4 hours was 1.2 and 1.9. Modified Bromage score at the end of surgery1 was seen in 1 in group I, 2 in 5 in group I and 15 in group II, 3 seen 342 in group I and 25 in group II. The difference was significant (P< 0.05).

Table II Assessment of side effects

Side effects	Group I	Group II	P value
Vomiting	5	8	0.57
Nausea	3	1	
Pruritus	2	4	
Hypotension	1	2	

Table II, graph I show thatside effects were vomiting5 in group I and 8 in group II, nausea seen in 3 in group I and 1 in group II, pruritus2 in group I and 4 in group II and hypotension 1 in group I and 2 in group II. The difference was non- significant (P> 0.05).

Graph I Assessment of side effects



DISCUSSION

In older men, a common chronic illness called benign prostatic hyperplasia (BPH) causes the prostate gland to grow and obstructs the bladder outflow.[7] As the population ages and life expectancies increase, more people are receiving a diagnosis of major BPH.[8] In the treatment of BPH, transurethral resection of the prostate (TURP) has long been regarded as the "gold standard." TURP is still subject to prostatic volume, hemorrhage, transurethral resection syndrome (TURS), and other restrictions.[9,10] A new method for treating large BPH was just introduced: transurethral bipolar plasmakinetic enucleation of the prostate (PKEP). PKEP was created based on suprapubic prostatectomy and TURP in order to solve the shortcomings of TURP.[11]The present study compared intrathecal dexmedetomidine with low-dose bupivacaine spinal anaesthesia and a higher dose of bupivacaine in patients undergoing TURP.

We found that the time to reach T10 sensory block was 12.1 in group I and 10.4 in group II. VAS score at 1 hour was 2.7 and 1.3, 2 hours was 3.4 and 2.9, 3 hours was 2.7 and 1.8 and 4 hours was 1.2 and 1.9. Modified Bromage score at the end of surgery 1 was seen in 1 in group I, 2 in 5 in group I and 15 in group II, 3 seen 342 in group I and 25 in group II. Kim et al[12]evaluated the adjuvant effects of intrathecal dexmedetomidine in elderly patients undergoing transurethral prostate surgery with low-dose bupivacaine spinal anesthesia. Fifty-four patients undergoing transurethral prostate surgery were randomized into two groups receiving either dexmedetomidine 3 μg (n=27) or normal saline (n=27) intrathecally with 6 mg of 0.5% hyperbaric bupivacaine. The characteristics of the spinal block and postoperative analgesic effects were evaluated. The peak block level was similar for the two groups. However, the dexmedetomidine group demonstrated a faster onset time to the peak block and longer duration of spinal block than the saline group ($p<0.01$). The motor block scales at the time of peak sensory block and regression of 2-sensory dermatomes were higher in the dexmedetomidine group than in the saline group ($p<0.001$). There was less analgesic request and the time to the first analgesic request was longer in the dexmedetomidine group than in the saline group (each 487, 345 min, $p<0.05$). Dexmedetomidine 3 μg when added to intrathecal bupivacaine 6 mg produced fast onset and a prolonged duration of sensory block and postoperative analgesia in elderly patients for transurethral surgery.

We observed that side effects were vomiting 5 in group I and 8 in group II, nausea seen in 3 in group I and 1 in group II, pruritus 2 in group I and 4 in group II and hypotension 1 in group I and 2 in group II.TURP appointments were made for sixty participants in the study by Chattopadhyay et al.[13] They were split into two groups: Group I had solely hyperbaric bupivacaine administered intrathecally, while Group II received modest doses of bupivacaine in addition to dexmedetomidine. The time it took for two dermatomes to retreat from the highest sensory block level was the primary finding of the study. The baseline and demographic features of both groups were similar, as were their peak sensory block levels (T9). As seen by their quicker time to reach T10 (10.72 ± 3.50 vs. 12.72 ± 3.90 min, $P = 0.041$), the patients in Group II had a speedier onset. Furthermore, their time to initial analgesic demand (300 ± 25.30 vs. 220 ± 15.12 min, $P = 0.0001$) and motor block duration (200 ± 18.23 vs. 190 ± 10.15 min, $P = 0.011$) werelonger.

CONCLUSION

Authors found that longer perioperative analgesia duration, a quicker onset of sensory and motor block, and both were observed when 3 μg of dexmedetomidine was given to 6 mg of bupivacaine.

REFERENCES

1. Pitkanen M. Spinal (subarachnoid) blockade. Neural blockade in clinical anesthesia and pain medicine. In: Cousins MJ, Carr DB, Horlocker TT, Bridenbaugh PO, editors. Wolters Kluwer Health. Vol. 4. Philadelphia: Lippincott Williams & Wilkins; 2009. p. 221.
2. Akcaboy EY, Akcaboy ZN, Gogus N. Low dose levobupivacaine 0.5% with fentanyl in spinal anaesthesia for transurethral resection of prostate surgery. J Res Med Sci 2011;16:68-73.
3. Erdil F, Bulut S, Demirbilek S, Gedik E, Gulhas N, Ersoy MO, et al. The effects of intrathecal levobupivacaine and bupivacaine in the elderly. Anaesthesia 2009;64:942-6.
4. Elia N, Culebras X, Mazza C, Schiffer E, Tramèr MR. Clonidine as an adjuvant to intrathecal local anesthetics for surgery: Systematic review of randomized trials. Reg Anesth Pain Med 2008;33:159-67.
5. Joseph A. Giovannitti, 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.
6. 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.
7. Kanazi GE, Aouad MT, Jabbour-Khoury SI, Al Jazzar MD, Alameddine MM, Al-Yaman R, et al. Effect of low-dose dexmedetomidine or clonidine on the characteristics of bupivacaine spinal block. Acta Anaesthesiol Scand 2006;50:222-7.
8. Hong JY, Yang SC, Ahn S, Kil HK. Preoperative comorbidities and relationship of comorbidities with postoperative complications in patients undergoing transurethral prostate resection. J Urol2011;185:1374-8.
9. Ruppen W, Steiner LA, Drewe J, Hauenstein L, Brugger S, Seeberger MD, et al. Bupivacaine concentrations in the lumbar cerebrospinal fluid of patients during spinal anaesthesia. Br J Anaesth2009;102:832-8.
10. Veering BT, Immink-Speet TT, Burm AG, Stienstra R, van Kleef JW. Spinal anaesthesia with 0.5% hyperbaric bupivacaine in elderly patients: Effects of duration spent in the sitting position. Br J Anaesth2001;87:738-42.

11. Carnevale FC, Iscaife A, Yoshinaga EM, Moreira AM, Antunes AA, Srougi M. Transurethral resection of the prostate (TURP) versus original and PErFecTED prostate artery embolization (PAE) due to benign prostatic hyperplasia (BPH): preliminary results of a single center, prospective, urodynamic-controlled analysis. Cardiovascular and interventional radiology. 2016 Jan;39(1):44-52.
12. Kim JE, Kim NY, Lee HS, Kil HK. Effects of intrathecal dexmedetomidine on low-dose bupivacaine spinal anesthesia in elderly patients undergoing transurethral prostatectomy. Biological and Pharmaceutical Bulletin. 2013 Jun 1;36(6):959-65.
13. Chattopadhyay I, Banerjee SS, Jha AK, Basu S. Effects of intrathecal dexmedetomidine as an additive to low-dose bupivacaine in patients undergoing transurethral resection of prostate. Indian J Anaesth2017;61:1002-8.