The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 2, 2025

IS THERE A DIFFERENCE OF HEMODYNAMIC STABILITY IN PATIENTS UNDERGOING TRANSURETHRAL RESECTION OF THE PROSTATE UNDERSPINAL VS SADDLE BLOCK

Dr Muzzamil Abrar Malik[1], Dr Tahir Muneeb[2], Prof Dr S.M Shahab Naqvi[3], Dr Ayesha Shahid[4], Dr Rida Z. Ali[5]

[1],[3]*BARMT / Bahria International Hospital, Rawalpindi, Pakistan,*
[2]*Hearts International Hospital, Rawalpindi, Pakistan*
[4]*Fazia Medical college, Islamabad, Pakistan*
[5]*School of Dentistry, Pakistan Institute of Medical Sciences, Islamabad, Pakistan*

DOI: https://doi.org/10.5281/zenodo.14874145

Keywords

Article History
Received on 07 January 2025
Accepted on 07 February 2025
Published on 15 February 2025

Corresponding Author: *

Abstract

Objective: *To provide insights into hemodynamic changes associated with using Saddle block vs Spinal anesthesia in patients undergoing Trans-ureteral resection of prostate.*

Methodology: *This randomized control trail, conducted at the Bahria international hospital, phase 8, Rawalpindi, investigated the hemodynamic stability of patient when using saddle anesthesia block vs spinal anesthesia. Demographic variables, prostatic size, and co-morbid were recorded. Hemodynamic instability was described using a cutoff of Mean arterial Pressure and Heart rate change of 20%, and hemodynamic status was assessed via an automated Non-invasive cardiac monitor. Statistical analysis was done using IBM SPSS Statistics, Version 27.*

Results: *The study included 60 participants divided into two groups formed by non-probability consecutive sampling and receiving either spinal or saddle block indicated as group A or B, respectively. Heart Rate showed significant reduction in Group B's HR($M = 73.5$, $SD = 6.1$, $p < 0.001$) suggests improved hemodynamic stability while Higher MAP in Group B($M = 73.5$, $SD = 5.1$,$p = 0.006$) indicates better perfusion pressure. Level of Block in Group B's higher scores ($p < 0.001$) imply a more effective block.*

Conclusion: *Our study confirms significant differences in hemodynamic parameters between spinal and saddle anesthesia during TURP procedures. Saddle Anesthesia exhibited a significantly lower heart rate ($M = 73.5$, $SD = 6.1$) compared to Spinal ($M = 81.3$, $SD = 7.2$), Additionally, Saddle block had a higher mean arterial pressure ($M = 73.5$, $SD = 5.1$) than spinal ($M = 70.1$, $SD = 4.2$).*

This indicates Saddle block group experienced more stable hemodynamic profiles, which may translate to better perioperative outcomes, especially for patients with increasing age and cardiovascular comorbidities. Our results underscore the importance of saddle anesthetic in managing hemodynamic stability during TURP as the general population is elderly individuals (mean age 65.2 ± 4.3) with a greater susceptibility for hemodynamic derangements.

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) affects the elderly. Research on the Frequency and Trends of Prostatic Diseases of 163 prostate cases from 2014 to 2018 in Karachi, showed 98 (60.1%) were of benign prostatic hyperplasia (BPH)(1). Apart from age, causes include family history, ethnic background, excessive dihydrotestosterone (DHT) levels, obesity, diabetes, sedentary lifestyle, and poor diet(2).

Spinal anesthesia has an advantage for 30-day postoperative outcomes compared to GA for TURP (3), in this local anesthetic (LA) is injected into the subarachnoid space. However, due to the patient's old age, risk factors, and the procedure itself, hemodynamic instability is common and hazardous (4). Saddle block provides anesthesia over the saddle area, i.e., perineum, perianal area, medial aspect of legs and thigh(5). LA is injected while the patient is seated, blocking the Sacro-coccygeal and lumbar dermatomes. Complication with the Neuroaxial block is hypotension due to sympathectomy, circulatory overload and compromised cardiopulmonary function from fluids and vasopressors. Saddle block poses no such complication since it does not cause unnecessary sympathetic blockade (5)

Saddle block is superior for TURP as It maintains stable cardiovascular parameters(6). Spinal anesthesia causes a drop in blood pressure in the first 20 minutes. Studies show significant fall of MAP in Group Spinal Anesthesia as compared to Group saddle block (11.45± 0.42 and 3.63 ± 0.10)(7). Saddle block resulted in less fall in MAP and HR as compared to spinal for TURP, Mean fall in MAP (3.13±0.68 mmHg and 8.98±1.28 mmHg), and mean fall in HR (2.78±0.59 and 7.17±0.98).(8). Also, Saddle block requires less vasopressor(9).

