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ORIGINAL ARTICLE

Comparison of the results of monopolar and bipolar transurethral resection of prostate.

Mudassar Saeed Pansota[1], Muhammad Shahzad Saleem[2], Hafiz Muhammad Tariq[3], Muhammad Ajmal Malik[4], Mumtaz Rasool[5]

ABSTRACT… Objective: To compare the results of using bipolar versus monopolar diathermy during TURP. **Study Design:** Comparative, Cross-sectional study. **Setting:** Department of Urology, Shahida Islam Teaching Hospital, Lodhran. **Period:** January 2025 to June 2025. **Methods:** Total 98 male patients weighing 40 to 80 grams who have an enlarged prostate and mild to severe LUTS were all included. Exclusion criteria were uremia, bleeding disorders, untreated urinary tract infections, prostate cancer (Abnormal DRE), and prior prostate surgery. Forty-nine patients had monopolar TURP treatment using 1.5% glycine as an irrigating solution in group A, and forty-nine patients received bipolar TURP treatment using normal saline as an irrigating solution in group B. Hemoglobin levels from blood samples obtained before to spinal anesthesia and six hours after surgery were subtracted to determine the drop in hemoglobin levels. By deducting the sodium level from blood samples obtained prior to spinal anesthesia and six hours after surgery, the difference in serum sodium levels was evaluated. If the postoperative serum sodium content was less than 125 mmol/l, or if the clinical symptoms were evaluated, TURP syndrome was diagnosed. **Results:** In our investigation, the bipolar group experienced a drop in hemoglobin (g/dl) of 0.73 ± 0.19 and a mean operative time of 32.49 ± 7.05 minutes and 1.69 ± 0.35 (g/dl) compared to 25.63 ± 5.38 minutes and 0.73 ± 0.19 (g/dl) for the monopolar group. The mean decrease in serum sodium levels (mEq/L) for the bipolar group was significantly less than that of the monopolar group (3.46 ± 0.74 vs. 1.06 ± 0.22 mEq/L). The B-TURP group did not exhibit TUR syndrome (p = 0.153), but 02 (4.08%) individuals in the M-TURP group exhibited TUR syndrome in our study. **Conclusion:** According to this study, TUR-P syndrome, a decline in serum sodium levels, and hemoglobin levels are less common after bipolar TURP than after monopolar TURP.

Key words: Benign Prostatic Hyperplasia, Hemoglobin, Transurethral Resection.

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INTRODUCTION

More than 50% of men over 60 have histologically confirmed benign prostatic hyperplasia (BPH), and at least half of them have moderate to severe lower urinary tract symptoms. BPH is a very common issue in older men.[1] LUTS with a preponderance of voiding symptoms is the initial presentation of BPH. Incomplete emptying, urinary hesitancy, weak stream, frequency, and urgency are some of the escalating symptoms that patients may encounter, which can vary from nocturia to acute urine retention. Decompensation of the bladder and detrusor may eventually result from chronic or long-term bladder outflow obstruction (BOO).[2,3]

The transurethral excision of the prostate using bipolar electrocautery with normal saline is a better way to surgically treat BPH.[4] Even if there are other ways to treat BPH surgically, transurethral resection of the prostate (TURP) is still the best way. The best way to surgically treat BPH is by monopolar transurethral resection of the prostate (M-TURP).[5] M-TURP is still the most common surgery for BPH, even if there are other options. It is believed that bipolar TURP (B-TURP) can stop the TUR syndrome and dilutional hyponatremia that happen with M-TURP since B-TURP uses isotonic saline as an irrigant.[6,7]

Since these two techniques are often employed for transurethral resection of the prostate in the majority of Pakistani medical facilities, the outcomes of the published randomized controlled trials on this topic have been inconsistent. This study compares the results of using bipolar versus monopolar diathermy during prostate transurethral resection.

1. MS (Urology), Associate Professor Urology, Shahida Islam Medical & Dental College/Teaching Hospital, Lodhran.
2. FCPS (Urology), Assistant Professor Urology and Renal Transplantation, Bahawal Victoria Hospital/Quaid-e-Azam Medical College, Bahawalpur.
3. FCPS (Urology), Assistant Professor Urology and Renal Transplantation, Bahawal Victoria Hospital/Quaid-e-Azam Medical College, Bahawalpur.
4. FCPS (Urology), Assistant Professor Urology and Renal Transplantation, Bahawal Victoria Hospital/Quaid-e-Azam Medical College, Bahawalpur.
5. FCPS (Urology), Professor Urology and Renal Transplantation, Bahawal Victoria Hospital/Quaid-e-Azam Medical College, Bahawalpur.

