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Original research article

COMPARISON OF ARTERIAL PRESSURE AND VASOPRESSOR (PHENYLEPHRINE) AMONG PATIENTS UNDERGOING TURP WITH SPINAL ANESTHESIA VERSUS SADDLE BLOCK

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Abstract: *Transurethral Resection of Prostate (TURP) is a common procedure for treating Benign Prostatic Hyperplasia (BPH) in elderly males. Spinal Anesthesia is conventionally used during the procedure; however, some studies have preferred saddle block regarding the average time of induction requirement for vasopressors. This study compared the mean change in mean arterial pressure and the mean vasopressor requirement (phenylephrine) among patients undergoing TURP with spinal anesthesia versus Saddle block. This randomized controlled trial was conducted at the Anesthesia Department, Jinnah Hospital Lahore, for Six months on 120 cases (group 1: 60, group 2: 60) of male patients aged 40-80 years undergoing TURP surgery. Patients in Group A received 2 ml of 0.75% bupivacaine and were placed supine with one pillow, while Group B received 2 ml of hyperbaric 0.75% in the same manner as Group A but remained in the sitting position for 10 minutes and then made supine with one pillow under the head. Demographic and clinical data was entered and analyzed using SPSS. Mean, Standard Deviation, Frequency, and percentages were calculated for quantitative and qualitative data, respectively, and an independent sample t-test was used for mean differences, keeping p-value<0.05 as significant. The mean age in the Spinal anesthesia group was 61.23 ± 12.06 years, while the mean age in the Saddle block group was 59.55 ± 11.57 years. In the Spinal and Saddle block, the mean arterial pressure before the procedure was 102.60 ± 5.33 and 95.52 ± 4.52, respectively. The mean change in MAP in the spinal group was 20.02 ± 5.76, and in the Saddle block group was 10.95 ± 5.93. The mean vasopressor requirement in Spinal anesthesia was 102.18 ± 19.17, and in Saddle block was 30.67 ± 26.46, respectively. All measures showed significantly lower mean change in Saddle block groups, p-value < 0.05 for all. This study's findings concluded that the mean change in mean arterial pressure and Vasopressor (phenylephrine) requirement among patients undergoing TURP Saddle block was favorable. So, TURP can be safely performed under saddle block without hypotension and less vasopressor requirement.*

Keywords: Transurethral Resection of Prostate (TURP), Benign Prostatic Hyperplasia (BPH), Spinal Anesthesia, Saddle block, Vasopressor, arterial pressure

Introduction

Benign Prostatic Hyperplasia (BPH) is a commonly occurring non-malignant growth in the prostate among aged men (Langan, 2019). Histologically, this problem is very much associated with age. It has a prevalence of 10% among men under 30, 20% in their 40s, 50-60% in their 60s, and 80-90% in men over 70 (Launer et al., 2021). Almost all men start developing some features of BPH as they age. However, not all of them will have any abnormal symptoms or may visit a doctor for this issue (Devlin et al., 2021). BPH becomes a clinical problem when the patient struggles with irritation, incontinence, and, most frequently, urinary tract infections. Because of this issue, treating BPH has been one of the major issues urologists have had to deal with over the past decade (Foo, 2019).

With the evolution of scientific research and health technology, several non-surgical treatments have been introduced to treat BPH and avoid the need for surgical intervention (Csikós et al., 2021). However, there are still many cases of having a large prostate and other clinical symptoms or complication, due to which surgical intervention become imperative (Picel et al., 2019). The surgical alternative that is also considered the gold standard is called Transurethral Resection of Prostate (TURP), which is routinely performed on patients with very large prostate. Physicians use various methods of anesthesia to prepare the students for surgery (Jiang and Qian, 2019; Parsons et al., 2020).

The conventional mode is spinal anesthesia, but as patients are put in a lithotomy position for surgery, there is a risk of vasodilatation because of the sympathetic blockade that results in diminished venous return and subsequently causes hypotension (Kim et al., 2021). This problem can be overcome using vasopressors and IV fluids, but even access to these may be dangerous for elderly patients with compromised cardio-pulmonary health (Sivasankari, 2020). Conversely, the saddle block is just like the spinal, but it affects only pelvic muscles and sacral nerves, which helps

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achieve the desired analgesia, reducing the need for IV fluids or vasopressors (Bamigboye et al., 2021).