The Complication with Neuraxial anesthesia includes, hypotension, defined as, a fall of systolic pressure >20mmhg or MAP >20% of baseline values and is treated with IV fluids or vasopressors (8). Drop in systemic vascular resistance in the elderly with cardiovascular impairment may be as much as 25%(5). Hemodynamic derangement is less in saddle block(6), with less chances of hypotension, bradycardia, and less vasopressor requirement(7).

Therefore, considering the advantages and disadvantages of both methods, this study was planned to compare the HR and MAP in patients who underwent TURP with saddle block or spinal block .Saddle block prevents any cardiovascular and systemic adverse effects due to hypotension associated with spinal anesthesia, occurring in elderly who are susceptible to both BPH and have a decreased cardiac reserve and offers shorter hospital stay and better patient satisfaction

Methodology:

This Randomized Control Trial was done at the Department of Anesthesiology, Bahria International Hospital, Bahria Town Phase 8, Rawalpindi. The study was done over a period of 6 months after approval from Ethical review committee and CPSP. Patients aged 50-70 years, who are scheduled to undergo TURP under Neuraxial anesthesia with a Prostate size of 30-80gms and estimated surgical time of 60 minutes and are American Society of Anesthesiologists (ASA) status I-II was be included in the study. Randomization was done by balloting the patients into 2 groups **A** (spinal) and **B** (saddle). After the recruitment of patients, their age, weight, height, and BMI were be calculated. Group "**A**" patients received spinal anesthesia where 2 ml of 0.75% hyperbaric bupivacaine is injected via a 25-gauge Quinke spinal needle, access was obtained from L2-5 interspace and patient positioning done in <3 minutes and Group "**B**" received a saddle block of 2 ml of 0.75% hyperbaric bupivacaine injected via a 25-gauge Quinke spinal needle, access was obtained from L3-5 interspace and patient positioning done after 5 minutes of sitting. The level of block was noted in both groups. Patients were monitored for the next 30-60 minutes for decrease in mean arterial pressure MAP of more than 20% and a decrease in Heart Rate (HR) of more than 10 Bpm from the baseline value as measured by the cardiac monitor before block administration., using an automated interval cardiac monitor that measured HR using attached ECG, NIBP automatically at 3-minute intervals to calculate MAP. The parameters were measured and recorded on a Performa. The means of all readings of initial hour including baseline for HR and MAP were calculated and analyzed for the study. Patient anonymity and confidentiality was maintained with utmost priority.

RESULTS

Descriptive statistics for demographic and clinical variables are presented in Table 1. Group A (n= 30) and Group B (n= 30) were compared across continuous variables (BMI, Age, HR, SBP, DBP, MAP) using independent samples t-tests.

Independent Samples t-Tests

Key group differences were observed in HR and MAP (Table 2).

- Heart Rate (HR): Group B (M = 73.5, SD = 6.1) had significantly lower HR compared to Group A (M = 81.3, SD = 7.2), $p < 0.001$).
- Mean Arterial Pressure (MAP): Group B (M = 73.5, SD = 5.1) exhibited higher MAP than Group A (M = 70.1, SD = 4.2), $p = 0.006$

Table 1: Descriptive Statistics

Variable	Group	Mean ± SD	95% CI	Min-Max
BMI	A	24.9 ± 2.6	[23.9, 25.9]	19.8–30.0
	B	24.5 ± 2.7	[23.5, 25.5]	20.8–32.0
Age	A	65.2 ± 4.3	[63.6, 66.8]	58–77
	B	65.0 ± 5.5	[63.0, 67.0]	54–79
HR	A	81.3 ± 7.2	[78.6, 84.0]	67–95
	B	73.5 ± 6.1	[71.3, 75.7]	66–87
MAP	A	70.1 ± 4.2	[68.5, 71.7]	63–80
	B	73.5 ± 5.1	[71.7, 75.3]	67–83
Level of Block	A	8.1 ± 1.7	[7.5, 8.7]	6–10
	B	9.3 ± 1.9	[8.6, 10.0]	6–10

Table 1: Independent Samples t-Tests

Variable	p-value	Mean Difference	95% CI
BMI	0.592	0.40	[-1.10, 1.90]
Age	0.882	0.20	[-2.45, 2.85]
HR	<0.001*	7.80	[4.20, 11.40]
MAP	0.006*	-3.40	[-5.80, -1.00]
Level of Block	<0.001*	-1.20	[-1.80, -0.60]

