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ORIGINAL RESEARCH

Transurethral resection of the prostate using intrathecal dexmedetomidine with variables doses of bupivacaine

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ABSTRACT:
Background: Benign prostatic hyperplasia (BPH) is the most frequent cause of lower urinary tract symptoms (LUTS) in the aging male. The present study compared intrathecal dexmedetomidine with low-dose bupivacaine spinal anaesthesia versus a higher dose of bupivacaine in patients undergoing transurethral resection of the prostate (TURP).
Materials & Methods: 60 male patients undergoing transurethral resection of the prostatewere divided into 2 groups of 30 each. Group I received 7.5 mg of 0.5% hyperbaric bupivacaine hydrochloride and group II received 3 µg of dexmedetomidine hydrochloride along with 6 mg of 0.5% hyperbaric bupivacaine hydrochloride. Parameters such as regression time from peak sensory block level, assessment of the motor block scales, haemodynamic alterations were recorded.
Results: Time to reach T10 sensory block was 12.6 minutes in group I and 10.2 minutes in group II. Modified Bromage score at the end of surgery 1 was seen in 7 in group I, 2 in 8 in group I and 17 in group II, 3 seen 15 in group I and 13 in group II. VAS score at 1 hours was 3.4 and 2.6, at 2 hours was 2.1 and 2.0, at 3 hours was 1.9 and 1.5 and at 4 hours was 1.1 and 1.3. The difference was significant (P< 0.05). Common side effects werenausea seen in 4 in group I and 3 in group II, vomiting 3 in group I and 2 in group II, pruritis 3 in group I and 1 in group II and hypotension 1 in group I and 2 in group II.
Conclusion: Authors found that addition of 3 µg of dexmedetomidine added to 6 mg bupivacaine resulted prolonged perioperative analgesia and a faster onset and longer duration of sensory and motor block.
Key words: Benign prostatic hyperplasia, bupivacaine, Transurethral resection of the prostate

INTRODUCTION

Benign prostatic hyperplasia (BPH) is the most frequent cause of lower urinary tract symptoms (LUTS) in the aging male.[1] Moderate to severe LUTS will occur in about one quarter of men in their 50 s, and in about half of all men aged 80 years or older.[2] Benign prostatic hyperplasia (BPH) is a common chronic progressive disease resulting in the enlargement of the prostate gland and bladder outlet obstruction in aging men. With the aging of society and extension of life expectancy, more and more patients are diagnosed with massive BPH.[3]

Transurethral resection of the prostate (TURP) has ever been known as the "gold standard" for BPH treatment. For more than 80 years, transurethral resection of the prostate (TURP) has been considered as the gold standard surgical treatment for BPH.Spinal anaesthesia is the most routinely used procedure for transurethral resection of prostate (TURP).[4] Sensory block up to T10 is considered favourable to abolish the discomfort caused by bladder distension. Sensory block cephalad to this hides the capsular signs associated with bladder perforation and may hamper its early diagnosis and treatment.[5] Moreover, because of the restricted cardiovascular and respiratory reserves in older patients undergoing TURP, it is important to limit the cephalad spread to lessen haemodynamic changes. Smaller doses of local anaesthetic in combination with additives provide the required sensory level with appropriate analgesia.[6] Dexmedetomidine is a potent and selective α2 -adrenoreceptor agonist. The antinociceptive properties of intrathecal α2 -adrenoreceptor agonists are manifested by suppressing the release of C-fibre transmitters, hyperpolarisation of post-synaptic dorsal horn neurons and inhibition of release of substance P.[7] The present study compared intrathecal dexmedetomidine with low-dose bupivacaine spinal anaesthesia versus a higher dose of bupivacaine in patients undergoing transurethral resection of the prostate (TURP).

MATERIALS & METHODS

The present study consisted of 60 male patients undergoing transurethral resection of the prostate. All gave their written consent for participation in the study.

Data such as name, age etc. was recorded. Patients were divided into 2 groups of 30 each. Group I received 7.5 mg of 0.5% hyperbaric bupivacaine hydrochloride and group II received 3 µg of dexmedetomidine hydrochloride along with 6 mg of 0.5% hyperbaric bupivacaine hydrochloride. Parameters such as regression time from peak sensory block level, assessment of the motor block scales, haemodynamic alterations as well as the intra- and post-operative analgesic requirements in both the groups were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Comparison of parameters

Parameters	Variables	Group I	Group II	P value
Time to reach T10 sensory block (min)		12.6	10.2	0.91
Modified Bromage score at the end of surgery	0	0	0	0.82
	1	7	0	
	2	8	17	
	3	15	13	
VAS (Hours)	1Hour	3.4	2.6	0.05
	2Hours	2.1	2.0	0.86
	3Hours	1.9	1.5	0.71
	4Hours	1.1	1.3	0.05

Table I, graph I shows that time to reach T10 sensory block was 12.6 minutes in group I and 10.2 minutes in group II. Modified Bromage score at the end of surgery 1 was seen in 7 in group I, 2 in 8 in group I and 17 in group II, 3 seen 15 in group I and 13 in group II. VAS score at 1 hours was 3.4 and 2.6, at 2 hours was 2.1 and 2.0, at 3 hours was 1.9 and 1.5 and at 4 hours was 1.1 and 1.3. The difference was significant ($P< 0.05$).

