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A short-term treatment outcome and its associated factors of transvesical prostatectomy among patients admitted with Benign Prostatic Hyperplasia at Wolaita Sodo University Comprehensive Specialized Hospital, Southern Ethiopia

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Abstract

Benign prostatic hyperplasia is the commonest cause of urinary problems in elderly males, affecting their quality of life. Modalities of treatment include watchful waiting, medical treatment, surgical treatment like transurethral resection, and open prostatectomy. But the outcome and associated factors of prostatectomy among patients with benign prostatic hyperplasia at Wolaita Sodo University Comprehensive Specialized Hospital were not studied. To assess the short-term treatment outcomes and associated factors of transvesical prostatectomy (TVP) among patients admitted with benign prostatic hyperplasia (BPH) in Wolaita Sodo University Comprehensive Specialized Hospital. A facility-based cross-sectional study was conducted from October 1, 2022, to October 30, 2022, among 316 patients diagnosed with benign prostatic hyperplasia. The data were collected by reviewing medical records, entered into EpiData version 3.1, and analyzed using SPSS version 25. Descriptive statistics were used to describe the data. A bi-variable and multivariable logistic regression analysis was used to identify factors associated with the outcome of transvesical prostatectomy. Adjusted odd ratio (AOR) (with a 95% confidence interval) was used to report association, and significance was declared at a P-value <0.05. Ninety-six percent (96.2%) of patients presented with severe symptoms, and 83.9% had pre-operation catheterization. The overall complication rate was 42.4%, and surgical site infection was 38.3%. Duration of symptoms [AOR = 9.05, 95% CI (2.16-37.88)] and type of skin incision [AOR = 18.98, 95% CI: 1.67–208.45] were significantly associated with complications of TVP. The complications seen in this study are higher than in other studies in Ethiopia and some other African countries. Duration of symptoms and type of skin incision were factors significantly associated with outcome. Improving community

awareness about the nature of the disease and the importance of follow-up both before and after surgery is needed to minimize complications.

Keywords: Benign prostate hyperplasia, Transvesical prostatectomy, Post-op complications

Introduction

Benign Prostatic hyperplasia (BPH) is the commonest cause of urinary problems in elderly males, affecting their quality of life (Park et al., 2021). Urinary retention due to prostatic disease is a major geriatric problem. Modalities of treatment include watchful waiting, medical treatment like alpha blockers and finasteride for mild symptoms, and surgical treatment like open prostatectomy (OP) (Gupta et al., 2015). Transvesical prostatectomy (TVP) is a popular type of OP; however, the application of TVP for large prostates has been progressively decreasing over the years with the advent of minimally invasive techniques, including monopolar and bipolar transurethral resection of the prostate (TURP), photoselective vaporization techniques, and different laser therapies (Ou et al., 2013). Currently, TURP is considered the reference or standard treatment for prostates less than 70 to 80 g (Varkarakis et al., 2004).

However, open prostatectomy is still being performed for operations on the prostates that are candidates for TURP in many developing countries, including Ethiopia, due to the scarcity of endoscopic equipment and trained endoscopic personnel (Salako et al., 2016). Open transvesical prostatectomy is the most common urosurgical procedure done at Wolaita Sodo University Comprehensive Specialized Hospital (WSUCSH), but no study was conducted to assess outcomes and associated factors related to TVP. Therefore, this study assessed the short-term outcomes of open TVP among patients admitted with BPH in WSUCSP, southern Ethiopia.

Materials and methods

Study area and period

This study was conducted at Wolaita Sodo University Comprehensive Specialized Hospital (WSUCSH). Wolaita Sodo University Comprehensive Specialized Hospital is located in Wolaita Sodo Town, 332 km south of Addis Ababa, the capital city of Ethiopia. The hospital was established in 1927. Now it is serving as a teaching hospital for both undergraduate and postgraduate studies in addition to its tertiary clinical service for more than 3 million people in the catchment area. It has 61 surgical beds out of a total of 350 beds for its inpatient service

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(WSUCSH, 2021). The data collection was conducted from October 1, 2022, to October 30, 2022.