Correspondence Address:
Dr. Mudassar Saeed Pansota
Shahida Islam Medical College, Lodhran.
netygeulis749@hotmail.com

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My study's findings will assist resolve earlier contentious findings and be a very helpful addition to the body of existing material. Based on these findings, we can then regularly implement the approach that produces the best benefits for these specific individuals in our general practice to lower the population's morbidity.

METHODS

This comparative cross-sectional study was conducted from January to June 2025 by the Department of Urology at Shahida Islam Teaching Hospital in Lodhran. The trial was approved by the ethical review committee (SIMC/ET.C/0048/24-6-12-24) prior to its commencement. The Sample size was calculated by taking peri-operative change in mean serum sodium concentration for the two groups is 137.4 ± 5.4 for monopolar TURP and 139.8 ± 2.6 for bipolar TURP[8], with a 95% confidence interval. Ratio (Group1/Group2) = 1, Power = 80%, 98 is the estimated sample size (49 in each category). Male patients weighing 40 to 80 grams who have an enlarged prostate and mild to severe LUTS. LUTS measured by IPSS, size by abdominal USG, recurrent UTIs brought on by BPH, and urine retention that is not improving with medication were all included. Exclusion criteria were uremia, bleeding disorders, untreated urinary tract infections, prostate cancer (Abnormal DRE), and prior prostate surgery.

Patient demographic data, including age, was documented and informed written consent was acquired. The ninety-eight patients were split into two groups: forty-nine patients had monopolar TURP treatment using 1.5% glycine as an irrigating solution in group A, and forty-nine patients received bipolar TURP treatment using normal saline as an irrigating solution in group B. Every patient who was enrolled had their IPSS score recorded. Laboratory tests, including hemoglobin and serum electrolyte levels, were documented both before and after surgery. All of the patients received conventional care, which included preoperative antibiotic medication based on sensitivity pattern in cases where a urine culture revealed infection. One day before surgery, the antibiotic was started, and it was taken for five days after the procedure. Results of a cystoscopy were evaluated, including bladder trabeculations, median lobe size, and prostate size. A 26 Fr KARL STORZ resectoscope will be used for B-TURP and M-TURP procedures. Operational duration in minutes (from resectoscope insertion to Foley's insertion) is recorded. Following the procedure, a 22 Fr 3 way Foley's catheter was placed in each patient, and bladder irrigation with regular saline was continued until the hematuria subsided. Hemoglobin levels from blood samples obtained before to spinal anesthesia and six hours after surgery were subtracted to determine the drop in hemoglobin levels. By deducting the sodium level from blood samples obtained prior to spinal anesthesia and six hours after surgery, the difference in serum sodium levels was evaluated. If the postoperative serum sodium content was less than 125 mmol/l, or if the clinical symptoms were evaluated, TURP syndrome (existence of each and every one of the following i.e., sodium of less than 125 mmol/l following TURP accompanied by two or more of the following symptoms: bradycardia (heart rate less than 50 beats per minute), hypotension (20 percent drop in blood pressure from pre-induction levels), mental confusion (disorientation in time and space), or vomiting (expulsion of stomach contents and more than two episodes) within 12 hours after surgery) was diagnosed.

Patients and guardians gave their informed permission (performa attached). Participants in the study were granted complete autonomy over their inclusion. All study participants' data and information were kept private and confidential. It is anticipated that study participants would not suffer any harm, and the results will be beneficial to them. The researcher guaranteed nonmaleficence. The author has disclosed no conflicts of interest, and the project has not received any funding.

SPSS v25.0 was used to analyze the data. Qualitative factors, such as surgery type and gender, were displayed as frequency and percentage. The mean ± standard deviation was used to present quantitative information such as hemoglobin level, serum salt level, number of irrigation fluids, length of operation, and number of red cell transfusions. Chi square was used to examine the TURP syndrome, and the independent "t" test/Mann Whitney test was used to compare the operative time, change

in hemoglobin, and sodium levels. A P-value of less than 0.05 was deemed significant. A p-value of ≤0.05 was regarded as statistically significant. The data's normality was examined using the Shapiro-Wilk test. Prostate size and age were stratified, and post-stratification, their impact on operational time, changes in hemoglobin and salt levels, and Chi square for TURP syndrome were examined using the independent "t" test/Mann Whitney test. A P-value of ≤0.05 was deemed significant.

