

# ERECTILE DYSFUNCTION AFTER TRANSURETHRAL PROSTATE RESECTION (TURP) IN PATIENTS WITH LOWER URINARY TRACT SYMPTOMS AT KOJA HOSPITAL, JAKARTA

<sup>1,2</sup>Maruto Harjanggi, <sup>2</sup>Waluyo Eko Sutarto.

<sup>1</sup> Urology Division, Department of Surgery, Koja Hospital, Jakarta.

<sup>2</sup> Department of Urology, Faculty of Medicine/Universitas Indonesia, Cipto Mangunkusumo General Hospital, Jakarta.

## ABSTRACT

**Objective:** Aim of this study is to identify risk factors associated with erectile dysfunction in post-transurethral prostate resection (TURP) patients for the management of benign prostatic hyperplasia (BPH). **Material & Methods:** During 2019, 22 patients met the TURP indication criteria in the urology polyclinic of Koja Hospital for symptomatic BPH management. All patients underwent transabdominal ultrasonography to confirm prostate volume and underwent laboratory tests to measure serum prostate-specific antigen (PSA). History of comorbidities such as diabetes mellitus, cardiovascular events, and hypertension was recorded. The patient's sexual function was determined using the International Index of Erectile Function questionnaire (IIEF-5) before surgery and six months postoperatively, where erectile dysfunction was established for scores below 21. Mean comparisons were made to see if there was a significant change in IIEF score six months postoperatively. **Results:** There were 22 subjects as samples with a mean age of  $63 \pm 3.8$  years, prostate volume  $47.64 \pm 5.5$  mL and a median PSA level of  $3.3 [1-47]$  ng/dL. The comorbidities found in the subjects were diabetes mellitus (22.7%), cardiovascular events (36.4%), and hypertension (27.3%). The mean IIEF-5 score before surgery was  $14.55 \pm 0.78$  and was not significantly different ( $p = 0.225$ ) with a reevaluation six months after surgery of  $14.18 \pm 0.76$ . **Conclusion:** There was no change in the severity of erectile dysfunction in patients undergoing TURP surgery.

**Keywords:** Erectile dysfunction, TURP, BPH.

## ABSTRAK

**Tujuan:** Mengidentifikasi faktor risiko yang berkaitan dengan disfungsi ereksi pada pasien-pasien pasca reseksi prostat transuretra (TURP) untuk tatalaksana pembesaran prostat jinak (BPH). **Bahan & Cara:** Selama tahun 2019, didapatkan 22 pasien yang memenuhi kriteria indikasi TURP di poliklinik urologi RSUD Koja untuk tatalaksana BPH simptomatik. Seluruh pasien menjalani pemeriksaan ultrasonografi transabdominal untuk mengkonfirmasi volume prostat dan menjalani pemeriksaan laboratorium untuk mengukur PSA serum. Riwayat komorbiditas seperti diabetes mellitus, kejadian kardiovaskular, dan hipertensi dicatat. Fungsi seksual pasien ditentukan menggunakan kuisioner international Index of Erectile Function (IIEF-5) sebelum operasi dan 6 bulan pasca operasi di mana disfungsi ereksi ditegakkan untuk nilai skor di bawah 21. Perbandingan rerata dilakukan untuk melihat adanya perubahan skor IIEF yang bermakna pada 6 bulan pasca operasi. **Hasil:** Didapatkan sebanyak 22 subyek sebagai sampel dengan rerata usia  $63 \pm 3.8$  tahun, volume prostat  $47.64 \pm 5.5$  mL dan median kadar PSA darah  $3.3 [1-47]$ . Kejadian komorbiditas yang ditemukan pada subyek adalah diabetes mellitus (22.7%), kejadian kardiovaskular (36.4%), dan hipertensi (27.3%). Rerata skor IIEF-5 sebelum operasi adalah  $14.55 \pm 0.78$  dan tidak berbeda bermakna ( $P = 0.225$ ) dengan hasil re-evaluasi 6 bulan pasca operasi sebesar  $14.18 \pm 0.76$ . **Simpulan:** Tidak didapatkan perubahan keparahan disfungsi ereksi pada pasien-pasien yang menjalani operasi TURP. Faktor komorbiditas seperti diabetes mellitus dapat mempengaruhi fungsi seksual pasien BPH sebelum maupun setelah operasi.

**Kata kunci:** Disfungsi ereksi, TURP, BPH.

Correspondence: Maruto Harjanggi; c/o: Department of Urology, Faculty of Medicine/Universitas Indonesia, Cipto Mangunkusumo General Hospital. Jl. Diponegoro No.71, Jakarta 10430, Indonesia. Phone: (021)1500135. Email: maruto@urologi.id.