Study design

Institution-Based Retrospective Cohort Study

Source population

The source population was the medical records of all male patients who were admitted to the surgical ward with a diagnosis of benign prostatic hyperplasia from January 1, 2019 to September 30, 2022.

Study population

The study population consisted of the medical records of all male patients with BPH who had undergone TVP during the study period.

Operational definition

Bladder outlet obstruction: having signs and symptoms like frequency, urgency, incontinence, hesitancy, feeling of incomplete emptying, drippling, intermittency, enlarged prostate, palpable tender suprapubic mass, and residual urine >250 ml on abdominopelvic ultrasound.

Transvesical prostatectomy: resection of the prostate through the bladder cavity.

Post-operative complications: any negative outcome as perceived either by the surgeon or by the patient.

Short-term outcome: consequences of the operation (either good or bad) within 30 days. A good outcome (uncomplicated) is without any complications, and a bad outcome (complicated) is the presence of one or more complications, such as surgical site infections, bladder injury, suprapubic leakage, urinary tract infection, peritoneal injury, bladder injury, or clot retention.

Late complications: complications that happen or persist after 30 days of TVP

Clot retention: failure to void postoperatively due to obstruction by a blood clot.

Study variables

Dependent variable: outcomes

Independent variables: age of patients, prostate volume, comorbidity, type of anaesthesia, duration of surgery, duration of pre-op catheterization. Pre-operative urinary tract infection, prophylactic antibiotics, indications for surgery, duration of lower urinary tract symptoms, type of skin incision, and duration of hospital stay.

Sampling technique and sample size determination

Sample size was calculated using the formula $n = Z^2P\ (1\text{-}P)/d^{2,}$ where n = the sample size, d = the desired level of precision, p = the proportion of outcomes of patients operated for TVP previously, which was 24.9% (Asefa, 2021), and the Z-value is from the Z-table. Setting the confidence level at 95% with +/-5% precision gives us a Z value of 1.96 per the normal table. $N = (1.96)^2.0.249(1\text{-}0.249)/ (0.05)^2$. Adding 10% non-response rate, the total sample size is 316.

Sampling technique

A systematic sampling technique was used.

Data source and data collection procedures

Data were collected from the operation room (OR) logbook, patients' medical records, and HMIS logbook from October 1–30, 2022. Check lists were prepared in English. Five residents (3 surgical and 2 GYN/OB residents) and data collectors were recruited. One-day training was given to them, focusing on the objective of the study, the value of collecting the actual data, and the ethical manner during chart reviewing. The checklist was discussed in detail, going through every question, and clarification was provided. Socio-demographic data, history and physical examination, risk factors, investigation, and intra-operative findings have been collected from the records of each patient in the operation theatre logbook of general surgery and patients' medical records using a pretested data collection sheet developed by the principal investigator (PI). The principal investigator was continuously supervising the data collectors and taking immediate measures in case of any confusion.

Data quality control

One-day training was given to data collectors, focusing on the objective of the study, the value of collecting the actual data, and the ethical manner during chart reviewing. The data collection

format was checked for its completeness, and any gaps identified were corrected immediately. The principal investigator was supervising the content and quality of data collected daily, and improperly collected data were rechecked after communicating personally with the data collectors. A pretest was done on 5% of records before the actual data collection started.

Data analysis and interpretation

The collected data were cleaned, entered, and processed by Epi Data version 3.1 and exported to SPSS version 25 for analysis. Descriptive statistics using frequency, percentages, tables, and figures were used to describe the magnitudes. Multicollinearity was checked by using the variance inflation factor (VIF) and tolerance. The VIF values were <2.1 in all variables. Binary logistic regression was done, and variables with a p-value of <0.25 were selected for multivariable logistic regression analysis to identify factors significantly associated with the outcome of TVP. An odds ratio with a 95% CI and P-value was used to check both the presence and strength of the association between variables. Significance was declared at a P-value < 0.05. The model's fitness was checked using the Hosmer-Lemeshow goodness of fitness test, and the result was 0.259, which showed the model was well-fitted. Finally, tables, figures, and text are used to present the data. Any degree of absence was excluded.