A study showed that the average time of induction was 22.2 ± 3.01 mmHg vs. 6.73 ± 3.96, whereas the requirement for vasopressors was 120 ± 30.9 µg vs. 7.78 ± 2.60 µg in patients who received spinal anesthesia vs. saddle block respectively. The rationale of my study is that TURP is a commonly performed procedure, and it is highly necessary to know the best method of anesthesia for this procedure with minimum side effects and complications. As no local study is available on this topic from our country, my trial can help generate evidence from our setup for this procedure. This study can help us to find the best and safest method of anesthesia for the TURP procedure so that guidelines can be delineated for the choice of anesthesia in TURP. If saddle block is better than spinal anesthesia, we may use it routinely for TURP procedures, although we use this saddle technique in certain patients

Methodology

This randomized controlled trial was conducted at the Anesthesia Department, Jinnah Hospital Lahore, for Six months on 120 cases (group 1: 60, group 2: 60), calculated with 95% confidence interval, 80% power of test, and the expected percentage of mean arterial pressure among patients receiving spinal anesthesia as 22.2 ± 3.01 and saddle block as 6.73 ± 3.96. 7. All male patients aged 40-80 years undergoing TURP surgery on the elective list and falling in American Society of Anesthesiologists (ASA) physical status I and II were included. Patients with ASA status >II or infection at the site of the lumbar region at the back and known cases of Coagulopathy were excluded from the study.

After obtaining informed consent, patients were randomly divided into two groups: group A) Spinal anesthesia and group B) Saddle block by lottery method. Demographic and clinical details of all patients were taken according to the researcher's operational definitions on a proforma.

Patients in both groups were pre-medicated with Normal Saline 500ml. Their baseline heart rate and Blood pressure were noted, and mean arterial pressure was calculated. Patients in group A received 2 ml of 0.75% bupivacaine with 25 gaze pencil point tip needle at L3-L4 inter-vertebral space via midline in a sitting position after ensuring free flow of cerebrospinal fluid. Patients were placed supine with one pillow after administration of the drug in the subarachnoid space. Patients in Group B received 2 ml of hyperbaric 0.75% in the same manner as Group A but remained sitting for 10 minutes and then were made supine with one pillow under the head. Then, the surgical procedure was started, and mean arterial pressure was noted every 10 minutes till the end of the procedure. If the mean arterial pressure falls >20% of the baseline, i.v phenylephrine at a dose of 50 mcg was given. If not settled, the same dose was repeated. Mean atrial pressure on the baseline and mean atrial pressure at the end of the procedure were taken to compare the two groups. Effect modifiers like age and history of hypertension were addressed through stratification.

The collected data was entered and analyzed accordingly using SPSS version 20. Frequencies and percentages were calculated for qualitative variables like H/o hypertension and Vasopressor required (yes/no). Mean and standard deviation were calculated for quantitative values like age, baseline mean arterial pressure, fall in mean arterial pressure, and requirement for Vasopressor. Student t-test was used to compare these variables in both groups. Stratification for age and H/o hypertension (yes/no) was done, and a Student t-test was used to compare these variables in both groups. Statistical significance was considered as p-value < 0.05

Results

Overall, the mean age was 60.39 ± 11.80 years. The mean age in the Spinal anesthesia group was 61.23 ± 12.06 years, while the mean age in the Saddle block group was 59.55 ± 11.57 years. In spinal anesthesia, 30(50%) cases had a history of hypertension, and in the Saddle block group, 27(45%) cases had a history of hypertension. In the Spinal and Saddle blocks, the mean arterial pressure before the procedure was 102.60 ± 5.33 and 95.52 ± 4.52, respectively. The mean change in MAP in the spinal group was 20.02 ± 5.76, and in the Saddle block group was 10.95 ± 5.93, with statistically lower mean change in the Saddle block groups, p-value < 0.001. In the spinal anesthesia group, 33(55%) cases had Vasopressor, and 9(15%) cases had Vasopressor in the saddle block group. The mean vasopressor requirement in Spinal anesthesia was 102.18 ± 19.17, and in Saddle block was 30.67 ± 26.46, respectively. The mean vasopressor requirement was statistically higher in the spinal anesthesia group than in the Saddle block, p-value < 0. In 40-60 years cases, the mean arterial change was statistically higher in the spinal anesthesia group (19.69 ± 6.55) as compared to the Saddle block group (9.53 ± 6.15), with p-value < 0.001, while in 61-80 years cases, the mean change in arterial pressure was also statistically higher in spinal (20.32 ± 4.99) as compared to Saddle block group (12.37 ± 5.44), p-value < 0.001.