## INTRODUCTION

Sexual function is considered to be an important part of fulfilling a person's quality of life

(QoL). The survey shows that the male population over 50 years has a high rate of sexual dysfunction.<sup>1-2</sup> Evidence gathered from various studies and community-based studies suggests a link between

sexual dysfunction and lower urinary tract symptoms (LUTS).<sup>3-5</sup> In the male population over 50 years, LUTS is caused primarily by benign prostate hyperplasia (BPH). To manage this condition, transurethral prostate resection (TURP) has become standard therapy. However, TURP in male patients with LUTS is closely related to sexual dysfunction. One systematic review study showed that at least 75% of potent patients with normal sexual activity experienced retrograde ejaculation and about 13% of patients experienced impotence after undergoing TURP surgery.<sup>6</sup> It should be noted, however, that studies examining post-TURP sexual dysfunction do not always have the same standardization regarding the reduced definition of sexual dysfunction.

## OBJECTIVE

This study was conducted to evaluate the magnitude of the incidence of erectile dysfunction after the TURP procedure using the International Index of Erectile Function (IIEF-5) scoring.<sup>7</sup> The secondary objective of this study was to identify risk factors associated with the incidence of erectile dysfunction in patients who have undergone TURP.

## MATERIAL & METHODS

A total of 22 patients underwent TURP at Koja Hospital during 2019 for the management of benign prostate enlargement (BPH). Table 1 shows the inclusion and exclusion criteria used.

All patients underwent an ultrasound examination prior any procedures to measure prostate volume. Blood tests were performed to measure serum PSA levels and medical record data retrieval of other comorbidities such as diabetes mellitus, cardiovascular events, and hypertension as patient characteristics data. To measure the patient's erectile function, the IIEF-5 questionnaire was used as an evaluation instrument.<sup>7</sup> Erectile dysfunction in this study was defined as a total score of IIEF-5 questionnaire less than 21. Erectile function reevaluation in patients undergoing TURP will be

performed using IIEF-5 at 6 months postoperatively.

The collected data were analyzed using SPSS version 20 (IBM, USA).<sup>8</sup> Numerical data with normal distribution will be listed using mean  $\pm$  SD, while the normality test is performed using the Kolmogorov-Smirnov test. Comparisons between groups were performed using paired t-test. A p-value  $<0.05$  was determined as the limit of significance for the statistical differences found.<sup>9</sup>

## RESULTS

In this study, a total of 22 research subjects were collected, whose characteristics are listed in Table 2. The mean age of the subjects was  $63 \pm 3.8$  years. The prostate volume in patients undergoing TURP was  $47.64 \pm 5.5$  mL with a median serum PSA concentration of 3.3ng/dL. The minimum and maximum serum PSA concentrations of the subjects were 1 and 47ng/dL. Total of 22 subjects who were enrolled, 5 individuals (22.7%) had a history of diabetes mellitus, 8 individuals (36.4%) had a history of cardiovascular events, and a history of hypertension was found in 6 individuals (27.3%).

The mean score of sexual function measurement using IIEF-5 before TURP was  $14.55 \pm 0.78$ . The distribution of the IIEF-5 score results is presented in Table 4. The preoperative measurement found that 7 individuals (32%) had mild erectile dysfunction and 15 individuals (68%) had moderate erectile dysfunction. There were no subjects without erectile problems in this study. On reevaluation of sexual function at 6 months postoperative, the mean IIEF-5 was  $14.18 \pm 0.76$ . There was a change in distribution where 17 individuals (77%) had moderate erectile dysfunction, 5 individuals (23%) had mild erectile dysfunction, and 0 individuals (0%) had severe erectile dysfunction. However, there were no individuals without erectile dysfunction at the end of the 6-month postoperative reevaluation. Paired T-test results on the mean IIEF-5 score before and 6 months postoperatively showed insignificant results (p-value 0.225) and are shown in Table 3.

**Table 1.** Patient inclusion and exclusion criteria for the management of transurethral prostate resection.

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> <li>• Symptomatic BPH</li> <li>• Obstruction with or without a catheter</li> <li>• IPSS &gt; 7</li> </ul>	<ul style="list-style-type: none"> <li>• Neurogenic Bladder Dysfunction and / or sphincter decompensation</li> </ul>

**Table 2.** Clinical characteristics of study subjects.

Characteristics	
Number of Patients	22
Age (years), mean ± SD	63 ± 3.8
Prostate volume (cc), mean ± SD	47.64 ± 5.5
Serum PSA (ng / dL), (median [range])	3.3 [1-47]
Comorbidity in all population	
- Diabetes mellitus (%)	22.7%
- Cardiovascular events (%)	36.4%
- Hypertension (%)	27.3%
IIEF-5 Preoperative (mean ± SD)	14.55 ± 0.78
IIEF-5 6 months postoperative (mean ± SD)	14.18 ± 0.76

**Table 3.** Comparison of mean IIEF-5 values before and 6 months after TURP surgery.

	Baseline	6 months	p-value
	mean ± SD	mean ± SD	
International Index of Erectile Function (IIEF-5)	14.55 ± 0.78	14.18 ± 0.76	0.225

**Table 4.** Distribution of international Index of Erectile Function (IIEF-5) scores before and 6 months postoperatively in patients undergoing transurethral resection of the prostate.