Ethical considerations

Ethical clearance was obtained from the Institutional Review Board (IRB) of Woliata Sodo University Health Sciences and Medicine College. Before data collection was started, an official letter was delivered to the WSUCSH chief research and community directorate on behalf of the school of medicine to get permission for the study. The chief research and community directorate wrote a letter to the hospital medical director. A brief explanation was given to the hospital clinical director concerning the purpose of the study and the procedures used to collect the data. After getting permission, patients’s charts that fulfilled the criteria were selected. Confidentiality of the collected data was kept, and names of the patients were not included during data collection.

Results

Socio-demographic features

In this study, records of 316 male patients who had undergone transvesical prostatectomy at Wolaita Sodo University Comprehensive and specialized hospital from January 1, 2019 to September 30, 2022 were reviewed, and the study showed a mean and median age of 61.6 and 62.2 years, respectively, with a range of 45–80 years. The commonest age range managed for BPH in this study was 60–69 years, comprising 40.2% (127) followed by the age range 50–59 years, about 30.3%. The majority of the patients are from rural areas and are illiterate, which accounts for about 85.1% and 82.6%, respectively.

Clinical presentations and comorbidities

Frequency of micturition, hesitancy, nocturia, and urgency were the most common presenting symptoms observed in 91.1%, 86.1%, 82.3%, and 72.7%, respectively. The majority of patients presented with severe lower urinary tract symptoms, which account for 96.2%. The patients presented in the range of 1-6 months were 50.1%, followed by those presented within 1 month with 29.1%. The mean duration of symptoms at presentation was 4.1 months. The study shows 9.5% of patients had associated comorbidities. Among these, hypertension was the highest (4.1%).

Pre-operative conditions of the patients

About eighty-four percent (83.9%) of patients had an indwelling catheter before the operation. The commonest indication of pre-operation catheterization was acute urinary retention, which was observed in 94.6% of patients. Urinary tract infection before operation was observed in 20.9%; all of them were treated with oral antibiotics. All patients had ultrasounds, showing a common average prostate size of 50–80 ml in 47.5%, followed by >80 ml in 43.4% of patients. The mean and median prostate size was 77.4 ml and 75.8 ml, respectively. Culture was not done for all patients (Table 1).

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Table 1. Pre-operative conditions of patients who underwent TVP in WSUCSH from January 1, 2019–September 30, 2022 (n = 316)

