A MULTICENTER STUDY OF BENIGN PROSTATIC HYPERPLASIA PATIENTS UNDERGOING TRANSURETHRAL RESECTION OF THE PROSTATE IN INDONESIA: A DESCRIPTIVE ANALYSIS

[1]Besut Daryanto, [1]Kurnia Penta Seputra, [1]Paksi Satyagraha, [1]Taufiq Nur Budaya, [1]Fauzan Kurniawan Dhani, [2]Deddy Rasyidan Yulizar, [3]Marta Hendry, [4]Andrie Rhomdhon, [5]Yudi Ambeng, [6]Ryan Akhmad Adhi.

[1] Department of Urology, Faculty of Medicine/University of Brawijaya, Saiful Anwar General Hospital, Malang.
[2] Department of Surgery, Faculty of Medicine/University of Lambung Mangkurat, Ulin General Hospital, Banjarmasin.
[3] Department of Surgery, Faculty of Medicine/University of Sriwijaya, Moh.Hoesin Hospital, Palembang.
[4] Department of Surgery, Kanjuruhan General Hospital, Kepanjen.
[5] Department of Surgery, Faculty of Medicine/University of Palangkaraya, Doris Sylvanus Hospital, Palangkaraya.
[6] Department of Surgery, Iskak General Hospital, TulungAgung.

ABSTRACT

Objective: *The study aims to provide a detailed understanding of the patient demographics and clinical features associated with TURP procedures in several tertiary hospital in Indonesia.* ***Material & Methods:*** *This study is a descriptive cross-sectional study conducted at four provinces in Indonesia. Patient data were collected from January 2021 to December 2023, including all patients diagnosed with BPH and who underwent TURP. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 28.0 (SPSS Inc., Chicago, Illinois, USA).* ***Results:*** *A total of 812 patients met the inclusion criteria for the study. The highest number of patients undergoing TURP (Transurethral Resection of Prostate) was at Saiful Anwar General Hospital, with 287 patients. The average prostate volume across all patients was 57.6±20.6 ml with an IPP (Intravesical Prostatic Protrusion) of 13.0±5.2 ml. Diabetes Mellitus was the most common comorbidity among the patients, affecting 271 patients (33.3%). Urinary retention was the most frequent reason for patients undergoing TURP, affecting 664 patients (81.7%), followed by bladder stones, which affected 58 patients (7.1%).* ***Conclusion:*** *Advanced age and a history of smoking are the primary clinical features observed in BPH patients undergoing TURP in Indonesia. Additionally, urinary retention has been identified as the main indication for TURP procedures in these patients.*

Keywords: *TURP, BPH, IPP.*

ABSTRAK

Tujuan: *Penelitian ini bertujuan untuk memberikan pemahaman rinci mengenai demografi pasien dan gambaran klinis terkait prosedur TURP di beberapa rumah sakit tersier di Indonesia.* ***Bahan & Cara:*** *Penelitian ini merupakan penelitian deskriptif cross-sectional yang dilakukan di empat provinsi di Indonesia. Data pasien dikumpulkan pada Januari 2021 hingga Desember 2023, termasuk seluruh pasien yang terdiagnosis BPH dan menjalani TURP. Data dianalisis menggunakan Statistical Package for Social Sciences (SPSS) versi 28.0 (SPSS Inc., Chicago, Illinois, USA).* ***Hasil:*** *Sebanyak 812 pasien memenuhi kriteria inklusi penelitian. Jumlah pasien yang menjalani TURP (Reseksi Transurethral Prostat) terbanyak terdapat di RSUP Saiful Anwar sebanyak 287 pasien. Volume prostat rata-rata pada semua pasien adalah 57.6±20.6 ml dengan IPP (Intravesical Prostatic Protrusion) 13.0±5.2 ml. Diabetes Mellitus merupakan penyakit penyerta yang paling banyak diderita pasien, yaitu sebanyak 271 pasien (33.3%). Retensi urin merupakan penyebab paling umum pada pasien yang menjalani TURP, yaitu sebanyak 664 pasien (81.7%), diikuti oleh batu kandung kemih, sebanyak 58 pasien (7.1%).* ***Simpulan:*** *Usia lanjut dan riwayat merokok merupakan gambaran klinis utama yang diamati pada pasien BPH yang menjalani TURP di Indonesia. Selain itu, retensi urin telah diidentifikasi sebagai indikasi utama prosedur TURP pada pasien ini.*

