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The Evaluation of Impact of Transurethral Resection of Prostate on Sexual Function

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Abstract

Objective: To evaluate the impact of Transurethral Resection of Prostate (TURP) on Sexual Function.

Design: A quasi-experimental study.
Place and duration of study: conducted from 1/9/2021 to 31/12/2023 at The Kidney Centre, Karachi, Pakistan.

Methods: Total of 37 patients aged between 50–80 years were evaluated for the effects of TURP on sexual function. Pre- and post-operative sexual function was assessed using the International Index of Erectile Function (IIEF-15). Statistical analyses included paired t-tests, Wilcoxon sign-rank tests, and regression analysis to explore factors influencing changes in sexual function.

Results: Post-TURP, IIEF-15 scores showed a significant decline (54.8 ± 15.8 pre-op to 40.9 ± 18.4 post-op, $p < 0.001$). Diabetic patients experienced a more pronounced reduction in scores compared to non-diabetics (23.3 ± 20.1 vs. 10.4 ± 15, $p = 0.028$). Age negatively correlated with changes in orgasmic function and overall sexual performance, though not significantly. Declines were observed across all IIEF-15 components, including erectile function, orgasmic function, sexual desire, and intercourse satisfaction.

Conclusions: TURP significantly impacts sexual function, with diabetics and older patients showing greater vulnerability. Preoperative counseling about potential sexual outcomes is essential. Further research with larger cohorts is recommended to better understand these effects and optimize treatment strategies.

INTRODUCTION

Benign prostatic hyperplasia (BPH) is a clinical entity referring to the epithelial and glandular proliferation of prostate gland1. It commonly occurs in older population above the age of 50 years with its incidence increases with increasing age2. The prevalence of BPH has increased in the last 2 decades3. BPH has been linked to the development of lower urinary tract symptoms (LUTS) and deteriorating sexual function in males4. The management of BPH is divided into medical and surgical treatment. Mainstay of medical management include alpha-blockers and 5-alpha reductase inhibitors5. After the failure of medical therapy, the management relies on the surgical treatment6 including transurethral resection of prostate (TURP), transurethral incision of prostate (TUIP), simple prostatectomy, transurethral laser vaporization7, ablation, and enucleation8. Despite the development of different minimally invasive techniques, TURP remains the gold standard treatment for BPH. As with any surgical intervention, TURP also has some side effects9 associated with it which include TURP syndrome10, retrograde ejaculation, erectile dysfunction11, bleeding, incontinence12, bladder neck contracture13 and urinary tract infection14. Hemorrhage can occur in 0.4% to 7% of patients and can lead to serious consequences like clot retention requiring bladder wash and additional procedures for controlling bleeding15. This study focused on sexual dysfunction caused by TURP. Jaidane et al conducted a prospective comparative study on 50 patients with BPH and concluded that after TURP there was an improvement in 4 out of 5 domains of IIEF-15 which was linked to the improvement in urinary symptoms after turp. The pre-operative IIEF-15 score was 26.2 compared to 49.64 postoperatively16. Conversely, Pavone et al conducted a retrospective study on 264 patients to assess sexual function after TURP17. There was negative impact on ejaculatory function but not on the erectile function. 5.8% of the patients having good erectile function pre-operatively had worsening of their erectile function. 3.7% of the patients having mild to moderate dysfunction preoperatively had worsening of their Symptoms while 16.2% had an improvement. Overall retrograde ejaculation was found in 48% of the patients. Similarly, Julian et al conducted a systemic review and concluded that majority of studies showed no changes in erectile dysfunction following surgical management for TURP18. In the light of above discussion, it is clear that no conclusive evidence is extracted regarding effects of TURP on sexual function.

METHODOLOGY

A quasi experimental Study was conducted at Department of urology, the Kidney Centre postgraduate Training Institute, Karachi, Pakistan. The study duration was from 2021 to 2023. Sample size was calculated by using G-power sample size calculator. Baseline IIEF-15 score 18.63 +/- 2.49, IIEF-15 score after 3 months 17.30+/- 2.1014, power 95% and confidence interval 95%. The required sample size for this study was 42. Non-probability consecutive sampling was used as the sampling technique. Due to slow recruitment of participants, a sample of 37 was collected.