RESULTS

The study's age range was 40–80 years old, with a mean age of 69.55 ± 7.32 years. Patients in groups A and B had mean ages of 67.45 ± 5.92 and 68.50 ± 7.95 years, respectively. The majority of the 82 patients (83.67%) were in the age range of 61 to 80. The prostate weighed 61.10 ± 9.03 grams on average. According to Table-I, the average prostate size in groups A and B was 62.10 ± 8.82 and 59.94 ± 8.99 grams, respectively.

In our investigation, the bipolar group experienced a drop in hemoglobin (g/dl) of 0.73 ± 0.19 and a mean operative time of 32.49 ± 7.05 minutes and 1.69 ± 0.35 (g/dl) compared to 25.63 ± 5.38 minutes and 0.73 ± 0.19 (g/dl) for the monopolar group (p-value = 0.0001). The bipolar group saw a statistically significant (p = 0.0001) decrease in serum sodium levels (mEq/L) at a significantly lower rate than the monopolar group (3.46 ± 0.74 versus 1.06 ± 0.22 mEq/L), as seen in Table-I. There was no TUR syndrome in the B-TURP group (p = 0.153) but 02 (4.08%) patients in the M-TURP group experienced TUR syndrome in my study.

Table-II displays the stratification of mean hemoglobin decrease by prostate size and age. Table-III displays a stratification of the mean drop in serum sodium by prostate size and age. Table-IV displays the mean operation time stratification by prostate size and age. Table-V displays the stratification of TURP syndrome according to prostate size and age.

TABLE-I

Descriptive statistics (n=98).

	Group A (n=49)	Group B (n=49)	P-Values
	Mean ± SD	Mean ± SD	
Age (years)	67.45 ± 5.92	68.50 ± 7.95	0.460
Prostate size (gm)	62.10 ± 8.82	59.94 ± 8.99	0.233
Decrease in haemoglobin (g/dl)	1.69 ± 0.35	0.73 ± 0.19	0.0001
Decrease in serum sodium levels (mEq/L)	3.46 ± 0.74	1.06 ± 0.22	0.0001
Operative time (min)	32.49 ± 7.05	25.63 ± 5.38	0.0001

TABLE-II

Stratification of mean decrease in haemoglobin with respect to age and size of prostate.

		Group A (n=49)		Group B (n=49)		P-Value
		Decrease in Haemoglobin (g/dl)		Decrease in Haemoglobin (g/dl)		
		Mean	SD	Mean	SD	
Age (years)	40-60	1.74	0.48	0.56	0.11	0.0001
	61-80	1.68	0.33	0.77	0.18	0.0001
Size of prostate (grams)	≤60	1.78	0.44	0.69	0.18	0.0001
	>60	1.60	0.22	0.78	0.19	0.0001

TABLE-III

Stratification of mean decrease in serum sodium with respect to age and size of prostate.

		Group A (n=49)		Group B (n=49)		P-Value
		Decrease in Serum Sodium Levels (mEq/L)		Decrease in Serum Sodium Levels (mEq/L)		
		Mean	SD	Mean	SD	
Age (years)	40-60	3.89	0.42	1.07	0.27	0.0001
	61-80	3.38	0.76	1.06	0.22	0.0001
Size of prostate (grams)	≤60	3.26	0.63	1.06	0.23	0.0001
	>60	3.63	0.80	1.06	0.22	0.0001

TABLE-IV

Stratification of mean operative time with respect to age and size of prostate.

		Group A (n=49)		Group B (n=49)		P-Value
		Operative Time (min)		Operative Time (min)		
		Mean	SD	Mean	SD	
Age (years)	40-60	28.71	5.82	22.11	5.16	0.0001
	61-80	33.12	7.10	26.44	5.16	0.0001
Size of prostate (grams)	≤60	32.70	5.57	25.64	5.57	0.0001
	>60	32.31	8.25	25.61	5.29	0.0001

TABLE-V

Stratification of TURP syndrome with respect to age and size of prostate.