Variables	Category	Outcome of TVP		Total
		Complicated	Uncomplicated	
Pre-operative catheterization	NO	25 (7.9%)	26 (8.2%)	51 (16.1%)
	Yes	109 (34.5%)	156 (49.4%)	265 (83.9%)
Indications of preop catheterization	Acute retention	107 (40.4%)	163 (57.7%)	260 (98.1%)
	Obstructive uropathy	2 (0.8%)	3 (1.1%)	5 (1.9%)
Duration of preop catheterization	<1 month	52 (19.6%)	92 (34.7%)	144 (54.3%)
	1-3 months	43 (16.2%)	54 (20.4%)	97 (36.6%)
	3-6 months	19 (7.1%)	4 (1.5%)	23 (8.7%)
	>6 months	1 (0.4%)	0 (0.0%)	1 (0.4%)
Prostate size	<50 CC	19 (6.0%)	10 (3.2%)	29 (9.2%)
	50-80 CC	49 (15.5%)	101 (32.0%)	150 (47.5%)
	>80 CC	66 (20.9%)	71 (22.5%)	137 (43.4%)
Secondary changes in BOO	Hydronephrosis	11 (3.5%)	13 (4.1%)	24 (7.6%)
	Trabeculations	7 (2.2%)	3 (0.9%)	10 (3.2%)
	Diverticula	5 (1.6%)	8 (2.5%)	13 (4.1%)
Preop creatinine	<1.2mg/dl	128 (40.5%)	182 (57.6%)	310 (98.1%)
	1.2-2 mg/dl	6 (1.9%)	0 (0.0%)	6 (1.9%)
	>2mg/dl	0 (0.0%)	0 (0.0%)	0 (0.0%)
Preop UTI	No	72 (22.8%)	178 (56.3%)	250 (79.1%)
	Yes	62 (19.6%)	4 (1.2%)	66 (20.9%)
Preop hospital stay	<1 week	109 (34.5%)	180 (57.0%)	289 (91.5%)
	1-2 weeks	22 (7.0%)	2 (0.6%)	24 (7.6%)
	2-4 weeks	3 (0.9%)	0%	3 (0.9%)
postop hospital stay	<1 week	52 (16.5%)	179 (56.6%)	231 (73.1%)
	1-4 weeks	82 (25.9%)	3 (0.9%)	85 (26.9%)

Intra-operative and immediate post-operative conditions of the patients

The commonest indication of TVP was some symptoms (95. 9%). Prostatectomy was done under spinal anaesthesia in 310 (98.1%) patients, and general anaesthesia was used in the rest (1.9%). The approach of incision was Pfannenstiel in 95.3% of patients. The duration of surgery was >90 minutes in most cases (84.5%). Retropubic drain was kept in all patients and removed on the 3rd post-op days. Catheter was removed after 5-7 days of operation in 72.5% of patients. A re-

operation was done for three patients for clot evacuation. The transfusion rate was 2.2% (Table 2).

Table 2. Intra-operative procedures of participants who underwent TVP in WSUCSH from January 1, 2019–September 30, 2022 (n = 316)

		Outcome of TVP		
Variables	Category	Complicated	Uncomplicated	Total
Indication of TVP	Failed medical Management	1 (0.3%)	0 (0.0%)	1 (0.3%)
	Bothersome symptoms	128 (40.5%)	171 (54.1%)	299 (94.6%)
	AUR	5 (1.6%)	11 (3.5%)	16 (5.0%)
Types of Anaesthesia	Spinal	131 (41.5%)	179 (56.6%)	310 (98.1%)
	General	3 (0.9%)	3 (0.9%)	6 (1.9%)
Type of skin incision	Pfannenstiel	132 (41.8%)	169 (53.5%)	301 (95.3%)
	Midline	2 (0.6%)	13 (4.1%)	15 (4.7%)
Duration of surgery	60-90 minutes	18 (5.7%)	63 (19.9%)	81 (25.6%)
	>90 minutes	116 (36.7%)	119 (37.7%)	235 (74.4%)
Route of catheterization	transurethral only	113 (35.8%)	171 (54.1%)	284 (89.9%)
	suprapubic +transurethral	21 (6.6%)	11 (3.5%)	32 (10.1%)
Size of the catheter	16F	0 (0.0%)	0 (0.0%)	0 (0.0%)
	18F	21 (6.6%)	11 (3.5%)	32 (10.1%)
	24F	113 (35.8%)	171 (54.1%)	284 (89.9%)
Transfusion	No	131 (41.5%)	178 (56.3%)	309 (97.8%)
	Yes	4 (1.3%)	3 (0.9%)	7 (2.2%)
Re-operation	No	131 (41.5%)	182 (57.6%)	313 (99.1%)
	Yes	3 (0.9%)	0 (0.0%)	3 (0.9%)
Duration of bladder irrigation	24hrs	89 (28.2%)	171 (54.1%)	260 (82.3%)
	24-48hrs	38 (12.0%)	10 (3.2%)	48 (15.2%)
	>48hrs	7 (2.2%)	1 (0.3%)	8 (2.5%)
Post-op catheter removal	<5 days	0 (0.0%)	0 (0.0%)	0 (0.0%)
	5-7 days	53 (16.8%)	176 (55.7%)	229 (72.5%)
	>7 days	81 (25.6%)	6 (1.9%)	87 (27.5%)

