ROLE OF ABDOMINAL ULTRASOUND IN EVALUATING PATIENTS WITH URINARY RETENTION DUE TO BENIGN PROSTATIC HYPERPLASIA

MANZOOR T., SHAHID K., IBRAHIM M. AND WARIS N.A.
FMH College of Medicine and Dentistry, Lahore – Pakistan

ABSTRACT

Background and Objectives: Urinary Retention (UR) is one of the most serious complication of benign prostatic hyperplasia (BPH), causing resistance in urine flow and hence results in painful urination. Ultrasound is considered as modality of choice as a non-invasive method for imaging prostate gland. The objective of this study was to find out the frequency of patients with urinary retention due to benign prostatic hyperplasia and also to determine association between age and prostate volume.

Methods: In this study 53 patients were evaluated at Fatima Memorial Hospital Lahore, who came with urinary retention due to enlarged prostate gland as result of benign hyperplasia. By a simple non-invasive method based on Pre and post void bladder volume and prostate volume using abdominal ultrasound. Prostate volume was divided in to three grades accordingly.

Results: Sixteen (16) patients did not require any management whereas 34 patients were managed by catheterization and 3 had to undergo surgery.

Conclusion: Abdominal ultrasound is an effective modality to evaluate prostatic enlargement which is commonly seen in past fifty years of age.

Key words: Ultrasound, urinary retention, benign prostatic hyperplasia, bladder obstruction, prostate volume.

INTRODUCTION

Hyperplasia is a general pathologic term referring to an abnormal increase in the number of cells. Benign prostatic hyperplasia (BPH) is non-cancerous cell growth of the prostate gland. It is the most common non-cancerous form of cell growth in men and usually begins with microscopic nodules in younger men. Fifty percent of men aged 51 to 60 and over 90% in men older than 80 years presented with lower urinary tract symptoms due to BPH.[1] Symptoms that are also termed as Lower Urinary Tract Symptoms (LUTS) are generally classified as either *voiding* (obstructive) symptoms or *storage* (irritative) symptoms Patients with BPH may present with urinary retention (UR) which is a common urological emergency for hospital admission. These patients are usually immediately managed by urethral catheterization. Some with higher severity undergo prostatectomy which was considered as gold standard management.[2]

The management of patients with BPH has undergone rapid change in the last few years as a result of better understanding of the natural history of BPH and the easy availability of ultrasound. The prevalence of histologic BPH in autopsy studies rises from approximately 20% in men aged 41 – 50, to 50% in men aged 51 – 60, and to > 90% in men older than 80. Although clinical evidence of disease occurs less commonly, symptoms of prostatic obstruction are also age related. At age 55, approximately 25% of men report obstructive voiding symptoms. At age 75, 50% of men complain of a decrease in the force and caliber of their urinary stream.[3] The actual size of the gland does not necessarily predict symptom severity. Some men with minimally enlarged prostate glands may experience symptoms while other men with much larger glands may have few symptoms. BPH is very common among older men, affecting about 60% of men over age 60 and 80%

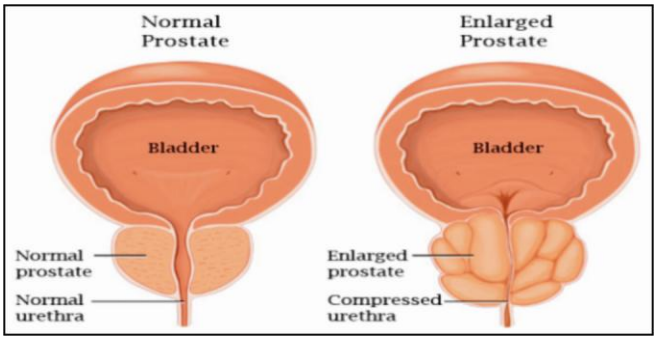

Fig. 1: *Normal and Enlarged Prostate.*

Corresponding Author: Dr. Tariq Manzoor, Assistant Professor/HoD Medical Imaging Technology FMH CM&D, Shadman Lahore
Mob: 0300-4634231. Email: tariq_manzoor2001@yahoo.com

of men over age 80 years. BPH is often, but not always, the cause of LUTS, especially the voiding symptoms.[4] That include:

- Hesitation before urine flow starts despite the urgency to urinate.
- Straining when urinating.
- Weak or intermittent urinary stream.
- Sense of in-emptiness.
- Post-dribbling.

In our clinical practice trans-abdominal ultrasound of KUB and prostate is routinely done to assess the patients with lower urinary tract symptoms (LUTS) due to BPH.

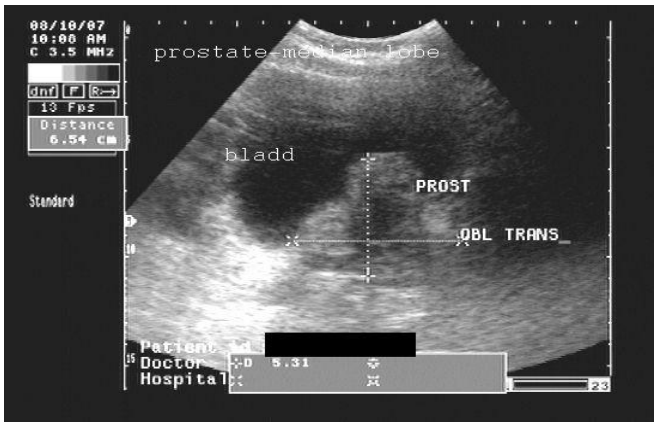

Fig. 2: *Abdominal Sonographic Presentation of BPH.*

The objective of this study was to find out the frequency of patients with urinary retention due to benign prostatic hyperplasia and also to determine association between age and prostate volume.