Kata kunci: *TURP, BPH, IPP.*

Correspondence: Besut Daryanto; c/o: Department of Urology, Faculty of Medicine/University of Brawijaya, Saiful Anwar GeneralHospital, Jl. Jaksa Agung Suprapto No.2, Klojen, Kec. Klojen, Malang, Jawa Timur 65112, Indonesia. Phone: +6282233678283.Fax: +62341333030. Email: urobes.fk@ub.ac.id

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a histological diagnosis defined by the abnormal proliferation of smooth muscle and epithelial cells in prostate tissue. BPH is common in older men, with an incidence of 80% in men older than 70 years.[1] BPH is the second most common disease found in urology clinics in Indonesia after urinary tract stones.[2]

The treatment options for BPH with lower urinary tract symptoms (LUTS) encompass watchful waiting, pharmacotherapy, and surgical intervention. Treatment choice is primarily determined by the severity of the condition. The introduction of alpha-blockers and 5-alpha reductase inhibitors has established drug therapy as the first-line treatment for BPH. However, concerns exist that pharmacotherapy might delay the appropriate timing for surgical intervention, potentially allowing BPH to progress, and diminishing the perceived importance of surgical options. Open surgery for BPH has become rare due to its association with larger wounds and a higher complication rate compared to transurethral surgery.[3] Currently, the gold standard for surgical treatment of BPH is transurethral resection of the prostate (TURP).[4] Surgical treatment for BPH can also be performed using various types of lasers, including holmium, green, and thulium lasers.[3] However, not all hospital in Indonesia are equipped with these modalities.

OBJECTIVE

The study aims to provide a detailed understanding of the patient demographics and clinical features associated with TURP procedures in several tertiary hospital in Indonesia.

MATERIAL &METHODS

This study is a cross-sectional descriptive study conducted at four provinces consist of six referral hospitals in Indonesia namely, Saiful Anwar General Hospital, Moh Hoesin Palembang General Hospital, Ulin Banjarmasin General Hospital, Doris Sylvanus Palangkaraya General Hospital, Kanjuruhan Kepanjen General Hospital, and Iskak Tulung Agung General Hospital. Patient data were collected from January 2021 to December 2023, including all patients diagnosed with BPH and who underwent TURP.

The baseline characteristics of this study include age, prostate volume, intraprostatic protrusion (IPP), comorbidities, medication history, and surgical indications. The results are presented descriptively in frequency distribution tables. The mean and standard deviation are shown for numeric variables. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 28.0 (SPSS Inc., Chicago, Illinois, USA).

Table 1. Characteristics Study.

	Saiful Anwar (n:287)	Kanjuruhan (n:115)	Iskak (n:136)	Ulin (n:68)	Moh Hoesin (n:112)	Doris Sylvanus (n:94)	Total (n:812)
Age (year), mean±s.d	67.9±8.8	67,8±8,2	68.3±8.0	67.7±8.1	67.8±7.3	69.5±7.5	68.0±8.3
Prostate Volume (ml), mean±s.d	60.6±30.7	54.9±9.3	56.9±11.3	55.6±9.8	58±11.7	50.2±11.9	57.6±20.6
Intraprostatic Protrusion (mm), mean±s.d	16±7.1	12.0±1.5	11.3±2.3	12.1±1.6	11±2.5	11±2.5	13.0±5.2
Hypertension, n (%)	34 (11)	8(6.2)	13(11.9)	6 (8.8)	34 (30)	30 (31.9)	91(11.2)
Diabetes Mellitus, n (%)	96 (33)	3(2.6)	51(37.5)	4 (5.8)	5 (4)	8 (8.5)	271(33.3)
Smoking History, n (%)	108 (37)	5(4.3)	56(41.2)	26 (38)	12 (10.7)	8 (8.5)	311(38.3)
Recurrent UTI	11 (4)	1(0.8)	4(2.9)	1 (1.4)	0 (0)	3 (3.2)	22(2.7)
Bladder Stone, n (%)	20 (6.9)	10(8.6)	3(4.2)	0 (0)	2 (1.7)	1 (1)	58(7.1)
Acute Urinary Retention, n (%)	214 (74.5)	95(82.6)	112(86.5)	95(82.6)	96 (85.7)	85 (90.4)	664(81.7)
Inguinal Hernia, n (%)	5 (1.7)	3(2.6)	1(0.73)	1 (1.4)	2 (1.7)	1 (1)	15(1.8)
Haemorrhoid, n (%)	5 (1.7)	3(2.6)	3(2.2)	0 (0)	0 (0)	0 (0)	10(1.2)
Medication History							
Alfa Blocker	41 (14.2)	19(16.5)	18(13.2)	19 (27.9)	1 (0.8)	4 (4)	115(14.1)
Combination Therapy	18 (6.7)	5(4.3)	11(8.0)	5 (7.3)	1 (0.8)	17 (18)	51(6.2)