Magnitude of perioperative complications

Surgical site infection, clot retention, and suprapubic urine leak were the commonest complications encountered in 38.3%, 11.1%, and 5.7%, respectively. There were 1 (0.2%) patient with a bowel injury, 8 (2.8) patients with a peritoneal injury, and 10 (3.2%) patients with a bladder injury intraoperatively. Repairs were done for all with the same operation.

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Postoperatively, the majority of patients had follow-up within 1-3 weeks and reported improved quality of life. One patient died, accounting for a for a mortality rate of 0.3%. The overall postoperative complication rate was 42.4% (Table 3).

Table 3. Magnitude of complications and treatment of patients who underwent TVP in WSUCSH from January 1, 2019 to September 30, 2022 (n = 316)

Variables	Category	Frequency	Percentage (%)
Intraop complication	Bowel/peritoneal injury	9	2.8%
	Bladder injury	10	3.2%
	Hypotension*/Hypertension	18	5.7%
Clot retention	No	281	88.9%
	Yes	35	11.1%
Surgical site infections	No	195	61.7%
	Yes	121	38.3%
Suprapubic leakage	No	298	94.3%
	Yes	18	5.7%
Pneumonia	No	305	96.5%
	Yes	11	3.5%
Incontinence	No	304	96.2%
	Yes	12	3.8%
Miscellaneous	Urinary tract infection	7	2.2%
	Myocardial infarction	1	0.3%
	Epididymorchitis	1	0.3%
Treatment of the complications	No treatment is needed	179	56.6%
	Antibiotics with wound care and irrigation	125	39.6%
	Kegel exercise	9	2.8%
	Reoperation	3	0.9%

Treatment (RX) outcome of patients who have undergone TVP

Majorities (96.2%) of patients presented with severe symptoms, and 83.9% had pre-operation catheterization. Overall good outcome or outcome without complications was 57.6%. The overall complication rate (bad outcome) was 42.4%, and surgical site infection was the most common complication encountered in 38.3% of participants (Table 3).

Factors associated with the RX outcome of TVP

By using binary logistic regression analysis, bivariate analysis was done for all independent variables. Based on assumption criteria, all variables with a p-value less than 0.25 are entered into multivariable binary logistic regression analysis. In the multivariable analysis, duration of symptoms [AOR = 9.05, 95% CI (2.16-37.88)] and type of skin incision [AOR = 18.98, 95% CI (1.67-208.45)] were significantly associated with perioperative complications of TVP. Participants with pre-op catheterization for 3 months, participants with pre-op UTI, and participants with hospital stays of 1–4 weeks were more likely to develop complications compared to their counterparts (Table 4).

Table 4. Multivariate logistic regression analysis of factors associated with the outcome of TVP

Variables	Category	Outcome		COR (95%CI	AOR (95%CI)	P-value
		Complicated/ Bad outcome/	Uncomplicated/Good outcome			
Prostate size (in ml)	<50	19	10		1	
	50-80	49	101	3.916(1.694,9.056)	2.276(0.631,8.202)	0.209
	>80	66	71	2.044(0.886,4.715)	1.566(0.396,6.187)	0.522
Duration of LUTS (in months)	<1	50	42		1	
	1-6	67	92	1.635(0.975,2.742)	3.006(1.139,7.930)	0.026
	>6	17	48	3.361(1.688,6.693)	9.050(2.162,37.886)*	0.003
Duration of the preop catheter (in months)	<1	61	110		1	
	1-3	47	64	2.525(1.768,8.295)	0.273(0.117,0.636)	0.003
	3-6	18	3	1.906(0.570,6.379)	0.073(0.15,0.347) *	0.001
	>6	1	0	0.233(0.044,1.248)	0.114(0.29,0.452)	0.002
Comorbidity	No	109	177		1	
	Yes	25	5	0.123(0.046,0.331)	0.363(0.083,1.588)	0.179
Preop UTI	No	72	178		1	
	Yes	62	4	0.026(0.009,0.074)	0.022(0.006,0.85)*	0.000
Skin incision	Midline	2	13		1	
	Pfannenstiel	132	169	5.077(1.126,22.890)	18.982(1.672,208.45)*	0.002
Hospital stay (in weeks)	<1	78	179		1	
	1-4	56	3	0.011(0.003,0.035)	0.008(0.002,0.034)	0.006