		Group A (n=49)		Group B (n=49)		P-Value
		TURP syndrome		TURP syndrome		
		Yes	No	Yes	No	
Age (years)	40-60	00 (0.0%)	09 (100.0%)	00 (0.0%)	09 (100.0%)	----
	61-80	02 (5.0%)	38 (95.0%)	00 (0.0%)	40 (100.0%)	0.152
Size of prostate (grams)	≤60	01 (4.0%)	24 (96.0%)	00 (0.0%)	25 (100.0%)	0.312
	>60	01 (4.17%)	23 (95.83%)	00 (0.0%)	24 (100.0%)	0.312

DISCUSSION

The conventional M-TURP has been challenged in recent years by novel strategies like the application of B-TURP. In contrast to the circuit utilized in M-TURP, a bipolar generator integrates the active and return electrodes within the device.[9] The most significant benefit is that ordinary saline can be used as the irrigation fluid instead of glycine or conventional distilled water. This lessens the risk of electrolyte imbalances brought on by the irrigation fluid's systemic absorption, which can lead to disorders such TUR syndrome.[10]

The primary clinic-demographic characteristics of the patients in our study were comparable in both groups: mean prostate volume, mean resected weight of prostatic tissue, and patient age. Age, the length of the procedure, the volume of prostate tissue removed, the length of the catheterization, the history of preoperative prostatitis, the kind of anesthetic (general or regional), and the history of preoperative urine retention are some of the variables that affect the outcome of TURP.[11,12] The mean age of onset in our study was 67.45 ± 5.92 years (mean ± standard deviation) for the monopolar group and 68.50 ± 7.95 years (mean ± standard deviation) for the bipolar group, which is consistent with Madduri et al.[13] The behavior that was seen may be connected to the way that BPH usually manifests itself later in life, after the age of sixty.

The mean operating time for the monopolar group in our study was 32.49 ± 7.05 minutes, while the bipolar group's was 25.63 ± 5.38 minutes (p-value = 0.0001). A study indicated that monopolar surgery takes less time since the resection time for the M-TURP group was considerably less than that of the B-TURP group (31.20 vs. 43.10 min) ($P < 0.001$).[14] However, there might have been a lack of familiarity with the technology in the early cases because B-TURP was first made available at our institution. In the latter cases, the surgical time required is comparable. The findings of this study go counter to a number of earlier studies that showed no discernible difference in M-TURP and B-TURP operation times.[15] However, the results of past studies that showed bipolar individuals had substantially longer operating durations than monopolar patients contradict the current study.[16] There are several reasons for the observed trend of longer operating times, such as the 24 French bipolar resectoscope's smaller resection loop diameter, the monopolar resectoscope's larger loop size.[17,18]

Hemoglobin (Hb) levels in the monopolar group significantly decreased, according to our data (p = 0.0001). The B-TURP group saw an average drop in Hb of 1.75 ± 0.77 g/dL, while the M-TURP group saw an average decline of 1.57 ± 0.71 g/dL. This difference was statistically insignificant (p = 0.28), according to Madduri et al.[13] The M-TURP group, on

the other hand, had a much lower Hb level (14.52 to 10.4 mg/dL) than the B-TURP group (14.88 to 13.6 mg/dL), according to Giulianelli et al.[19] Our research revealed that the subsequent drop in hemoglobin was less severe than that of the M-TURP group, despite the fact that the glands operated on utilizing the B-TURP approach were of identical size. The results of several comparative investigations on post-operative hemoglobin loss were mixed; some observed statistically minor hemoglobin loss in M-TURP compared to B-TURP, while others reported statistically substantial hemoglobin loss.[20] Alexander[21] found that B-TURP had a lower blood transfusion rate than M-TURP in the Cochrane Database of Systematic Reviews. Tang's meta-analysis revealed that the benefit of B-TURP in coagulation was statistically significant.[22]