RESULTS

A total of 812 patients met the inclusion criteria for the study. The hospital with the highest number of patients undergoing TURP was Saiful Anwar General Hospital, with 287 patients, followed by Iskak Tulung Agung General Hospital with 136 patients, and Kanjuruhan Kepanjen General Hospital with 115 patients (Table 1). The average prostate volume across all patients was 57.6±20.6 ml with an IPP (Intravesical Prostatic Protrusion) of 13.0±5.2 ml. The hospital with the largest average prostate volume undergoing TURP was Saiful Anwar General Hospital, with an average volume of 60.6±30.7 ml, followed by Moh Hoesin Palembang General Hospital with 58±11.7 ml.

Diabetes Mellitus was the most common comorbidity among the patients, affecting 271 patients (33.3%), followed by Hypertension, which affected 91 patients (11.2%). Additionally, 311 patients (38.3%) had a history of smoking. The use of alpha-blocker medication had a higher prevalence compared to combination therapy with alpha-blockers and 5-ARIs, with 115 patients (14.1%) on alpha-blockers and 51 patients (6.2%) on combination therapy, respectively. Among the urological complications associated with BPH, urinary retention was the most frequent reason for patients undergoing TURP, affecting 664 patients (81.7%), followed by bladder stones, which affected 58 patients (7.1%).

DISCUSSION

Benign prostatic hyperplasia is one of the most common diseases in ageing men with increasing incidence with age. Thirty to forty percent of men have BPH by the time they reach their fourth decade of life, and the frequency rises almost linearly to seventy to eighty percent in older adults.[5] Men 65 to 74 years old worldwide carried the highest absolute burden of benign prostatic hyperplasia, making up 42% of all cases among men 40 years of age and older that were prevalent.[6]

From the six hospitals that our research was conducted in (one in Sumatra, two in Kalimantan and three in the Java island), we obtained the average age of BPH patient to be 68 years old. This finding supports the prevalence data of BPH globally. A lot of it has to do with several risk factors that the aging male population share such as obesity and glycaemic levels.[7] Our research found that the mean prostate volume of the patients with BPH is around 57.6 ml with a standard deviation of 20.6 ml. A study conducted in Pakistan showed that prostate volume has clinical effects related to the pathologies of the prostate. Prostates tend to enlarge around 3.5% per year in the transition zone which is usually where BPH tends to start although it can occupy most of the gland. The study showed that people in the age range of 60-70 years old have the highest mean prostate volume.[8] A research done in Indonesia showed that people with a prostate volume of more than 50 ml are the ones who undergo TURP the most. [2]

This study shows that IPP is in fact a risk factor for BPH patient to undergo TURP. The morphological change in IPP is distinct from the types (median lobe, trilobular and median bar) due to the occupancy of the bladder space at a measurable capacity. IPP may make voiding more difficult in patients with BPH.[9] A study conducted in Padang, Indonesia, showed that people different grades of severity for IPP do not show significant difference in International Prostate Symptom Score (IPSS). Even then, there is a significant difference of IPSS value after medical treatments of BPH in respect to the severity of IPP. People with a more severe IPP tend to experience a lesser decrease in IPSS compared to those with a lighter degree of IPP with medical treatment.[10] The Ikatan Ahi Urologi Indonesia (IAUI) stated that a surgical treatment is a relative indication to patients of BPH with little to no improvement with medical treatments.[11] Severe LUTS, which may happen in patients with severe IPP, is an indication for surgery.[10] Men with IPP > 10 mm were shown to respond poorly to alpha adrenoreceptor antagonist medication and were more likely to need prostate surgery.[9,12]