IIEF-5 score	Number of patients before surgery	Number of patients 6 months postoperatively
5-10 (severe erectile dysfunction)	0 (0%)	0 (0%)
11-15 (moderate erectile dysfunction)	15 (68%)	17 (77%)
16-20 (mild erectile dysfunction)	7 (32%)	5 (23%)
21-25 (normal)	0 (%)	0 (0%)

## DISCUSSION

BPH is a condition that is mostly found in male patients with increasing age. The incidence of BPH is also associated with sexual dysfunction. Therapy for BPH has also been linked to the incidence of erectile dysfunction and sexual dysfunction. Ejaculatory dysfunction is one of the main problems associated with the medical and surgical management of BPH. In this study, we presented the findings on the management of 22 postoperative TURP patients that had been carried out in 2019.

The incidence of post-TURP erectile dysfunction in patients with BPH is still a matter of debate. Several studies have reported that this incidence rate can range from 4-35%<sup>10-12</sup> and increases with age or history of erectile dysfunction before the procedure.<sup>12-13</sup> Various hypotheses have been developed to explain the cause of the increased

incidence such as damage to the cavernous nerve, fibrosis and cavernous artery thrombosis, psychological changes due to failure of ejaculation, and urethral sphincter insufficiency.<sup>12-14</sup> However studies that have been conducted has not shown a conclusive conclusion.

There were no significant differences between the IPSS scores before and 6 months after surgery in this study. However, in other studies, diabetes and intraoperative capsular perforation were associated with an increased incidence of post-TURP erectile dysfunction. Based on studies that have been performed using larger samples, as many as 30% of patients with diabetes mellitus eventually experience postoperative dysfunction while 62% of patients with intraoperative capsular perforation experience erectile dysfunction at 6 months postoperatively. The study results confirm this finding by Tscholl et al.<sup>12</sup> where capsular perforation was associated with postoperative erectile function risk. This association

is thought to occur due to damage to the cavernous nerve, whose anatomical location is very close to the prostate capsule so that it is easily damaged if there is capsular perforation. Tcholl et al.<sup>12</sup> also reported an association between small adenoma cases and the incidence of postoperative erectile dysfunction due to an increased risk of capsular perforation. On the contrary, in large adenomas cases, the cavernous nerve has a greater distance from the resection site so that there is less risk of postoperative damage. The incidence of post-TURP potency reduction in patients with perioperative capsular perforation was also reported by the study by Hanbury et al.<sup>13</sup> and Bieri et al.<sup>14</sup> with a reported incidence of postoperative erectile dysfunction of 17.5 and 32.5%.

The finding of an association of erectile dysfunction with capsular penetration is not surprising. In a study examining transurethral resection of cases of posterior urethral adenoma in 131 male patients,<sup>15</sup> no sexual dysfunction (such as hemospermia and retrograde ejaculation) occurred postoperatively. This may be explained because resection of the tumor in the posterior urethra does not destroy the prostate's intact structure and is therefore not associated with postoperative ED.

In another study conducted by Taher,<sup>16</sup> diabetes mellitus was found to be a risk factor significantly associated with the incidence of postoperative erectile dysfunction. This association is made possible by the increased susceptibility of the cavernous nerve to heat and damage in patients with chronic hyperglycemia. In that study, the incidence of postoperative erectile dysfunction was 14%.

Other studies show other risk factors for erectile dysfunction in postoperative transurethral resection patients for BPH. For example, Tschool et al.<sup>12</sup> found an association between age and the incidence of postoperative erectile dysfunction. Especially in patients over 65 years of age who were newly diagnosed with erectile dysfunction, as many as 8.3% of whom had a TURP history. Perera and Hill<sup>17</sup> also found a similar picture wherein patients with postoperative erectile dysfunction had a history of 17.3% of whom had a history of TURP. The risk factors that contributed significantly to the incident were acute retention and bleeding during surgery. Zohar et al.<sup>18</sup> through his research also reported that post prostate surgery, patients with impotence had a higher anxiety rate. If the patient is not provided with preoperative counseling, these patients will be more likely to complain about the condition of their sexual function after the TURP procedure.

