IMPACT OF TRANSURETHRAL RESECTION OF PROSTATE ON INTERNATIONAL PROSTATE SYMPTOM SCORE AND PEAK URINARY FLOW RATE

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Abstract:

Objectives: *To evaluate urinary symptoms and quality of life in patient with BPH before and after TURP. To determine the impact of TURP on the urinary symptoms (IPSS) and peak urinary flow rate.*

Methods: *This study is prospective study carried out between 2010 and 2011 in the department of Urology, National Institute of Kidney Diseases & Urology. Total 102 cases were selected purposively according to selection criteria. Each patient was observed and followed up at 8 weeks (1st visit), 16 weeks (2nd visit) 24 weeks (3rd visit) after transurethral resection of prostate (TURP). IPSS score, QOL score also recorded and uroflowmetry was done to see the peak urinary flow rate (Q_{max}) of urine and voiding time. USG was done to see post voidal residual urine volume and DRE also done in selected cases. Data was complied and statistical analysis were done using computer based software, Statistical Package for Social Science (SPSS), using paired 't' test. A P value <0.05 was taken as significance.*

Results: *Before TURP, IPSS range 17-25 and mean 21.61±2.43, after TURP, range 0-7 and mean 4.27±1.71). Hence a significant improvement of IPSS was found from 2 months to 6 months follow up after TURP. The change was tested using "paired student 't' test". Before TURP Q_{max} range 7-12.2 and mean was 9.96±1.69, which became range 18-25 and mean was 22.61±2.28 after TURP and therefore change of mean Q_{max} was 12.64±2.69. The change was tested using "paired student 't' test". The change was found significant (P<0.001).*

Conclusion: *Transurethral resection of prostate resolves obstructive symptoms, rapid improvement of urinary flow rate*

Key words: *Benign prostatic hyperplasia, IPSS, peak urinary flow rate, TURP.*

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Introduction

Benign Prostatic Hyperplasia (BPH) is a common condition in middle-aged and elderly men and its prevalence increases with age (Berry et al., 1984). Symptoms of BPH are caused by mechanical and dynamic obstruction of urine flow. The mechanical obstruction is due to compression or intrusion into the urethra by the enlarging nodule of the prostate or by protrusion of The median lobe of prostate into the bladder neck and leading to higher bladder outlet resistance. Dynamic obstruction is caused by increasing muscle tone of the bladder neck and prostate, which is regulated by a-adrenergic receptor (Caine et al., 1975). A reduction tone might be expected to reduce prostatic urethral pressure and to improve obstructive symptoms. Benign Prostatic Hyperplasia (BPH) is associated with obstructive symptoms (like hesitancy, decrease force and narrow stream, sensation of incomplete bladder emptying, double voiding, straining to urinate, post void

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dribbling) and irritative symptoms (like urgency, frequency, nocturia) which may be troublesome to an elderly men.

The self-administered questionnaire developed by the American Urological Association (AUA) is both valid and reliable in identifying the need to treat patients and in monitoring their response to therapy (Barry et. al 1992). The IPSS symptom score questionnaire is perhaps the single most important tool used in the evaluation of patients with BPH.

The International Prostate Symptoms Score (IPSS) initiated the guideline panel for diagnosis and management of benign prostatic hyperplasia. Patients with mild symptoms (having a score of 0 to 7) were assigned to watchful waiting, those with moderate (8 to 19) or sever (20 to 35) symptoms would undergo farther testing and/ or treatment. The IPSS-7 symptom index is not diseases specific.

Transurethral resection of prostate (TURP) aimed at reducing the symptoms experienced by patients and their effects on quality of life (QOL). Quality of life measures are important because the same symptoms are not equally bothersome for all patients: getting up three times a night patient may have a significant impact on quality of life, whereas another patient may not find this a problem. Hence patient- reported symptoms must be supplemented by measures of their perception on quality of life (Luckacs et al., 1993).