Patients with diabetes have a significantly increased IPSS value compared to those with none. State of hyperglycaemia may induce the increase of free calcium ions in smooth muscle in neuronal cell solute and increase sympathetic nerve activity. Other than that, the increased levels of insulin and insulin-like growth factor receptor-1 may increase the risk of BPH.[13] According to a Nigerian study, the average prostate volume in diabetics is 61.01 milliliters.[14] IAUI and the European Association of Urology (EAU) state that TURP is the gold standard treatment for patients whose prostate volume is between 30 and 80 ml. It is also effective in these patients' cases.[12,15] Of the BPH patients who had TURP procedures in this study, 271 (33.3%) had diabetes. Furthermore, aresearch by Lin et al. found that

patients with diabetes mellitus were more likely to experience urinary retention after TURP and needed continuous medication, especially antimuscarinics three months after surgery and alpha-blockers three months after surgery.[16]

Over the years, there has been ongoing controversy regarding the impact of smoking as a risk factor for the development of BPH. Some studies suggest that smoking has protective benefits, while others indicate it may exacerbate the condition.[17] Nicotine is believed to increase the activity of the sympathetic nervous system, which can lead to urinary retention by elevating the tone of the smooth muscles in the bladder. Additionally, vascular damage caused by hypertension contributes to increased resistance, further compounded by the enlargement of the prostate gland.[18] Other research indicates that smoking reduces testosterone levels, thereby increasing the risk of developing BPH.[19] Our research found that 311 participants, or 38.3%, with a history of smoking and BPH underwent TURP.

According to the American Urological Association (AUA), complications of BPH may include acute urinary retension (incidence of 6.8 episodes per 1,000 patient years overall), chronic urinary retention, renal insufficiency/failure, recurrent UTIs, bladder stones and gross hematuria.Indications for TURP, refractory urinary retention secondary to BPH, recurrent urinary tract infections, recurrent bladder stones, gross hematuria due to BPH and LUTS/ BPH refractory to or unwilling to use other therapies.[20] Our data showed most of the patient underwent TURP because acute urinary retention with 81.7%.

Failure of medical therapy is one of the indications of patients to undergo TURP, which is evident from a study done in Indonesia where failure of medication is one of the factors of BPH patients to undergo TURP.[2] Common medication for BPH includes alpha-1 blocker and 5-alpha reductase inhibitor. Alpha-1 inhibitor works by inhibiting smooth muscle contraction which decreases bladder neck resistance. This group includes terazosin and tamsulosin 5-alpha reductase inhibitor has a mechanism of inducing apoptosis of prostate epithelial cell. This class includes finasteride and dutasteride.[12] TURP is one surgical method to manage BPH.[12,15,21] IAUI made a mention on how surgical treatment is an option for patients of BPH who had no improvement with medical treatment.[12]

These findings provide valuable insights into the demographic and clinical characteristics of BPH patients undergoing TURP in Indonesia. They also highlight the importance of addressing comorbid conditions and risk factors to improve patient outcomes. Further studies could explore the long-term outcomes of TURP in this patient population and assess the impact of different management strategies on the quality of life and disease progression.

CONCLUSION

In conclusion, advanced age and a history of smoking are the primary clinical features observed in BPH patients undergoing TURP in Indonesia. Additionally, urinary retention has been identified as the main indication for TURP procedures in these patients.

REFERENCES

1. Egan K. B. The Epidemiology of Benign Prostatic Hyperplasia Associated with Lower Urinary Tract Symptoms: Prevalence and Incident Rates. The Urologic Clinics of North America. 2016; 43(3): 289–297.
2. Prasetyo, Z.A., Budaya, T.N., &Daryanto, B. Characteristics of Benign Prostatic Hyperplasia (BPH) Patients Undergoing Transurethral Resection of the Prostate (TURP). Jurnal Kedokteran Brawijaya. 2021; 31(4).
3. Peng, Z. F., Zhou, J., Song, P., Yang, L. C., Yang, B., Ren, Z. J., Wang, L. C., Wei, Q., & Dong, Q. Retrospective analysis of the changes in the surgical treatment of benign prostatic hyperplasia during an 11-year period: a single-center experience. Asian Journal of Andrology. 2021; 23(3): 294–299.
4. Daryanto, B., Budaya, T.N., &Meiyanto, J.D. Short-Term Complications of Transurethral Resection of The Prostate Performed By Urology Resident In Educational Hospital: Characteristics And Determinant Factors. Indonesian Journal of Urology. 2024; 31(1): 30-33.
5. Madersbacher, S., Sampson, N., &Culig, Z. Pathophysiology of Benign Prostatic Hyperplasia and Benign Prostatic Enlargement: A Mini-Review. Gerontology. 2019; 65(5): 458–464.
6. GBD 2019 Benign Prostatic Hyperplasia Collaborators. The global, regional, and national burden of benign prostatic hyperplasia in 204 countries and territories from 2000 to 2019: a systematic analysis for the Global Burden of Disease Study 2019. The lancet. Healthy longevity. 2022; 3(11): e754–e776.
7. Xiong Y, Zhang Y, Li X, Qin F, Yuan J. The prevalence and associated factors of lower urinary tract symptoms suggestive of benign prostatic hyperplasia