When stratified for ASA status, in ASA I, the mean arterial change was statistically higher in the spinal anesthesia group (19.70 ± 6.55) as compared to the Saddle block group (10.64 ± 6.11), p-value < 0.001. In contrast, in ASA II, the mean change in arterial pressure was also statistically higher in spinal (20.33 ± 4.93) as compared to the Saddle block group (11.34 ± 5.76), p-value < 0.001. In cases with h/o hypertension, the mean arterial change was statistically higher in the spinal anesthesia group (20.76 ± 5.63) as compared to the Saddle block group (12.11 ± 5.85), p-value < 0.001 while in cases which do not have h/o hypertension the mean change in arterial pressure was also statistically higher in spinal (19.27±5.87) as compared to Saddle block group (10 ± 5.90), p-value < 0.001. In 40-60 years cases, the mean requirement of Vasopressor was statistically higher in the spinal anesthesia group (103.56 ± 13.77) as compared to the Saddle block group (31.67 ± 31.99), p-value < 0.001 while in 61-80 years cases, the mean requirement of Vasopressor was also statistically higher in spinal (100.88 ± 23.53) as compared to Saddle block group (28.67 ± 15.28), p-value < 0.001.

When stratified for ASA status, in ASA I, the mean requirement of Vasopressor was statistically higher in spinal anesthesia group (103.56 ± 13.77) as compared to Saddle block group (31.67 ± 31.99), p-value < 0.001 while in ASA II, the mean requirement of Vasopressor was also statistically higher in spinal (100.88 ± 23.53) as compared to Saddle block group (28.67 ± 15.28), p-value < 0.001. In

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cases with h/o hypertension, the mean requirement of Vasopressor was statistically higher in the spinal anesthesia group (100.62 ± 21.04) as compared to the Saddle block group (17.83 ± 8.30), p-value < 0.001 while in cases which do not have h/o hypertension the mean change in arterial pressure was also statistically higher in spinal (103.65 ± 17.76) as compared to Saddle block group (56.33 ± 33.86), p-value < 0.001.

Table -1: Descriptive Statistics of age (years), MAP before, change in MAP, and requirement of Vasopressor in both study groups [n=120]

	Study design	Mean	S.D	Minimum	Maximum	t-test	p-value
Age (years)	*Spinal Anes (n=60)*	61.23	12.06	40.00	80.00	0.779	0.437
	Saddle block (n=60)	59.55	11.57	40.00	80.00		
MAP before	*Spinal Anes (n=60)*	102.60	5.33	91.00	110.00		
	Saddle block (n=60)	95.52	4.52	90.00	108.00		
Change in MAP	*Spinal Anes (n=60)*	20.02	5.76	9.00	31.00	8.50	< 0.001**
	Saddle block (n=60)	10.95	5.93	0.00	23.00		
Requirement of Vasopressor	*Spinal Anes (n=33)*	102.18	19.17	45.00	138.00	9.12	< 0.001**
	Saddle block (n=9)	30.67	26.46	10.00	95.00		

Table -2: Comparison of change in MAP in both study groups concerning age groups, ASA status, and H/O hypertension [n=120]

		Groups	No.	Mean	S.D	p-value
Age groups	***40-60 (years)***	***Spinal Anesthesia***	29	19.69	6.55	<0.001**
		Saddle block	30	9.53	6.15	
	61-80 (years)	***Spinal Anesthesia***	31	20.32	4.99	<0.001**
		Saddle block	30	12.37	5.44	
ASA status	***I***	***Spinal Anesthesia***	30	19.70	6.55	<0.001**
		Saddle block	34	10.64	6.11	
	II	***Spinal Anesthesia***	30	20.33	4.93	<0.001**
		Saddle block	26	11.34	5.76	
H / O Hypertension	***Yes***	***Spinal Anesthesia***	30	20.77	5.63	<0.001**
		Saddle block	27	12.11	5.85	
	No	***Spinal Anesthesia***	30	19.27	5.87	<0.001**
		Saddle block	33	10.00	5.90	

Table -3: Comparison of mean vasopressor requirement in both study groups concerning age groups, ASA status, and H/O hypertension [n=42]

		Groups	No.	Mean	S.D	p-value
Age groups	***40-60 (years)***	***Spinal Anesthesia***	17	99.65	21.66	<0.001**
		Saddle block	4	37.25	39.76	
	61-80 (years)	***Spinal Anesthesia***	16	104.88	16.39	<0.001**
		Saddle block	5	25.40	11.70	
ASA status	***I***	***Spinal Anesthesia***	16	103.56	13.77	<0.001**
		Saddle block	6	31.67	31.99	
	II	***Spinal Anesthesia***	17	100.88	23.53	<0.001**
		Saddle block	3	28.67	15.28	
H / O Hypertension	***Yes***	***Spinal Anesthesia***	16	100.62	21.04	<0.001*
		Saddle block	6	17.83	8.30	
	No	***Spinal Anesthesia***	17	103.65	17.76	0.001*
		Saddle block	3	56.33	33.86	

