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TO DETERMINE THE MEAN CHANGE OF TRANSURETHRAL RESECTION OF PROSTATE (TURP) ON ERECTILE FUNCTION IN PATIENTS OF BENIGN PROSTATIC HYPERPLASIA (BPH) IN A TERTIARY CARE HOSPITAL

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Abstract:

Introduction: *Benign prostatic hyperplasia (BPH) affects approximately 210 million men globally and is a major cause of lower urinary tract symptoms (LUTS) in men. Transurethral resection of the prostate (TURP), the standard surgical therapy for the treatment of bladder outlet obstruction (BOO) caused by benign prostatic hyperplasia (BPH), is also reported to cause sexual dysfunction as well. It is known that TURP may cause retrograde ejaculation, but its effect on erectile function is still controversial.*

Objective: *To determine the mean change of transurethral resection of prostate (TURP) on erectile function in patients of benign prostatic hyperplasia (BPH) in a tertiary care hospital.*

Study Design: *Quasi Experimental study.*

Setting: *The study was completed at department of Urology, Sindh Institute of Urology and Transplantation, Karachi.*

Duration of Study: *01-Nov-2018 to 30-April-2019.*

Patients and Methods: *A total number of 261 patients who presented with acute urinary retention due to BPH and planned for TURP having age 50-70 years were included in this study. Before TURP validated International Index of Erectile Function (IIEF) scoring proforma was filled for all patients and EF score was calculated. TURP was done by consultant urologists having a minimum of 3 years post-fellowship experience. After 1 month of surgery the patients were called for follow up visit to fulfill the IIEF questionnaire. After receiving the filled questionnaire back, IIEF score was calculated.*

Results: *Mean age of patients was 60.47+5.43 years. Mean duration of BPH was 15.83+6.48 months. Mean prostate volume was 64.12+11.46 ml. There was significant difference in pre-op and post-op IIEF score. Mean pre-op IIEF was 16.72+5.29. and mean post-op IIEF 11.50+3.01 (p-value <0.001). stratification of age, duration of BPH and pre-op prostate volume was done. There was no significant effect of these confounder variables on pre-op and post-op erectile dysfunction.*

Conclusion: *Transurethral resection of prostate is significantly associated with reduction in erectile function in patients of benign prostatic hyperplasia.*

Keywords: *benign prostatic hyperplasia, erectile dysfunction, IIEF score,*

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INTRODUCTION:

Benign prostatic hyperplasia (BPH) affects approximately 210 million men globally and is a major cause of lower urinary tract symptoms (LUTS) in men.[1] An estimated 50% and 75% of men have histologic evidence of BPH by the age of 50 and 80 years, respectively, with approximately 50% of them having clinically considerable symptoms.[2]

Transurethral resection of the prostate (TURP), the standard surgical therapy for the treatment of bladder outlet obstruction (BOO) caused by benign prostatic hyperplasia (BPH), is also reported to cause sexual dysfunction as well. It is known that TURP may cause retrograde ejaculation, but its effect on erectile function is still controversial.[3,4]

Previous studies have shown that the incidence of erectile dysfunction (ED) after TURP is between 4% and 40%.[5]
A study conducted by Choi et al. found considerable decrease in erectile function (EF) before TURP from mean EF score of 10.9±10.15 and 7.79±8.52 in patients of BPH after 1 month of TURP.[6] On the other hand Jaidane et al. found improvement in EF score after TURP. In their study mean EF score before TURP was 26.2 and it increased to 47.83 after 3 months of TURP.[7] Like these two studies many other studies have also found very controversial results regarding erectile function in patients of BPH after TURP.[8, 9] The wide-ranging in incidence of ED after TURP reported in literature is caused by the different methods used for assessing it. ***Serious drawbacks in the studies dealing with sexual dysfunction after TURP are the lack of a standard definition of sexual dysfunction, not using of validated questionnaires, different lengths of postoperative follow up periods, and different operating surgeons and a lack of evaluation for phosphodiesterase-5 (PDE5) inhibitors naïve patients.***[9] The aim of the proposed study is to determine the effect of TURP on erectile function in patients of BPH in a tertiary care hospital of Pakistan using a validated International Index of Erectile Function (IIEF).[10] because IIEF questionnaire has now been recognized as the standard method for assessment of EF after TURP. Because very few studies have still used this IIEF questionnaire for EF assessment. ***And as mentioned above some studies have found improved EF score after TURP, while some have found detrimental effect of TURP on EF score.***[6-9] So there is need to conduct more research work on this issue to determine either TURP is associated with improved EF or reduced EF in BPH patients in our population. This study will help in the counseling of patients regarding the benefits, improvement in the quality of life and making local guidelines. Before this there are studies which mostly focused on late effects of TURP on erectile functions 3 and 6 months we are studding immediate effects of TURP on erectile functions after 1 month.