All the patients undergoing Transurethral resection of prostate aged between 50-80 years were included in the study after obtaining consent from the patients. Only patients with well controlled comorbidities were included in the study to minimize the compounding factors. Patients aged > 80 years, not giving consent, PSA > 4.0, preoperative creatinine> 1.5mg/dl, patients with uncontrolled DM i.e. HBA1C > 7.5%, patients with uncontrolled HTN i.e. BP > 140/90mmhg for more than 5 years or patients undergoing multiple procedures at the same time were excluded from this study.

After taking approval from ethics review committee of our institute, the patients who fulfilled the inclusion criteria were included in this study. Informed written consent was taken from each patient. Data was collected manually from patient's record file as well as directly from the patients of BPH who presents in our OPD and used alpha blockers with or without 5 alpha reductase inhibitors and have failed medical management who are planned to undergo TURP. The patients underwent one on one interview with researcher. They were evaluated pre operatively about their demographic data and comorbidities like Diabetes, Hypertension, and obesity using the variables mentioned in questionnaire. Patients were evaluated for their sexual function using IIEF-15 score by primary researcher. Prostate volume was determined using ultrasound 10 days prior to surgery. After that patients proceeded for their surgery. Surgeries were performed by senior urologist with more than 20 years of experience. The patients were given spinal anesthesia and were operated in lithotomy position. Monopolar resectoscope was then be used to resect prostate. Glycine was used as irrigation fluid. Patients were discharged on 2nd or 3rd post-operative day after given trial without catheter. They were called on follow-up at six weeks with

Uroflowmetry and at 3 months for post-operative evaluation of sexual function by IIEF-15 Performa, which was compared with pre-operative scores.

The data was analyzed using IBM SPSS version 26. Cleaning, coding, and editing were done before analysis. Categorical data was expressed in Frequency with percentage, while mean with standard deviation was calculated for the continuous variables. The normality of the continuous data was checked by the Shapiro-Wilks test, box and whisker plot, and level of skewness. We applied the Paired t-test in normally distributed data, on the other hand Wilcoxon sign rank test was used to detect pre and post-difference in the variables. The differences between the two groups' mean were detected by an independent t-test in the normal distribution, while the Mann Whitney-U test in the case of skewed data. According to the normality of variables, ANOVA or Kruskal-Wallis H test was executed for more than two groups. The correlation between variables was observed by Pearson correlation. Univariate linear regression was done to find the effect of risk factors on the IIEF 15 scores and correlation coefficient and R2 were calculated. A p-value of ≤ 0.05 will be considered as a significance level.

RESULTS

A total of 37 patients were recruited for our study who met the inclusion and exclusion criteria.

The mean age was 61.8 ± 7.8 years, ranging from 50 to 80 years. Of the participants, 11 (29.7%) were diabetic, and 10 (27%) had hypertension (Table 1). When comparing the pre-and post-operative mean IIEF-15 scores, we observed a significant reduction following TURP ($p < 0.001$). The mean score dropped from 54.8 ± 15.8 to 40.9 ± 18.4, with this decline evident across all components of the IIEF-15 (Table 2).

Further analysis revealed that this decrease in sexual function, as measured by the IIEF-15, differed significantly between diabetic and non-diabetic patients ($p = 0.028$). The reduction was more pronounced in diabetics than in non-diabetics (23.3 ± 20.1 vs. 10.4 ± 15). Although all components of the IIEF-15 showed a greater decline in diabetics compared to non-diabetics, the p-values were not statistically significant (Table 3).

We also found a negative correlation between age and the difference in IIEF-15 scores post-TURP. The correlation coefficient of -0.28 suggests that for each additional year of age, the pre- to post-operative IIEF-15 difference decreased by 28%, though this result was not statistically significant ($p = 0.089$). In regression analysis, the R^2 value of 0.08 indicated that age accounted for 8% of the variability in the change in IIEF-15 scores, with the remaining variation influenced by other factors (Figure 1).

Similarly, the correlation coefficient of -0.27 indicates that erectile function was decreased by 27% with each additional year of age (Figure 2).