Discussion

Benign prostatic hyperplasia (BPH) is a common problem experienced by 1 in 4 men over 80 years worldwide (Rastrelli et al., 2019). Although no cut-off value is set to define large prostate glands, as a rule of thumb, prostate size between 15–30 ml is considered "Normal" among adult males, whereas size above 30 is thought to be "large" (Bilhim et al., 2022). Still, the role of clinicians in diagnosing large prostate is imperative as it varies from subject to subject and also by the extent of hyperplasia (Vickman et al., 2020). BPH causes several complications, but Lower urinary tract symptoms (LUTS) are the most common and irritating for patients, causing incontinence, irritancy, turbulent urinary stream, frequent urination, pain, and discomfort (Zhang et al., 2022). Although the first-line management of BPH is tried through non-invasive methods, sometimes surgery becomes inevitable (De Nunzio et al., 2020). Transurethral resection of the prostate (TURP) is assumed to be the gold-standard surgical treatment for BPH (Lokeshwar et al., 2019). It is preferable, especially for patients who have hypertension, kidney dysfunction,

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circulatory issues, and breathing problems (Huang et al., 2019). However, stable anesthesia is important in such patients to keep hemodynamic differences at a minimum. Usually, spinal anesthesia is given to patients, but studies have reported saddle block to be more effective (Kshetrapal et al., 2021). Hence, this study compares the effectiveness of the two methods in patients undergoing TURP. In the current study, the mean age was 60.39 ± 11.80 years. The mean age in the Spinal anesthesia group was 61.23 ± 12.06 years, while the mean age in the Saddle block group was 59.55 ± 11.57 years. Another study reported almost similar age distribution, i.e., in the spinal group, the mean age was 62.64 ± 3.83 years, and in the Saddle group, the mean age was 63.33 ± 4.16 years (Bhattacharyya et al., 2015). The mean change in MAP in the spinal group was 20.02 ± 5.76, and in the Saddle block group was 10.95 ± 5.93, with statistically lower mean change in Saddle block groups, p-value < 0.001. In the spinal anesthesia group, 33(55%) cases had Vasopre, and 9(15%) cases had Vasopressor in the saddle block group. The mean vasopressor requirement in Spinal anesthesia was 102.18 ± 19.17, and in Saddle block was 30.67 ± 26.46, respectively. The mean vasopressor requirement was statistically higher in the spinal anesthesia group than in the Saddle block, p-value < 0.001. Similar findings are reported by another study that significant mean arterial pressure at the induction was 22.2±3.01 mmHg compared to 6.73±3.96 in patients who received spinal anesthesia vs. saddle block.

In contrast, the average requirement for Vasopressor was 120±30.9µg compared to 7.78±2.60µg in patients with spinal vs. saddle block (Bhattacharyya et al., 2015). Recently, a study compared hemodynamic changes and surgical conditions among the two groups, i.e., saddle block vs subarachnoid block during TURP on 90 elderly patients (45 in each group) between 50-70 years. They reported that the frequency of vasopressor requirement and hypotension was statistically lesser (P<0.01) than in group B. satisfactory surgical conditions were achieved in both groups equally. The study concluded that saddle block is a safe and effective alternative to spinal anesthesia during TURP (Bhattacharyya et al., 2015). One other study compared the role of three types of anesthesia on 93 patients giving epidural anesthesia, spinal anesthesia, and saddle block to 31 in each group. They found statistical differences in reaching complete and motor blocks (p-value<0.001). Hence, they reported that saddle block has significant advantage over the rest of two types in reaching stable haemodynamics, adequate anesthesia, and lesser motor blockage as well as as no full blockage among patients (Moosavi Tekya et al., 2006). Another similar study compared the three types of anesthesia in 77 patients and found significant lower HR level after 15 minutes of rehydration in all groups (p<0.05). Average time for achieving maximum block was lowest in saddle block group (p<0.0001) and significant difference in average motor block (p<0.0001) (Özmen et al., 2003). All these studies have proved saddle block as an effective and safe alternative for spinal anesthesia in elderly males undergoing TURP.

Conclusion

The findings of this study concluded that the mean change in mean arterial pressure and the mean requirement of Vasopressor (phenylephrine) among patients undergoing TURP Saddle block was favorable. So, TURP can be safely performed under saddle block without hypotension and less vasopressor requirement.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate.
Approved by the department Concerned.
Consent for publication
Approved
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Not applicable

Conflict of interest

The authors declared an absence of conflict of interest.

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