Discussion

Benign prostatic hyperplasia (BPH) is the commonest cause of bladder outlet obstruction (BOO) in ageing men. If untreated, patients could suffer from different associated complications such as

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urinary tract infection, hydronephrosis, and renal failure (Park et al., 2020; Gupta et al., 2015; Ou et al., 2013). This study attempted to assess the short-term surgical outcome of transvesical prostatectomy. The majority of our patients were between 60 and 69 years of age, which is similar to other studies in Ethiopia. Studies from Ethiopia and China have reported the starting age of symptomatic BPH requiring surgery to be in the fifth decade of life (Xiong et al., 2020; Nega et al., 2008).

The overall complication rate in our study was 42.4%, which is similar to the study conducted in Arab (42.3%) (Elshal et al., 2013) and higher than the assessment conducted in Bavaria, Germany (17.3%) (Gratzke et al., 2007), North India (14%) (Bansal et al., 2016), Monrovia (38.7%) (Yunusa et al., 2019), but less than the study conducted in Nigeria (45.3%) (Obi et al., 2023) and Sudan (52.6%) (Elnaim et al., 2017). But no significant postoperative complications were noted using laparoscopic surgery (Al-Aown et al., 2015).

The most common complication in our study was surgical site infection (38.3%), but the study conducted in the USA showed that the most common complication was blood loss, requiring transfusion in approximately 36% of cases (Helfand et al., 2006). This difference may be due to the safety of surgical procedures, the patient's condition, and the operation room. Our study showed that duration of symptoms and types of skin incision were significantly associated with perioperative complications of TVP.

Although benign prostatic hyperplasia is primarily obstructive and obstructive lower urinary tract symptoms (LUTS) are expected to predominate, irrigative symptoms like frequency (91.1%), nocturia (82.3%), and urgency (72.7%) were common in our study, which is similar to the study done at Menilik II Hospital in Ethiopia (Beyene et al., 2021). The majority of patients had a prostate size of 50–80 ml (47.5%) and presented with acute urinary retention (94.6%), unlike results revealed in other studies in which the mean duration of presentation was 2 months, prostate size <50 ml, and acute retention (39%) (Xiong et al., 2020). This difference may be related to health service access, medical care-seeking behaviour, or the selection criteria of study groups. The two most common comorbidities in our study were hypertension (60.9%) and urinary tract infection (20.8%). But the study conducted at Yekatit 12 Hospital in Ethiopia indicated that the UTI was 30.7% (Asefa, 2021). The rate of pre-operative catheterization observed in this study was 83.9%, with a mean duration of 2.8±1.8 months. However, the figure

in the other study was 78% of indwelling catheters before surgery with a mean duration of 6.5 weeks, which is probably associated with the difference in sample size and study setting (Asefa, 2021).

In our study, the commonest indications of surgery were acute urinary symptoms and failed medical management (1.3%). Seife and Deneke (2018) also reported that the indication for surgery was acute urinary retention. It is almost comparable, but differences are related to the availability of medical management and surgeon preference.