Graph I: Comparison of parameters

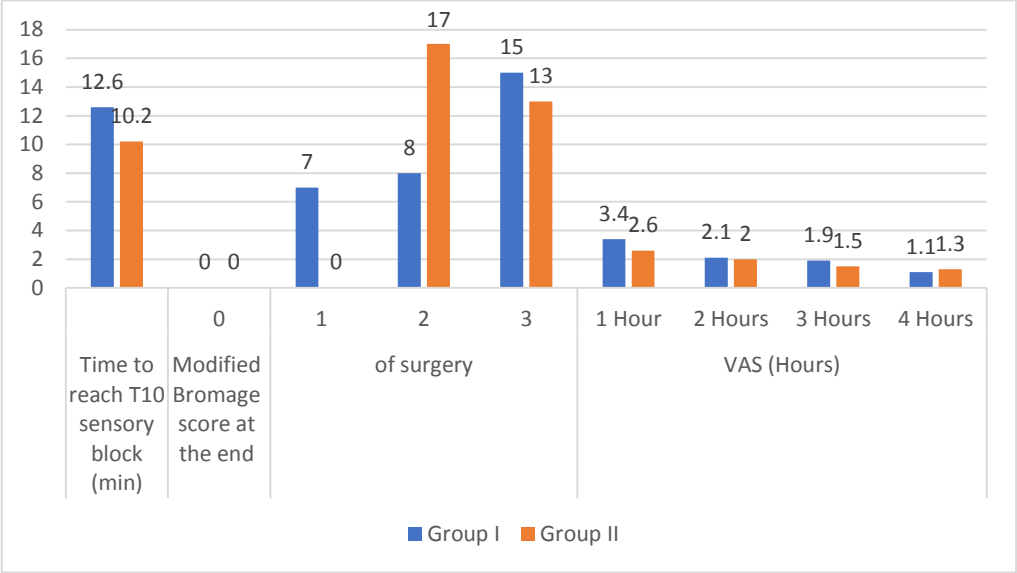
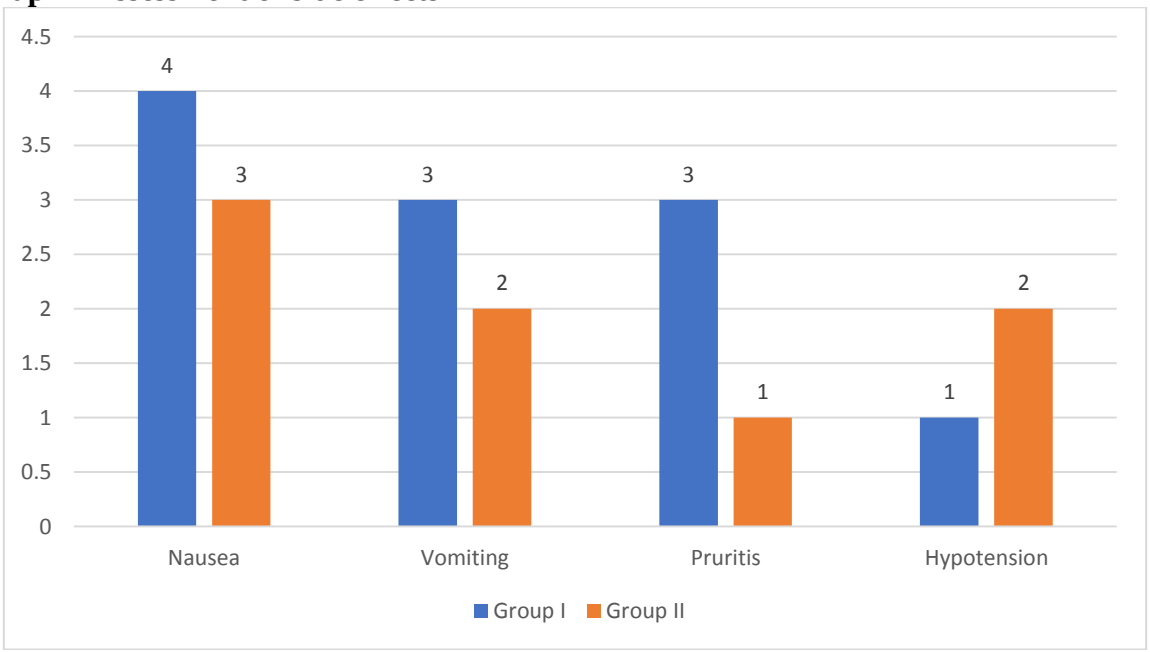