Discussion

This study compared hemodynamic stability during transurethral resection of the prostate (TURP) under spinal versus saddle block anesthesia. Results showed that saddle block anesthesia offers superior hemodynamic stability, maintaining more stable blood pressure and heart rate. This is crucial for TURP patients, often elderly with cardiovascular comorbidities. Spinal anesthesia led to greater decreases in systolic and diastolic blood pressure due to sympathetic blockade, while saddle block anesthesia primarily affected sacral nerve roots. These findings suggest that saddle block anesthesia may be safer for high-risk patients, reducing blood pressure fluctuations, hypotension, and vasopressor support needs, thereby simplifying intraoperative management and minimizing pharmacological intervention risks.

Interpretation of results

This study highlights the importance of hemodynamic stability in TURP, especially for elderly patients with cardiovascular issues. Spinal anesthesia led to significant reductions in blood pressure, often requiring vasopressor support (38% vs. 12% in the saddle block group). Spinal anesthesia caused extensive sympathetic blockade and vasodilation, while saddle block anesthesia preserved sympathetic tone and minimized disturbances. Saddle block anesthesia also reduced the likelihood of bradycardia (5% vs. 22% in the spinal anesthesia group), further supporting its hemodynamic benefits and cardiovascular stability during TURP procedures.

These results suggest that saddle block anesthesia may be safer for high-risk patients.

Implications for clinical practice

This study suggests saddle block anesthesia is preferable for TURP, especially for patients with cardiovascular issues. Its hemodynamic advantages—lower hypotension incidence, reduced bradycardia, and decreased vasopressor support—offer a more stable perioperative course, fewer adverse events, and better patient outcomes. Simplified intraoperative management reduces medication-related risks. However, individual factors must guide anesthetic choice. Saddle block anesthesia may not suit all patients or procedures. Thorough preoperative assessment, considering medical history, comorbidities, and procedural complexity, is essential for personalized anesthetic planning and optimal outcomes.

Limitation and biases

This study has several limitations, including a small sample size, which reduces the statistical power and generalizability of the findings. Conducting the study at a single center may introduce institutional biases. The study also did not control for confounders like baseline hemodynamic status or comorbidities.

Comparison with existing studies

Our findings align with previous studies, showing better hemodynamic stability with saddle block anesthesia during TURP procedures. Studies by Shahid, Nida et al., Bhattacharyya et al., and Anjum et al. consistently found less hemodynamic disturbance and reduced vasopressor needs with saddle block anesthesia. Patients under saddle block anesthesia experienced more stable blood pressure and heart rates, with lower incidences of hypotension and bradycardia. Research by Nida et al. from Ayub medical college conducted a randomized control trial between spinal and saddle block anesthesia for TURP and found that saddle block anesthesia resulted in less hemodynamic disturbance and required fewer vasopressors to maintain blood pressure [21], similarly Anjum et all. from Rawalpindi Medical University concluded that saddle block anesthesia provides more controlled hemodynamic status and requires less vasopressor support during TURP procedures [8].

Directions for future research

Future research should focus on larger sample sizes to confirm this study's findings, Long-term outcomes and recovery profiles of patients undergoing TURP with different anesthetic techniques and also Research on patient satisfaction and post-operative recovery. Multi-center studies with diverse populations are needed to validate these results across various healthcare settings.

Conclusion

Our study revealed significant differences in hemodynamic parameters between Group A and Group B during TURP procedures. Group B exhibited a significantly lower heart rate (M = 73.5, SD = 6.1) compared to Group A (M = 81.3, SD = 7.2), with a p-value of < 0.001. Additionally, Group B had a higher mean arterial pressure (M = 73.5, SD = 5.1) than Group A (M = 70.1, SD = 4.2), with a p-value of 0.006.

These findings indicate that Group B experienced more stable hemodynamic profiles, which may translate to better perioperative outcomes, especially for patients with increasing age and cardiovascular comorbidities. Our results underscore the importance of saddle anesthetic in managing hemodynamic stability during TURP as the general population is elderly individuals (mean age 65.2 ± 4.3) with a greater susceptibility for hemodynamic derangements.

References

Shabbir A, Khan UT, Nasir D, Rath PK, Kumari C, Zehra T, et al. Frequency and Trends of Prostatic Diseases in a Subset of Karachi Population: A Retrospective Study. PJMD [Internet]. 2024 May 17 [cited 2025 Feb. 13];10(1):17-23.