The commonest complication identified in this study was surgical site infection (38.3%), followed by clot retention (11.1%) and suprapubic leak (5.7%), whereas a study from India revealed surgical site infection (28%), clot retention (5.4%), and suprapubic leak (16%), and another study in Ethiopia has shown surgical site infection (4%), clot retention (0.4%), and suprapubic leak (0.8%). The re-operation rate in this study (0.9%) for clot evacuation was comparable to that of a study in Ethiopia (0.4%) and lower than that in India (4%) (Xiong et al., 2020; Ceylan et al., 2016). The discrepancy may be related to different study designs, pre-operation catheterization rates, duration, and patient selection. In this study, intraoperative bleeding required transfusion in 7 patients, making the transfusion rate 2.2%, which is comparable to studies in China and Addis Ababa, Ethiopia (Xiong et al., 2020; Seife and Deneke, 2018). The high rate of clot retention in this study (11.1%), unlike the study conducted in Turkey (Ceylan et al., 2016), which reported 6.6% early clot retention, is likely due to the use of only the transurethral route in our case. The study conducted at Yekiti 12 Hospital in Ethiopia reported that complications like urinary tract infection were observed in 30.7% of patients, but in our study, urinary tract infection (UTI) was only. 2.2% (Asefa, 2021). The absence of some complications in this study, like retrograde ejaculation and sexual dysfunction, may be due to the cultural barrier providing such information or poor follow-up, unlike the report by Berhanu, who observed 100% (Yunusa et al., 2019). Overall, post-operative complications were 42.4% and perioperative mortality was 0.3%, contrary to studies in the USA (Süzer et al., 2021) that revealed a postoperative complication rate of 28% and other parts of Ethiopia (24.9%) (18). Perioperative mortality is comparable to both studies. The possible contributing factors for this may be study design (RCT in the USA study), prolonged preop catheter, preop UTI, and a long hospital stay.

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According to reports from China, Nigeria, and other studies in Ethiopia, predictors of favourable outcomes were age, comorbidity, experience of the surgeon, and the presence of preoperative complications (Yisa et al., 2021; Adegun et al., 2015; Nega et al., 2008). However, in this study, the predictors of outcome are the duration of symptoms of LUTS and the type of skin incision. Participants with symptoms of LUTS lasting more than 6 months were 9 times more likely to develop complications than those with <1-month duration, and those with Pfannenstiel incisions were more likely to develop complications than midline incisions. This difference may be justified by a lack of access to health services because the majority of patients in this study were from rural areas, and the setting in which the operations were carried out could also be a possible reason.

In this study, participants with pre-op catheterization of 3 months, participants with pre-op UTI, and participants with hospital stays of 1 to 4 weeks were more likely to develop complications compared to their counterparts. The study conducted by Beyene et al. (2021) also found the duration of post-op catheterization and hospital stay to be significantly associated with complications.

Some studies conducted in developing countries recommend interventions that minimize complications (Ugwumba et al., 2014); discussion with patients regarding the short- and long-term risks and benefits, as well as alternatives, before deciding on a treatment plan should be conducted (Bortnick et al., 2020); and to minimize risk, early screening and intervention are important (Yasein et al., 2017).

Conclusion

Given the limited availability and high costs of minimally invasive procedures like transurethral resection of the prostate, TVP remains the only option for improving the quality of life of elderly men in Ethiopia. The overall complication rate was 42.4%. And the leading complication was surgical site infection (38.3%).This figure is higher than in other studies. The duration of symptoms and types of skin incisions were significantly associated with treatment outcomes. More efforts should be made towards improving community awareness about the nature of the disease and the importance of follow-up both before and after surgery. Minimally invasive techniques like the TURP service should be started because these procedures significantly decrease the rate of complications. However, as it was retrospective, further important variables

potentially affecting outcome and the real causal association may not be ascertained. It was a hospital-based, single-centre study, and the conclusions drawn may not represent society at large.

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Conflicts of interest

The authors assert that they have no competing interests in relation to this research work.

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