Table II Assessment of side effects

Side effects	Group I	Group II	P value
Nausea	4	3	0.42
Vomiting	3	2	
Pruritis	3	1	
Hypotension	1	2	

Table II shows that common side effects were nausea seen in 4 in group I and 3 in group II, vomiting 3 in group I and 2 in group II, pruritis 3 in group I and 1 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

TURP for benign prostatic hyperplasia is frequently performed in elderly patients having cardiovascular limitations with various systemic diseases. TURP still has certain restrictions such as bleeding, prostatic volume, transurethral resection syndrome (TURS), and so on.[8,9] Recently, transurethral bipolar plasmakinetic enucleation of the prostate (PKEP) has been introduced as the new method for massive BPH treatment. On the basis of TURP and suprapubic prostatectomy, PKEP was introduced to overcome the shortcomings of TURP.[10] Dexmedetomidine is the S-enantiomer of medetomidine with a high degree of specificity for α2-adrenoreceptor (α2:α1, 1620:1).In addition, the effectiveness of α2 -adrenoreceptor agonist has been shown to correspond well with their binding affinity to spinal α2 -adrenoreceptors.[11]The present study compared intrathecal dexmedetomidine with low-dose bupivacaine spinal anaesthesia versus a higher dose of bupivacaine in patients undergoing transurethral resection of the prostate (TURP).

We found that time to reach T10 sensory block was 12.6 minutes in group I and 10.2 minutes in group II. Modified Bromage score at the end of surgery 1 was seen in 7 in group I, 2 in 8 in group I and 17 in group II, 3 seen 15 in group I and 13 in group II. VAS score at 1 hours was 3.4 and 2.6, at 2 hours was 2.1 and 2.0, at 3 hours was 1.9 and 1.5 and at 4 hours was 1.1 and 1.3. Carnevale et al[12]compared clinical and urodynamic results of transurethral resection of the prostate (TURP) to original and PErFecTED prostate artery embolization (PAE) methods for benign prostatic hyperplasia in 30 patients. All groups were comparable for all pre-treatment parameters except bladder contractility and peak urine flow rate (Qmax), both of which were significantly better in the TURP group, and IIEF score, which was significantly higher among PErFecTED PAE patients than TURP patients. All groups experienced significant improvement in IPSS, QoL, prostate volume, and Qmax. TURP and PErFecTED PAE both resulted in significantly lower IPSS than oPAE but were not significantly different from one another. TURP resulted in significantly higher Qmax and significantly smaller prostate volume than either original or PErFecTED PAE but required spinal anesthesia and hospitalization. Two patients in the oPAE group with hypocontractile bladders experienced recurrence of symptoms and were treated with TURP. In the TURP group, urinary incontinence occurred in 4/15 patients (26.7 %), rupture of the prostatic capsule in 1/15 (6.7 %), retrograde ejaculation in all patients (100 %), and one patient was readmitted for temporary bladder irrigation due to hematuria.

We observed that common side effects werenausea seen in 4 in group I and 3 in group II, vomiting 3 in group I and 2 in group II, pruritis 3 in group I and 1 in group II and hypotension 1 in group I and 2 in group II.Chattopadhyay et al[13] conducted a study on sixty patients of American Society of Anesthesiologists Grade I–III scheduled for TURP. They were allocated into two groups: Group I receiving only hyperbaric bupivacaine intrathecally and Group II receiving dexmedetomidine with low dose bupivacaine. The time to regression of two dermatomes from the peak sensory block level was the primary outcome of the study. With comparable baseline and demographic attributes, both groups had similar peak sensory block levels (T9). Patients in Group II had quicker onset with the time to reach T10 being faster (10.72 ± 3.50 vs. 12.72 ± 3.90 min, P = 0.041), longer duration of motor block (200 ± 18.23 vs. 190 ± 10.15 min, P = 0.011) and increased time to first analgesic requirement (300 ± 25.30 vs. 220 ± 15.12 min, P = 0.0001).

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that addition of 3 µg of dexmedetomidine added to 6 mg bupivacaine resulted prolonged perioperative analgesia and a faster onset and longer duration of sensory and motor block.

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