Among the IIEF-15 components, orgasmic function was significantly correlated with age ($p = 0.034$). Specifically, for each additional year of age, the difference in orgasmic function scores decreased by 35%. Additionally, 12.2% of the variability in this score was attributed to age ($R^2 = 0.122$) (Figure 3).

On the other hand, the effect of increasing age on sexual desire and inter-course satisfaction was only 12% and 7% respectively while R2 states that age attributed 1.5% of the variability within sexual desire and 1.2% variation in inter-course satisfaction (Figure 4 &5)

Table: 1 Baseline parameters of the patients n=37		**Mean ± STD / n (%)**
Age		61.8 ± 7.8
Weight		70.3 ± 17
HTN		11(29.7)
DM		10(27)
HbA1c	≤ 6.5	2(5.4)
	> 6.5	7(18.9)
UFM	1 – 5	6(16.2)
	6 - 10	6(16.2)
	> 10	9(24.3)
Prostate size	< 40	6(16.2)
	46 -60	14(37.8)
	60 - 80	8(21.8)

	> 80	9(24.3)
Resection time in minutes		85.1 ± 22.6
Post-operative days of catheterization		3.4 ± 1.6

Table: 2 Comparison of pre- and post-operative mean scores of the International Index of Erectile Function Mean ± STD

Parameters	Pre-Operative	Post-Operative	P- Value
Total IIEF 15 score	54.8 ± 15.8	40.9 ± 18.4	< 0.001
Erectile function score	21.8 ± 7.6	16.4 ± 8.8	<0.001
Orgasmic function score	7.9 ± 2.7	5.2 ± 2.7	< 0.001
Sexual desire score	7.2 ± 2.2	6 ± 2.4	0.004
Intercourse satisfaction score	9.4 ± 3.3	7.1 ± 4.3	0.001

Table: 3 Effect of Diabetes and prostate volume on the difference in pre and post-operative erectile function Mean ± STD

Erectile function Parameters	Diabetic	Non-Diabetic	P Value	prostate Volume				P Value
				< 40	40 - 60	60 -80	> 80	
Total IIEF 15 score	23.3 ± 20.1	10.4 ± 15	0.028	2.3 ± 21.3	6.4 ± 18.2	0.3 ± 16.7	4.3 ± 17.3	0.804
Erectile function score	9.3 ± 9.4	4 ± 7.4	0.203	6 ± 9.3	7.3 ± 7.4	1 ± 9.5	6.1 ± 7.2	0.523
Orgasmic function score	4 ± 3.4	2.2 ± 3.1	0.216	1.3 ± 3.1	2.6 ± 3.3	4.1 ±2.9	2.6 ± 3.6	0.461
Sexual desire score	2.2 ± 2.9	0.9 ± 1.95	0.242	0.5 ± 2.9	1.6 ± 2.5	0.8 ± 1.9	1.6 ± 2	0.485
Intercourse satisfaction score	2.9 ± 6.1	2 ± 2.5	0.538	2.8 ± 4.3	3.9 ± 1	4.4 ± 1.6	2.2 ± 0.8	0.641