There are many options for treatment of symptomatic BPH like watchful waiting, medical therapy with a a-receptor blocker and 5a-reductase inhibitor, phytotherapy and surgical treatment including minimally invasive therapy. Symptoms are best assessed by IPSS and peak urine flow (Q_{max}) rate and quality of life Score (Chapple, 1995). Watchful waiting should be considered when a symptom in mild (0-7). Medical treatment is usually chosen, when there are moderate symptoms and no absolute indication for surgical intervention (Abrams et al., 1997). Medical treatment is cost effective, time consuming, sometimes patients forget to take medicine regularly, co-morbidity increased, unwanted adverse effect (like postural hypotension, headache, dizziness etc.), total symptoms free not possible, chance of progression of disease.

Indication for surgical intervention are: failed medical treatment of BPH. and complications of an obstructing prostate- such as acute or chronic urinary retention, recurrent urinary tract infection, haematuria, bladder stone and postrenal azotemia. The most common reasons that intervention is recommended in a patient with symptoms of bladder outlet obstruction and irritability are that symptoms are moderate to sever, bothersome and interfere with the patients quality of life. 90% of patients under going a TURP had symptoms of prostatism, but 70% had another indication as well (eg. acute urinary retention) occurring in 27% (Mebust et al., 1989).

A surgical approach when indicated may reduce urinary symptoms, thus restoring a good quality of life (Sagnier at al., 1995).

As life expectancy increase in Bangladesh so, lower urinary tract symptoms due to benign prostatic hyperplasia also increasing. Treansurethral resection of prostate (TURP) is still considered as a gold standard treatment option for benign prostatic hyperplasia (BPH). So it is important to determine the impact of TURP on symptoms related to BPH.

Study Methods : This study is prospective study carried out between 2010 and 2011 in the department of Urology, National Institute of Kidney Diseases & Urology. Total 102 cases were selected purposively according to selection criteria with prostatic volume of >50 mL from the patients attending urology out patient department with lower urinary tract symptoms due to BPH. Each of the patient was followed up at 8 weeks (1^{st} visit), 16 weeks (2^{nd} visit) 24 weeks (3^{rd} visit).

Before TURP for base line study of each patient was evaluated by history, physical examination, digital rectal examination (DRE), International Prostate Symptoms Scoring (IPSS), Quality of Life Scoring (QOL) Urinalysis, volume of the prostate and post voidal residual urine (PVR) were determined by ultrasonogram.

Digital rectal examination was done to determine the prostate size and to exclude carcinoma prostate. Perinal sensation, anal tone and bulbocavernosus reflux were observed to detect any neurological lesions.

Urinalysis, if needed culture and sensitivity. Prostate specific antigen, serum creatinine were done in the same laboratory of NIKDU and out side reliable pathological laboratories to exclude urinary tract infection, carcinoma prostate and renal failure respective. Transabominal USG was done by the sonologist (Radiology Department, NIKDU and reliable out side Laboratories) to detect any hydronephrotic change, Post voidal residual urine, prostate size, echotexture, any hypoechoic lesion in

the prostate. Uroflowmetry was done with a voided volume of >200 mL. Plain x-ray KUB region was done to exclude urinary stone diseases cases, neuropathic bladder was excluded from the study.

All history and examination followed a similar protocol. Informed consent was taken from all patients. A detail data sheet was completed and this included particulars of the patient- history, results of physical examinations and relevant base line investigations. From the supplied sheet IPSS Symptoms Score and QOL score were determined (Salam, 1999).

Each patient was observed and followed up at 8 weeks (1st visit), 16 weeks (2nd visit) 24 weeks (3rd visit) after transurethral resection of prostate (TURP). On each follow up visit, each patient was evaluated by history to find out incontinence, retrograde ejaculation (Dry Coitus). IPSS score, QOL score also recorded and uroflowmetry was done to see the peak urinary flow rate (Q_{max}) of urine and voiding time. USG was done to see post voidal residual urine volume and DRE also done in selected cases. Improvement of lower urinary tract symptoms and quality of life was determined using IPSS score.

Improvement was based on the changes from base line in symptoms, urinary flow rate, amount of post voidal residual urine and quality of life. Urine flow rate was measured by uroflowmetry as peak urinary flow rate (Q_{max}), voding time and voided volume and was considered valid only if the voided volume was >200 ml.

Symptoms were assessed urinary IPSS & consisting of seven symptoms (frequency, nocturia, urge in continence, urgency, hesitency, terminal dribbling and sense of incomplete evacuation) that were graded from 0-5. An overall symptoms score was calculated.