The risk of the transurethral resection (TUR) syndrome. This feature gives the surgeon more surgical time to resect larger glands. Additionally, because the bipolar TURP has both electrodes in the resectoscope, it uses lower energy, and a lower temperature is developed at the resection site.

Akman et al. published an RCT on 286 patients randomized between monopolar and bipolar TURP. Data on 188 non-catheterized patients with IIEF-EF showed no significant difference among groups and from a baseline of 16.8 and 16.9 after 12 months follow-up. However, 10/55 patients with normal preoperative IIEF-EF developed ED (3 mild, 5 mild-to-moderate, and 2 moderate). Globally, EF worsened in 17%, improved in 28.2%, and remained unchanged in 54.8

OBJECTIVE:

To determine the mean change of transurethral resection of prostate (TURP) on erectile function in patients of benign prostatic hyperplasia (BPH) in a tertiary care hospital.

MATERIAL AND METHODS:

STUDY DESIGN:
Quasi Experimental study.

SETTING:
The study was completed at department of Urology, Sindh Institute of Urology and Transplantation, Karachi.

DURATION OF STUDY:
01-Nov-2018 to 30-April-2019.

SAMPLE SIZE:
Sample size for this study is calculated using the results of study of Choi et al. By taking pre-op IIEF score 10.09±10.15 and post of IIEF score 7.79±8.52,[6] power of test 80.0% and level of significance 5%, We will take 261 patients in our study.

SAMPLING TECHNAQUE: Non probability, Consecutive sampling

SAMPLE SELECTION:

Inclusion criteria:

- Patients having age 50 to 70 years.
- Only male population will be included in this study.
- Patients having duration of disease 6 months to 2 years will be included.
- Patients of BPH (as per operational definition)

Exclusion Criteria:

- Patients having diabetes mellitus or vascular disease (diagnosis will be made on previous history of patients).
- With history of previous surgery of bladder neck, prostate or pelvic region (assessed on previous history of the patient or presence of scar on prostate area). Because previous surgery can affect the outcome of treatment.
- Patients having prostate specific antigen > 4 ngm/ml.
- Patients having prostate <45ml.
- Patients having prostate>90ml.

DATA COLLECTION PROCEDURE:
After approval from research evaluation unit of college of physicians and surgeons of Pakistan. Patients who presented with acute urinary retention due to BPH and planned for TUPR in the department of urology of Sindh Institute of Urology and Transplantation were included in this study until the required sample size of 261 patients was completed. An informed consent was taken from all patients before including them in this study.

Before TURP validated International Index of Erectile Function (IIEF) scoring proforma was filled for all patients and EF score was calculated. TURP was done by consultant urologists having a minimum of 3 years post-fellowship experience. After 1 month of surgery the patients were called for follow up visit to fulfill the IIEF questionnaire. After receiving the filled questionnaire back, IIEF score was calculated. Data regarding patients age, duration of BPH and prostate volume was also noted on proforma given in annexure-I.