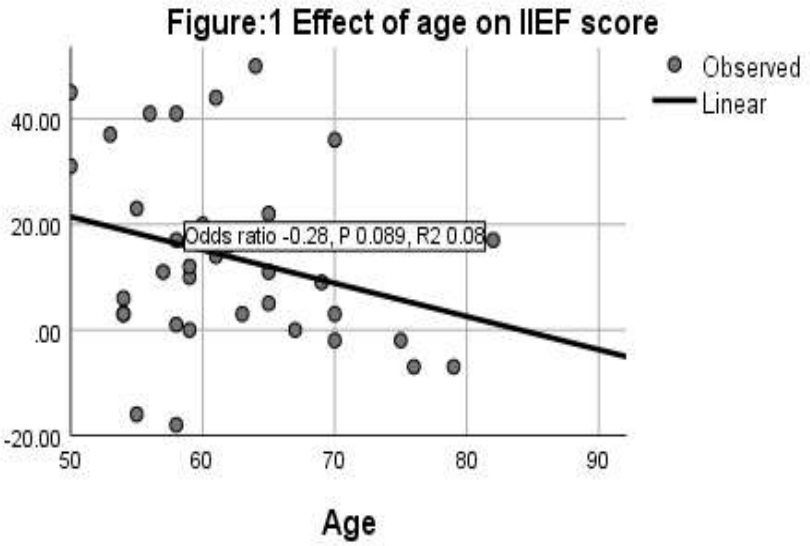


Figure:2 Effect of age on erectile function

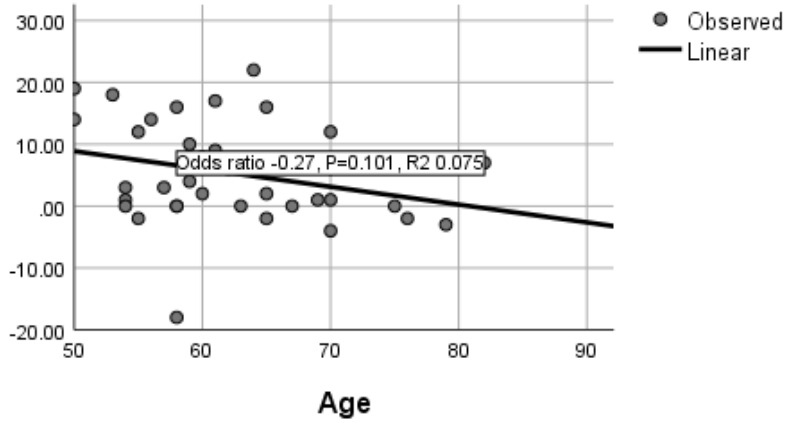


Figure:3 Effect of age on Orgasmic function

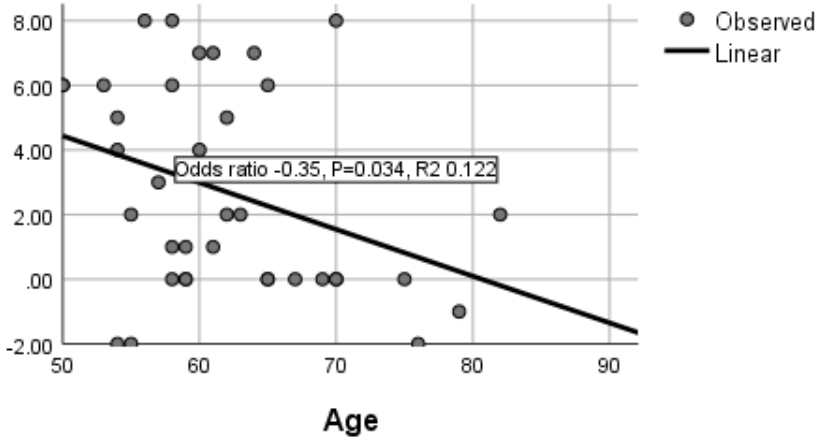
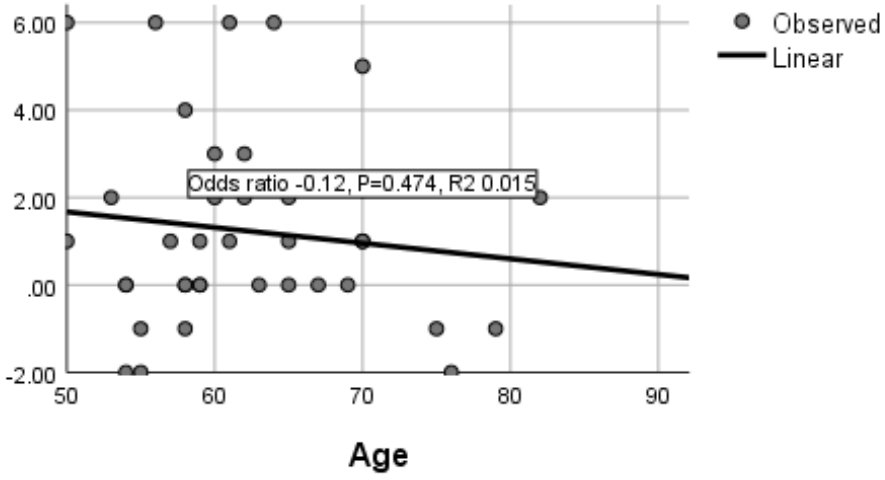