Data was collected in a pre-designed and pre-tested data collection sheet. Data was complied and statistical analysis were done using computer based software, Statistical Package for Social Science (SPSS), using paired 't' test. A P value <0.05 was taken as significance.

Results

A total 102 cases were selected consecutively according to selection and exclusion criteria from the patients attending urology out patient department of Dhaka Medical College Hospital, Dhaka with lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH). 102 cases were evaluated by history, physical examination, digital rectal examination (DRE), international prostate symptom scoring (IPSS), quality of life (QOL) scoring, uroflowmetry, post voided residual urine (PVR) and volume of prostate by USG and serum prostate specific antigen (PSA).

None of the patients had a prostatic nodule or solid lesion suspicious for prostatic cancer on the DRE, USG shows no hypo-hypercohoic lesions of the prostate.

The mean size >50ml and all specimens showed benign adenomutous tissue. The mean operative duration was 50 (40±75) minutes.

Cases were selected between 60-75 years. In group-A, among 42 cases (41.2%) ≤65 years and group-B, 60 cases (58.80%) > 65 years. Age of the patients of each group was compared with IPSS, PVR and Q_{max}.

Table-I

Changes in IPSS from base line to end point after TURP (n=102)

IPSS	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	21.61±2.43	4.27±1.71	82.508	101	<0.001
Range	17-25	0-7			
Change Mean±SD		-17.33±2.12			

Paired Student 't' test.

Before TURP, IPSS range 17-25 and mean 21.61±2.43, after TURP, range 0-7 and mean 4.27±1.71). There was significant correlation between the IPSS obstructive scores and Qmax at base line (P=<0.001), while correlations at the 1st, 2nd and 3rd follow up significant. There was also a significant correlation between IPSS obstructive score and PVR, and quality of life.

After TURP, the IPSS Score showed significant improvements in urinary symptoms with the IPSS showing more significant change for obstructive symptoms.

Hence a significant improvement of IPSS was found from 2 months to 6 months follow up after TURP. The change was tested using "paired student 't' test".

Table –II

Change in peak urine flow (Q_{max} from base line to end point after TURP.

Q_{max} (ml/sec)	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	9.96±1.69	22.61±2.28	-47.512	101	<0.001
Range	7 12.2	18 25			
Change Mean±SD		12.64±2.69			

Paired Student 't' test.

Before TURP Q_{max} range 7-12.2 and mean was 9.96±1.69, which became range 18-25 and mean was 22.61±2.28 after TURP and therefore change of mean Q_{max} was 12.64±2.69.

TURP caused a significant change in Q_{max} the mean Q_{max} being 12.64±2.69 ml/sec and mean PVR range >100 ml. The mean (SD) improvement in Q_{max} was 12.64±2.69 ml/sec and reduction in PVR, 60 patients having no detectable PVR at the 6 months follow up.

The change was tested using "paired student 't' test". The change was found significant (P<0.001).

Table-III

Changes in voiding time from base line to end point after TURP (n=102).

Voiding time (Sec)	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	54.65±7.09	21.08±1.86	45.030	101	<0.001
Range	40-45	20-25			
Change		-33.57±7.53			

Mean±SD

Paired Student 't' test.

Mean voiding time was 54.65±7.09 sec at base line, which became 21.08±1.86 sec at end point and therefore change of mean voiding time was -33.57±7.53 sec.

Hence a significant improvement of voiding time was found after transurethral resection of prostate (TURP). The changes was tested using 'Paired student 't' test'. The change was found significant (P=<0.001).

Table- IV

Change in PVR from base line to end point after TURP (n=102).

PVR (ml))	Baseline (before TURP)	Endpoint (after TURP)	t	df	P value
Mean±SD	205.27±14.76	4.07±8.92	147.075	101	<0.001
Range	180-220	0-5			
Change		-201.21±13.82			
Mean±SD					

Paired Student 't' test.

Mean PVR was 205.27±14.76 ml at base line, which became 4.07±8.92 ml at end point and therefore change of mean PVR was -201.21±13.82 ml.

Hence a significant reduction of PVR was found after TURP. The change was test using 'Paired Student 't' test'. The change was found significant (P=<0.001).