in aging males. Aging Male. 2021;23(5):1432–9. 2.
8. Khan A, Shaikh SU, Ali Rabiya, Ahmed SB. Age and Prostatic Volume: The Prognosis for Benign Prostatic Hyperplasia. Pakistan Journal of Medicine and Dentistry. 2023 May 10; 12(2): 23-28.
9. Gandhi J, Weissbart SJ, Kim AN, Joshi G, Kaplan SA, Khan SA. Clinical Considerations for Intravesical Prostatic Protrusion in the Evaluation and Management of Bladder Outlet Obstruction Secondary to Benign Prostatic Hyperplasia. Vol. 12, Current Urology. S. Karger AG; 2018. p. 6–12.
10. Ishak M, Myh E, EriadYunir P, Penulis K, Muhammad Ishak dr. Hubungan Intravesical Prostatic Protrusion (IPP) terhadap Perubahan International Prostate Symptoms Score (IPSS) pada Pasien Benign Prostatic Hyperplasia (BPH) yang Diterapidengan A1-Blocker di Kota Padang. Jurnal Ilmu Bedah Indonesia. 2021; 49.
11. Tjahjodjati, Soebadi DM, Umbas R, Mochtar CA, Daryanto B, Noegroho BS, et al. Panduan Penatalaksanaan Klinis Pembesaran Prostat Jinak. 2021.
12. Putri, F., Fariz, M. Evaluation of the Accuracy of the Use of Intravesical Prostatic Protrusion Degree as the Predictor of Benign Prostatic Hyperplasia Management. Journal of Medical Science. 2024; 18(1): 11-16.
13. Xin C, Fan H, Xie J, Hu J, Sun X, Liu Q. Impact of Diabetes Mellitus on Lower Urinary Tract Symptoms in Benign Prostatic Hyperplasia Patients: A Meta-Analysis. Frontiers in Endocrinology. Frontiers Media S.A. 2022; 12: 741-748.
14. Udoh EA, Usoro AJ, Essiet IU. Association between Diabetes Mellitus and Benign Prostatic Hyperplasia. SAS Journal of Surgery. 2022 Dec 7;8(12):763–7. 8.
15. Cornu JN, Gacci M, Hashim H, Herrmann TRW, Malde S, Netsch C, et al. EAU Guidelines on Non-Neurogenic Male Lower Urinary Tract Symptoms (LUTS). 2024.
16. Lin YH, Hou CP, Chen TH, et al. Is diabetes mellitus associated with clinical outcomes in aging males treated with transurethral resection of prostate for bladder outlet obstruction: implications from Taiwan Nationwide Population-Based Cohort Study. ClinInterv Aging. 2017;12:535-541.
17. Xu, H., Fu, S., Chen, Y., Chen, Q., Gu, M., & Wang, Z. Smoking habits and benign prostatic hyperplasia: A systematic review and meta-analysis of observational studies. Medicine. 2016; 95(32): e4565.
18. Stefanus D, Siregar S. Association of Lower Urinary Tract Symptoms and Benign Prostatic Enlargement in Patients with Hypertension. Majalah Kedokteran Bandung. 2023 Mar 30;55(1).
19. Wang YB, Yang L, Deng YQ, Yan SY, Luo LS, Chen P, et al. Causal relationship between obesity, lifestyle factors and risk of benign prostatic hyperplasia: a univariable and multivariable Mendelian randomization study. J Transl Med. 2022 Dec 1;20(1).
20. Lerner LB, Barry MJ, Anurag ;, Das K, Gandhi MC, Kaplan SA, et al. Management of Lower Urinary Tract Symptoms Attributed to Benign Prostatic Hyperplasia: AUA Guideline. 2023.
21. Fogaing C, Alsulihem A, Campeau L, Corcos J. Is early surgical treatment for benign prostatic hyperplasia preferable to prolonged medical therapy: Pros and cons. Medicina. 2021; 57: 368.