Figure:4 Effect of age on sexual desire score



DISCUSSION

Clinical benign prostatic hyperplasia (BPH) with lower urinary tract symptoms (LUTS) in elderly men is one of the most common diseases. The parameters of the disease progression include prostate-specific antigen (PSA), older age, prostate volume, International Prostate Symptom Score, and reduced urine flow. The gold standard technique for surgical treatment of clinical BPH with benign prostate obstruction is the transurethral resection of the prostate (P-TUR). Our study included a total of 37 patients who met the inclusion and exclusion criteria.

In our study when comparing the pre-and post-operative mean IIEF-15 scores, we observed a significant reduction following TURP ($p < 0.001$). The mean score dropped from 54.8 ± 15.8 to 40.9 ± 18.4. This decline was seen across all components of the IIEF-15, including erectile function, orgasmic function, sexual desire, and intercourse satisfaction. These results are consistent with other studies that have documented a decrease in sexual function following TURP, although the extent of this impact has varied across patient populations and study designs.

A key finding of this study is the pronounced reduction in sexual function among diabetic patients. Diabetics showed a significantly greater decline in IIEF-15 scores compared to non-diabetics (23.3 vs. 10.4, $p = 0.028$). This suggests that diabetes, which itself is a known risk factor for erectile dysfunction, exacerbates the decline in sexual function post-TURP. The relationship between diabetes and sexual dysfunction is likely multifactorial, involving both vascular and neurogenic components. Diabetic patients undergoing TURP may already have compromised erectile function due to underlying endothelial dysfunction, which could explain their greater vulnerability to postoperative sexual decline.

Age also emerged as a factor influencing postoperative sexual function, with older patients experiencing a more significant reduction in orgasmic function and overall IIEF-15 scores, although this correlation was not statistically significant. The negative correlation coefficient (-0.28) indicates that sexual function deteriorates with age, a finding consistent with previous literature. Age-related declines in erectile function are well-documented and may be due to diminished vascular and hormonal function. While TURP itself may not directly cause erectile dysfunction, the cumulative effects of age, comorbidities, and the surgery can contribute to an overall decline in sexual health.

In a study conducted by Oka AAG et al, they noted that 80.7% of patients developed erectile dysfunction secondary to LUTS. They found total effect of 0.921 on chi-square test which showed an improved significance between the correlation of the IIEF score before P-TUR and 1 month after P-TUR. In addition, they also found an improved significant correlation between IIEF after 1 month P-TUR and 3 months post-P-TUR19. In 2021, Kakar et al, published an article regarding the effects of TURP on erectile function in BPH. They found out that mean age of patients was 60.47 years, mean duration of BPH was 15.83 months and mean prostate volume was 64.12 ml. There was significant difference in pre-op and post-op IIEF score20. Mean pre-op IIEF was 16.72 and mean postop IIEF 11.50 (p-value<0.001), although they used IIEF-5 score rather than IIEF-15 used in our study.

These finding were also consistent with our study showing that IIEF decreases post TURP.The research conducted by Eshøj et al. (2020)18 assesses the effectiveness of neuromuscular shoulder exercise (SINEX) in comparison to standard care exercise (HOMEX) for patients experiencing traumatic anterior

shoulder dislocations. The findings indicate that SINEX outperformed HOMEX in enhancing shoulder functionality, alleviating pain, and possibly reducing the necessity for shoulder stabilizing surgery. This investigation offers significant insights into nonoperative treatment alternatives for individuals with traumatic anterior shoulder dislocations, thereby enriching the comprehension of effective rehabilitation strategies in these scenarios.

CONCLUSION

In conclusion, our study reinforces the notion that TURP, while effective for managing LUTS in BPH patients, is associated with a significant decline in sexual function, especially in diabetic and older patients. It is crucial to have a preoperative assessment of erectile function and informed discussions about potential sexual outcomes. Urologists must weigh the benefits of symptom relief against the potential impact on sexual health, tailoring treatment approaches to each patient's unique needs and preferences. Further multicenter randomized control trials with larger population are needed to further evaluate the effect TURP has on sexual function.

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