This study is the first prospective study at our center to evaluate sexual function before and after TURP surgery. In this study, patients with postoperative sexual dysfunction did not have different characteristics from patients who did not have postoperative sexual dysfunction when assessed by age, prostate volume, and total pre-treatment scores. So it can be drawn a picture that the non-significant difference in IIEF values before and after surgery in this study did not occur by confounding and other factors outside the intervention (surgery) performed. In this study, researchers also found that the incidence of erectile dysfunction was 68%. Although the incidence of moderate erectile dysfunction of 68% seems very high, it should be noted that the male population in this study does not represent an average population.

Only patients with an indication for TURP were included in this study, and it is known in other studies that the incidence of erectile dysfunction in BPH patients indicated for similar TURP was up to 70%.<sup>19</sup> Only a few (32%) patients had mild erectile dysfunction on the preoperative measurements, and none of the patients had severe or no erectile dysfunction in this study. At 6 months postoperatively, there was an increase in the number of patients with moderate erectile dysfunction to 77%, while the remaining 23% had mild erectile dysfunction. There were no patients with severe erectile dysfunction at the 6-month postoperative reevaluation.

## CONCLUSION

The findings of this study, there was no difference in preoperative and 6 months postoperative sexual function in patients undergoing TURP at Koja Hospital.

## REFERENCES

1. Feldman HA, Goldstein I, Hatzichristou DG, Krane RJ, McKinlay JB. Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. *J Urol* 1994; 151: 54–61.
2. Tsitouras PD, Martin CE, Harman SM. Relationship of serum testosterone to sexual activity in healthy elderly men. *J Gerontol* 1982; 37: 288–93.
3. Paick SH, Meehan A, Lee M, Penson DF, Wessells H. The relationship among lower urinary tract symptoms, prostate specific antigen and erectile dysfunction in men with benign prostatic hyperplasia: results from the proscar long-term efficacy and safety study. *J Urol* 2005; 173: 903–7.

4. van Dijk M, Skrekas T, de la Rosette JJ. The association between lower urinary tract symptoms and sexual dysfunction: fact or fiction? *Curr Opin Urol* 2005; 15: 39–44.
5. Chung WS, Nehra A, Jacobson DJ, Roberts RO, Rhodes T, Girman CJ, et al. Lower urinary tract symptoms and sexual dysfunction in community-dwelling men. *Mayo Clin Proc* 2004; 79: 745–9.
6. US Department of Health and Human Services. Benign Prostatic Hyperplasia: Diagnosis and Treatment. Bethesda MD: Agency for Health Care Policy and Research; 1994.
7. Rosen RC, Cappelleri JC, Smith MD, Lipsky J, Pena BM. Development and evaluation of an abridged, 5-item version of the International Index of Erectile Function (IIEF-5) as a diagnostic tool of erectile dysfunction. *Int J Impot Res* 1999; 11: 319–26.
8. STSC PLUS\*WARE software product. Statgraphics User's Guide. Rockville, MD: STSC; 1986.
9. Armitage P, Berry G, Matthews JNS. *Statistical Methods in Medical Research*. Melbourne: Blackwell Publishing; 2002. P162.
10. Lindner A, Golomb J, Korczak D, Keller T, Siegel Y. Effects of prostatectomy on sexual function. *Urology* 1991; 38: 26–8.
11. Soderdahl D, Knight R, Hansberry K. Erectile dysfunction following transurethral resection of the prostate. *JUrol* 1996; 156: 1354–6.
12. Tscholl R, Largo M, Poppinghaus H, Recker F, Subotic B. Incidence of erectile impotence secondary to transurethral resection of benign prostatic hyperplasia, assessed by preoperative and postoperative Snap Gauge tests. *J Urol* 1995; 153: 1491–3.
13. Hanbury D, Sethia K. Erectile function following transurethral prostatectomy. *Br J Urol* 1995; 75: 12–3.
14. Bieri S, Iselin CE, Rohner S. Capsular perforation localization and adenoma size as prognosis indicator of erectile dysfunction after transurethral prostatectomy. *Scand J Urol Nephrol* 1997; 31: 545–8.
15. Mi ZG, Yang XF, Liang XZ, Liu HY, Liu SY, Zhang H, et al. Adenoma of the posterior urethra: 131 case report. *Asian J Androl* 2001; 3: 67–70.
16. Taher A. Erectile dysfunction after transurethral resection of the prostate: incidence and risk factors. *World J Urol* 2004; 22: 457–60.
17. Perera ND, Hill JT. Erectile and ejaculatory failure after transurethral prostatectomy. *Ceylon Med J* 1998; 43: 74–7.
18. Zohar J, Meiraz D, Maoz B, Durst N. Factors influencing sexual activity after prostatectomy: a prospective study. *J Urol* 1976; 116: 332–4.
19. Brookes ST, Donovan JL, Peters TJ, Abrams P, Neal DE. Sexual dysfunction in men after treatment for lower urinary tract symptoms: evidence from randomised controlled trial. *BMJ* 2002; 324: 1059–61.