Our results demonstrated that the two groups' overall levels of post-operative hyponatremia were similar. In contrast to B-TURP (1.06 ± 0.22 mEq/L), M-TURP caused a larger drop in sodium levels (3.46 ± 0.74 mEq/L). As a result, two M-TURP subjects experienced TUR syndrome, while the B-TURP group experienced none. Madduri et al. reported that the M-TURP group's serum sodium concentration was considerably lower than that of the B-TURP group ($p = 0.001$).[13] They restated that there was a greater chance of TUR syndrome development in the M-TURP group (relative risk: 0.17). Following the absorption of a greater volume of hypo-osmolar non-sodium irrigation fluid, such as glycine (230 mos), which frequently happens at the conclusion of prostatic adenoma excision, TUR syndrome may develop. Since iso-osmolar non-conductive solutions have low visibility and increased turbidity, they are not appropriate for TURP.[23] Dilutional hyponatremia, hypervolemia, and the harmful effects of glycine and its metabolites are the pathophysiology of TUR syndrome. Research revealed a larger pre-operative prostate gland, a longer resection time, a larger amount of prostatic tissue excision, and a higher incidence of transurethral syndrome in older age groups.[23] The danger of hyponatremia and TUR syndrome in B-TURP is almost completely eliminated when prostatic tissue is removed using an irrigation solution of normal saline.[24] In M-TURP[25], the incidence of TURP syndrome ranged from 3% to 10%, according to Indian studies; B-TURP did not exhibit this condition.[26] These results are comparable to what we found.

The findings might not apply to other patients because the study was non-randomized and all cases were treated in a single facility. Both categories had modest sample sizes. For the benefit of bipolar TURP in the treatment of BPH to be more clearly defined, many patients with long-term follow-up are required.

CONCLUSION

In contrast to monopolar transurethral resection, this study found that hemoglobin, serum sodium levels, and TUR-P syndrome drop less following bipolar transurethral resection of the prostate. Therefore, in order to lower the morbidity of these specific patients, we advise using bipolar diathermy for transurethral resection of the prostate.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. El Saied Hafez MH, El Din Abd El Hamid MH, El Raouf SA, Soaida SM, Marie MM. **Bipolar versus monopolar transurethral prostate resection: Comparison of hemodynamic and biochemical changes.** Egyptian Journal of Anaesthesia [Internet]. 2014 Jan [cited 2023 Oct 22]; 30(1):47-52.
2. Yousef AA, Suliman GA, Elashry OM, Elsharaby MD, Elgamasy AE naser K. **A randomized comparison between three types of irrigating fluids during transurethral resection in benign prostatic hyperplasia.** BMC Anesthesiol [Internet]. 2010 Dec [cited 2023 Oct 22]; 10(1):7.
3. Afandiyev F, Ugurlu O. **Factors predicting the development of urethral stricture after bipolar transurethral resection of the prostate.** Revista da Associação Médica Brasileira. 2022; 68:50-5.
4. Vredeveld T, van Benten E, Beekmans R, Koops MP, Ket JCF, Mollema J, et al. **Reliability and validity of assessment methods available in primary care for bladder outlet obstruction and benign prostatic obstruction in men with lower urinary tract symptoms: A systematic review.** BMJ Open. 2022; 12:562-9.