DATA ANALYSIS PROCEDURE:
Data analysis was carried out using SPSS v20.0. Mean and standard deviations was calculated for quantitative variables like age, duration of BPH disease, prostate volume, pre-op IIEF score and post-op IIEF score. Paired sample t-test was applied to compare to the pre-op and post-op 1 month IIEF score. Effect modifiers like age, duration of benign prostatic hyperplasia (BPH) and prostate volume was controlled by stratification. Post stratification paired sample t-test was applied to determine the effect of modifiers on the IIEF score, taking P-value <0.05 as significant.

RESULTS:

A total number of 261 patients of BPH were included in this study. Mean age of patients was 60.47+5.43 years. Minimum age was 50 years and maximum age was 70 years (Table 1).
Mean duration of BPH was 15.83+6.48 months. Minimum duration of BPH was 6.0 months and maximum duration of BPH was 24.0 months (Table 2).

Mean prostate volume was 64.12+11.46 ml. Minimum prostate volume was 45.0 ml and maximum volume was 90 ml (Table 3).

Mean pre-op IIEF was 16.72+5.29. Minimum IIEF was 8.0 and maximum IIEF was 28.0. Mean post-op IIEF 11.50+3.01. Minimum IIEF was 6.0 and maximum IIEF was 25.0. Mean change in IIEF was -4.66+4.62. Minimum change in IIEF was 10 and maximum change -18 (Table 4).

On comparison of mean pre-op and post-op IIEF score. There was significant difference in pre-op and post-op IIEF score. Mean pre-op IIEF was 16.72+5.29. and mean post-op IIEF 11.50+3.01. This difference was statistically significant with p-value of <0.001 (Table 5).

Stratification of age was performed. In patients having age 50-60 years. Mean pre-op IIEF was 17.28+5.74

and post-op IIEF score was 11.87+2.66, this difference was statistically significant with p-value of <0.001. In patients having age 61-70 years, mean pre-op IIEF was 16.30+4.90 and mean post-op IIEF was 11.22+3.23, with p-value of <0.001 (Table 6).

Stratification of duration of disease was also performed, mean pre-op IIEF was 16.58+5.07 and mean post-op IIEF was 10.98+2.90. This difference was statistically significant with p-value of <0.001. In patients having duration of BPH >12 months, pre-op IIEF was 16.82+5.46 versus 11.88+3.04 after one month of TURP (p-value <0.001) [Table 7].

Stratification of mean prostate volume was also performed. There was no significant effect of mean prostate volume on pre-op and post-op IIEF score between the group (Table 8).

Table 1. Descriptive Statistics of Age of Patients (Years).

Mean	60.47
Standard Deviation	5.43
Minimum	50.0
Maximum	70.0

Table 2. Descriptive Statistics of Duration of BPH (Months).

Mean	15.83
Standard Deviation	6.48
Minimum	6.0
Maximum	24.0

Table 3. Descriptive Statistics of prostate Volume (ml).

Mean	64.12
Standard Deviation	11.46
Minimum	45.0
Maximum	90.0

Table 4. Descriptive Statistics of Pre-op and Post-op IIEF Score.

	Pre-op IIEF Score	**Post-op IIEF**	**Mean Change IIEF**
Mean	16.72	11.50	-4.66
S.D.	5.29	3.01	4.62
Minimum	8.0	6.0	10.0
Maximum	28.0	25.0	-18.0

Table 5. Comparison of Pre-op and Post-op IIEF Score.

	Pre-op IIEF	**Post-op IIEF**	**P-value**
Mean	16.72	11.50	<0.001
S.D.	5.29	3.01	

Table 6. Stratification of Age to Determine the Effect of Age on Pre-op and Post-op IIEF Score.

(A) Age Group 50-60 Years.

	Pre-op IIEF	**Post-op IIEF**	**P-value**
Mean	17.28	11.87	<0.001
S.D.	5.74	2.66	

(B) Age Group 61-70 Years.

	Pre-op IIEF	**Post-op IIEF**	**P-value**
Mean	16.30	11.22	<0.001
S.D.	4.90	3.23	

Table 7. Stratification of Duration of BPH to Determine the Effect of Duration of BPH on Pre-op and Post-op IIEF Score.