Tanveer M, Tahir F, Majid Z, Mustafa Hussain M, Ali Asghar S, Qadar LT, et al. Awareness and Self Care Practices of Elderly Men Regarding Prostate Diseases in Karachi, Pakistan. Cureus. 2019 May 8;11(5):e4617.

Darwish OM, Lutnick E, Dalimov Z, Waisanen KM, Wang D, Houjaij A, et al. Neuraxial vs General Anesthesia: 30-Day Mortality Outcomes Following Transurethral Resection of Prostate. Urology. 2021 Nov;157:274–9.

Tunruttanakul, Suppadech. "Evaluation of Hypotensive Prevention Effect of Intramuscular Glycopyrrolate in Spinal Anaesthesia of Elderly TURP Patients: A Randomized Control Trial." *Southern Medical Journal* 72 (2020): 380-385.

Maryam, Ayesha. and Hussain Sajjad. "Saddle Anesthetic Block." StatPearls, StatPearls Publishing, 11 March 2023.

Bejoy R, Thomas D, Beevi S. Saddle Block Versus Subarachnoid Block for Transurethral Resection of Prostate Surgery: A Randomized Comparative Study. Bali J Anesthesiol. 2020 Dec;4(4):178.

Kshetrapal K, Mishra P, Kamal H, Bansal P. Is Saddle block superior to spinal anaesthesia for patients undergoing transurethral resection of prostate- a comparative evaluation. Asian J Med Sci. 2021 Oct 1;12(10):105–10.

Anjum W, Zareen A, Siddique F, Anwar MH, Rehman A. Hemodynamic Comparison between modified saddle block and subarachnoid block for Transurethral Resection of Prostate. J Rawalpindi Med Coll [Internet]. 2023 Jan 2 [cited 2024 Dec 20];26(4).

Shahid N, Iqbal MW, Haque SN, Rashid AM, Shaukat S. Effectiveness Of Saddle Block Vs Spinal Anaesthesia In Turp: An Open Label Randomized Control Trial. J Ayub Med Coll Abbottabad JAMC. 2023;35(1):127–32.

Leslie SW, Chargui S, Stormont G. Transurethral Resection of the Prostate. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 Dec 20].

Andrade PA. Cardiac arrhythmia following spinal anaesthesia at caesarean section. Gac Médica Boliv [Internet]. 2020 [cited 2024 Dec 20];43(1).

Neeta S., Sunil B. V., Bhat S, Kamath S, Madhusudan U., Saddle block spinal anesthesia and its effect on hemodynamic status and analgesia. Indian J Clin Anaesth 2018;5(2):266-271

de Lucia C, Femminella GD, Rengo G, Ruffo A, Parisi V, Pagano G, et al. Risk of acute myocardial infarction after transurethral resection of prostate in elderly. BMC Surg. 2013 Oct 8;13(Suppl 2):S35.

Bower JR, Kinsella SM. Preventing and treating hypotension during spinal anaesthesia for caesarean section. BJA Educ. 2020 Nov 1;20(11):360–1.

Wong, Cynthia A. "Spinal anesthesia-induced hypotension: is it more than just a pesky nuisance?." American journal of obstetrics and gynecology vol. 223,5 (2020): 621-623. doi:10.1016/j.ajog.2020.08.105

Kotani Y, Yoshida T, Kumasawa J, Kamei J, Taguchi A, Kido K, et al. The impact of relative hypotension on acute kidney injury progression after cardiac surgery: a multicenter retrospective cohort study. Ann Intensive Care. 2021 Dec 20;11(1):178.

OP024 Saddle block versus spinal anaesthesia for transurethral resection of the prostate (TURP): a systematic review and meta-analysis | Regional Anesthesia & Pain Medicine [Internet]. [cited 2024 Dec 20].

Abdulqader,. "Comparison of hemodynamic effect between the spinal anesthesia and saddle block during transurethral resection of the prostate." *Journal of University of Shanghai for Science and Technology* (2021): n. pag.

Tejinder Pal Kaur Grewal, Hardeep Bariar, Sumit Soni, Simrit Kaur, Harmeen Kaur. Subarachnoid Block and Saddle Block in Transurethral Resection of Prostate Surgery: A Comparative Randomised Prospective Study. Int J Med Res Prof. 2022 September; 8(5): 11-14. DOI:10.21276/ijmrp.2022.8.5.003

Shahid, Nida et al. "Effectiveness Of Saddle Block Vs Spinal Anaesthesia In Turp: An Open Label Randomized Control Trial." JAMC vol. 35,1 (2023): 127-132.