5. Wante M, Mathai M, Shetty V. **Comparative outcomes of monopolar and bipolar transurethral resection of the prostate: An institutional perspective.** Cureus 2024; 16(8):e67947.
6. Hussain A. **Comparison of outcome of bipolar verses monopolar trans urethral resection of prostate in patients with benign prostatic enlargement.** Pak Postgrad Med J 2025; 36(2):75-79.
7. Imran M, Sheikh MA, Aleem A, Rasool M, Rehman SU, Imran MA. **C-comparison of the outcome of monopolar versus bipolar diathermy use during transurethral resection of prostate.** Biol Clin Sci Res J. 2024; 2024:946.
8. Mamoulakis C, Skolarikos A, Schulze M, Scoffone CM, Rassweiler JJ, Alivizatos G, et al. **Results from an international multicentre double-blind randomized controlled trial on the perioperative efficacy and safety of bipolar vs monopolar transurethral resection of the prostate.** BJU International. 2012 Jan; 1 09(2):240-8.
9. Petrillo M, Pesapane F, Fumarola EM. **State of the art of prostatic arterial embolization for benign prostatic hyperplasia.** Gland Surg. 2018; 7:188-99.
10. Boettcher S, Brandt AS, Roth S, Mathers MJ, Lazica DA. **Urinary retention: benefit of gradual bladder decompression - myth or truth? A randomized controlled trial.** Urol Int. 2013; 91:140-4.
11. Franco JV, Garegnani L, Escobar Liquitay CM, Borofsky M, Dahm P. **Transurethral microwave thermotherapy for benign prostatic hyperplasia: |An updated cochrane review.** World J Mens Health. 2022; 40:127-38.
12. Ottaiano N, Shelton T, Sanekommu G, Benson CR. **Surgical complications in the management of benign prostatic hyperplasia treatment.** Curr Urol Reports. 2022; 1-10.
13. Madduri VK, Bera MK, Pal DK. **Monopolar versus bipolar transurethral resection of prostate for benign prostatic hyperplasia: operative outcomes and surgeon preferences, a real-world scenario.** Urol Ann. 2016, 8:291-6.
14. ElNahas AR, Elshal AM, Laymon M, Nabeeh A, Omar M, ElAssmy A. **Bipolar versus monopolar resection of prostate 60–100ml: A prospective randomized trial.** Urology. 2016; 94:198-203.
15. Panigrahi S, Pattajoshi AS, Mahapatra SK. **Monopolar vs. Bipolar trans urethral resection of prostrate (TURP) - a comparative outcome analysis in benign prostatic hyperplasia - a single centre experience in western Odisha.** J Evid Based Med Healthc. 2021; 8(31):2875-79.
16. Khalef JA, Essa AH. **Bipolar vs Monopolar transurethral resection of the prostate in Iraqi patients: A prospective study.** Grand J Urol. 2023; 3(2):38-41.
17. Zubair A, Davis S, Balogun DI, Nwokeocha E, Chiedozie CA, Jesuyajolu D. **A scoping review of the management of benign prostate hyperplasia in Africa.** Cureus. 2022; 14:311-5.
18. Sinha MM, Pietropaolo A, Hameed BMZ, Gauhar V, Somani BK. **Outcomes of bipolar TURP compared to monopolar TURP: A comprehensive literature review.** Turk J Urol. 2022; 48:1-10.
19. Giulianelli R, Albanesi L, Attisani F. **Comparative randomized study on the efficaciousness of endoscopic bipolar prostate resection versus monopolar resection technique.** 3 year follow-up. Arch Ital Urol Androl. 2013; 85:86-91.
20. Ramadan A, Mohammed S, Shabayek M. **Short term surgical outcomes after Monopolar- versus Bipolar Transurethral Resection of the Prostate.** QJM: An International Journal of Medicine [Internet]. 2021 Oct 1 [cited 2023 Jul 6]; 114(Supplement_1):hcab110.003.
21. Alexander CE, Scullion MMF, Omar MI, Yuan Y, Mamoulakis C, N'Dow JMO, et al. **Reprint – Bipolar vs. monopolar transurethral resection of the prostate for lower urinary tract symptoms secondary to benign prostatic obstruction: A Cochrane review.** Can Urol Assoc J [Internet]. 2020 Dec [cited 2022 Jul 6]; 14(12):423-30.
22. Tang Y, Li J, Pu C, Bai Y, Yuan H, Wei Q, et al. **Bipolar transurethral resection versus monopolar transurethral resection for benign prostatic hypertrophy: A systematic review and meta-analysis.** Journal of Endourology. 2014; 28(9):1107-14.
23. Regmi P, Basnet RB, Subedi DD, Shah JN. **Incidence and outcome of transurethral resection of prostate syndrome at a tertiary care hospital: Incidence and outcome of TURP.** Journal of Patan Academy of Health Sciences. 2023; 10(1):11-8.
24. Fagerström T, Nyman CR, Hahn RG. **Bipolar transurethral resection of the prostate causes less bleeding than the monopolar technique: A single Centre randomized trial of 202 patients: Bipolar turp causes less bleeding than the monopolar technique.** BJU International [Internet]. 2010 Jun [cited 2023 Jul 8]; 105(11):1560-4.
25. Thapa N, Acharya GB, Poudel A, Neupane A, Mishra S. **Bipolar versus Monopolar transurethral resection of prostate in treatment of benign prostatic enlargement.** Birat Journal of Health Sciences [Internet]. 2021 Dec 31 [cited 2022 Jul 6]; 6(3):1647-51.
26. Shrestha S, Maskey P, Shah JN. **Outcome of bipolar transurethral resection in benign enlargement of prostate: A retrospective analysis.** J General Prac Emerg Med Nepal. 2021; 8(11):32-6.

AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Mudassar Saeed Pansota:** Conception, design, drafting.
2	**Muhammad Shahzad Saleem:** Critical revision.
3	**Hafiz Muhammad Tariq:** Data analysis.
4	**Muhammad Ajmal Malik:** Acquisition of data.
5	**Mumtaz Rasool:** Data entry.