(A) Duration of BPH 6-12 Months.

	Pre-op IIEF	Post-op IIEF	P-value
Mean	16.58	10.98	<0.001
S.D.	5.07	2.90	

(B) Duration of BPH >12 Months

	Pre-op IIEF	Post-op IIEF	P-value
Mean	16.82	11.88	<0.001
S.D.	5.46	3.04	

Table 8. Stratification of Prostate Volume to Determine the Effect of Prostate Volume on Pre-op and Post-op IIEF Score.

(A) Mean Prostate Volume 45-60 ml.

	Pre-op IIEF	Post-op IIEF	P-value
Mean	16.19	11.37	<0.001
S.D.	4.72	3.15	

(B) Mean Prostate Volume 51-90 ml.

	Pre-op IIEF	Post-op IIEF	P-value
Mean	17.12	11.60	<0.001
S.D.	5.66	2.90	

DISCUSSION:

LUTS caused by BPH is a common condition in elderly men and it is associated with a range of sexual dysfunctions. Because ED is also highly prevalent in elderly men, many groups have assessed the causal relationship between LUTS/BPH and ED.[11,12]

Some evidence supports the theory that these two conditions are simply coexisting, coincidental age-related conditions in aging men that are linked by several of the metabolic and hormonal changes that usually affect them. However, recent reports clearly show a direct correlation between the two diseases even after checking age, medications and concomitant co-morbidities. Therefore, BPH-related LUTS can be considered an age-independent risk factor for ED.[13]
It has been demonstrated that TURP has obvious advantages for patients suffering from severe LUTS secondary to BOO caused by BPH, but its role in erectile function is still controversial and the available evidence conflicts with the reported incidence rate in 4% and 40% of patients.[14,15]

The effect of TURP on erectile function may be brought about by several different mechanisms, including psychological changes due to ejaculatory failure or urethral sphincter insufficiency, cavernous nerve damage as a result of electrocoagulation, fibrosis or thrombosis of the cavernous arteries, but no conclusions have as yet been drawn.[16] Another possible mechanism is represented by the duration of urethral catheterization. In fact, it is known that urethral catheterization is associated with a significant risk of urinary tract infection (UTI). This is especially true in the frail elderly both at home and in the hospital. The increase in UTI is statistically significant and related to the insertion of urinary catheters. In particular, there are studies that showed that 100% of patients develop a UTI within 30 days of catheterization. Finally, it is reported that urethral catheterization is a risk factor for onset of MAGI (Male Accessory Gland Infections), which are associated with various forms of sexual dysfunction (ED, premature ejaculation, decreased sexual desire).[17,18]

In fact, there are many reports of impaired erectile function after TURP. Many studies have reported that ED after TURP occurs in between 4% and 35% of patients and that it is associated with age or pre-existing ED.[17,18] Until now, no conclusive determination has been made. Most studies have reported only on the incidence of de novo ED after TURP and not on the proportion of patients experiencing an improvement of erectile function.[19,20]

In present study, we found significant difference in pre-op and post-op IIEF score. Mean pre-op IIEF was 16.72+5.29. and mean post-op IIEF 11.50+3.01 (p-value <0.001).

In a study conducted by Favilla et al. also reported a significant decrease in IIEF after TURP. In their study, mean pre-op IIEF was 24 and it decreased to 18 after 12 months of TURP (p-value <0.001).[3]

But another study conducted by Jaidane et al. reported a significant increase in erectile function after TURP. In their study mean pre-op IIEF was 7.18 and after 3 months of TURP IIEF was increased to 20.74 (p-value <0.001).[7]

Several recent studies have shown a strong association between LUTS and ED. In the Multinational Survey of the Aging Male, LUTS were an independent risk factor for ED after controlling for age and comorbidities.[21]

CONCLUSION:

Transurethral resection of prostate is significantly associated with reduction in erectile function in patients of benign prostatic hyperplasia.

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