Discussion

Recently most of the urologist in our country has been using this surgical method, transurethral resection of prostate of BPH. This present study was done to determine the improvement of symptoms and peak urinary flow rate (Q_{max}) after transurethral resection of prostate. In this study 102 patients of benign prostatic hyperplasia (BPH) from out patient department of urology of NIKDU were selected for transurethral resection of prostate (TURP) and were followed up 2 monthly for 6 months to determine the improvement of IPSS, peak urine flow rate (Q_{max}).

In this study, all cases were purposively selected from out patient department of urology of Dhaka Medical College Hospital age ranging from 60 years to 75 years who has been suffering from lower urinary tract symptoms due to benign prostatic hyperplasia. The age ranges of the separate study done in 1999 and 2000, 60 men with mean age 68 years and had a diagnosis of lower urinary tract symptoms suggestive of BPH (Gacci et. al., 2003).

Another study was done to assess the necessity for routine out patient review following transurethral resection of prostate (TURP) for BPH. 102 patients with histologically proven benign prostatic hyperplasia were prospectively reviewed as out-patients. During a 6 months period from October 1992 to March 1993, 102 consecutive patients (mean age 71 years, range 54-92) attending the out patients department following TURP. 90% of patients expressed satisfied with the results of their operation, 4% were dissatisfied and 6% felt there had been little improvement. Of 8 patient given further out patients department appointment.

After transurethral resection of prostate IPSS scores was showed significant improvements in urinary symptoms.

Effect of TURP was again observed in a separate study by evaluating change of IPSS before TURP irritative mean 6.71; obstructive mean 9.69 and after TURP became irritative 3.06 and obstructive 3.38, showed significant improvement in urinary symptoms with the IPSS for obstructive symptoms than for irritative symptoms or quality of life (QOL) (Gacci et al., 2003). These results are similar with the results of present study.

A significant improvement of Q_{max} was found after transurethral resection of prostate (2 months, 4 months and 6 months follow up) in this study.

Prostatectomy caused a significant change in Q_{max} the mean Q_{max} being 26.1 (14.5-41.2)ml/sec. The mean (SD) improvement in Q_{max} was 17.9 ml/sec at 6 month follow up (Gacci et al., 2003).

Another study included 108 men with symptoms of bladder outlet obstruction using a peak flow rate ≤12ml/sec as an index of obstruction, 65 patients were identified. A flow rate alone was accurate in 95% of cases with 62 patients being obstructed on urodynamic evaluation; 43/108 patients (40%) had flow rate >12 ml/sec. Of 53 patients with outflow obstruction as defined by cystometry who agreed to undergo TURP, 37 (69%) returned 1 year later for a repeat free flow rate and symptomatic assessment. No patient with residual symptoms had a flow rate <12ml/sec at follow up. None of the patients with initially higher flow rates underwent TURP were noted to have residual symptoms at follow up. All patients in this study had improved flow rates compaired with preoperative measurements (Loughlin et. al., 1990).

Hence a significant improvement of voiding time was found after TURP. The change was found significant (P=<0.001). Similar reduction in voiding time also observed in a study on 108 patient with lower urinary tract symptoms due to BPH (Loughlin, Gill KP., et. al., 1990). These results are also consistent with the present study.

A significant reduction of PVR was found after TURP in this study. The change was found significant (P=<0.001).

In a study it was observed 60 men with BPH; prostatectomy caused a significant change in Qmax being 26.1 (14.5-41.2) ml/sec and the mean PVR (0-50) ml. The mean (SD) improvement in Qmax was 17.9 ml/sec and reduction mean PVR 92 ml with 39 patient having no detection PVR at the 6 month follow up (Gacci et. al., 2003). Results of this study are also similar with the present study.

Conclusion:

From the present study it can be concluded that transurethral resection of prostate resolves obstructive symptoms, rapid improvement of urinary flow rate and quality of life that is why it is gold standard treatment for moderate to severe symptomatic BPH patients.

Conflict of Interest : None Declared

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Abbreviations:

BPH: Benign Prostatic Hyperplasia

IPSS: International Prostate Symptoms Score

Q_{max}: Peak Urinary flow rate

PVR: Post voidal residual Urine

TURP: Transurethral Resection of Prostate