METHODS

Between July 2015 and December 2015, a total of 53 patients with primary symptom (urinary retention) of benign prostatic hyperplasia were included in this study. This study was carried at Department of Radiology: Fatima Memorial Hospital, Lahore. Patients with urinary retention due to BPH between ages 50 and 80 were included in this study. Whereas patients with prostatic cancer, recurrent or chronic urinary retention due to any other reason, urinary tract infections, bilateral hydronephrosis, renal impairment, or neurological diseases were excluded. History taking and physical examination were done in all cases to ensure further specificity. Trans-abdominal ultrasound was done to assess prostatic volume along with pre and post-void residual volume. Bladder filling was ensured to get complete pre-void bladder volume and to get acoustic window for visualizing prostate gland. Prostatic volume was categorized in group ranges by measuring the prostate anteroposteriorly and circumference prostate diameter.

Patients were divided into three groups according to Prostate volume. Ranges were made as follow: Group 1; 30 – 39, Group – 2; 40 – 49 and Group – 3; 50 – 59 respectively. The age of patients was also categorized in groups as: Group – 1; 51 – 60, Group – 2; 61 – 70 and Group – 3; 71 – 80.

Data were analyzed using SPSS V – 21. Categorical variables were expressed in the form of frequencies. Bar charts were used to display the data. Chi-square test was used to find association between age group and prostate volume groups, a P value of < 0.05 was considered statistically significant.

RESULTS

A total of 53 patients were recruited for study. The mean age of the patients was 65 years. With mini-mum age 51 and maximum was 80. Age of patient was divided in three groups (Table 1).

The mean value of Bladder Volume was found to be 536.32 ml and Post-Void Residual Volume was

Table 1: *Distribution of patients according to age (n = 53).*

Age in Groups	*Frequency*	*Percentage*
51 – 60	21	39.6%
61 – 70	14	26.4%
71 – 80	18	34.0%

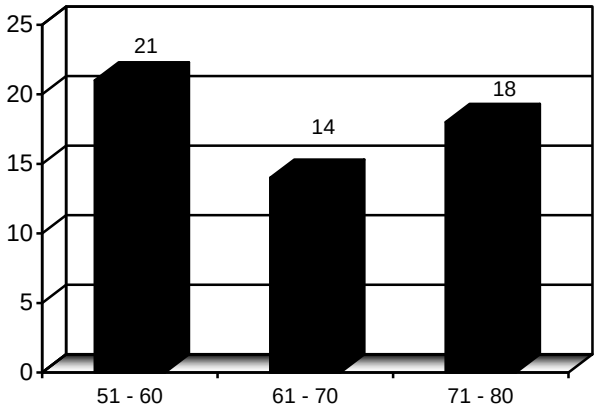

Fig. 3: *Distribution of patients according to age.*

Table 2: *Distribution patients according to prostate volume (n = 53).*

Prostate Volume in Groups	*Frequency*	*Percentage*
30 – 39	14	26.4%
40 – 49	20	37.7%
50 – 59	19	35.8%

102.55 ml, with the minimum value of 440 and maximum of 610 ml for pre-void whereas minimum of 40 and maximum of 170 ml for post-void residual volume. Prostate size was also divided in three groups (Table 2).

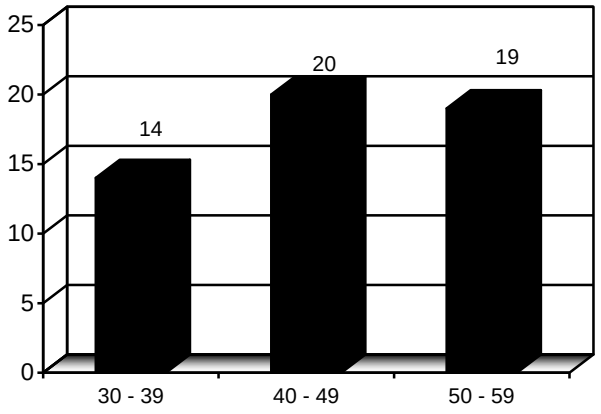

Fig. 4: *Distribution patients according to prostate volume.*

The mean size of Prostate Gland in 53 patients, with Benign Prostatic Hyperplasia was 46, with the minimum value of 31 and maximum value of 59. Out of 53 patients, 16 patients were left unmanaged, whereas 34 were put on catheterization for urinary retention management and 3 were such cases in which surgery was the only option for management of urinary retentoion (Table 3).

Table 3: *Management advised.*

Management	*Frequency*	*Percentage*
No management	16	30.2%
Catheter	34	64.2%
Surgery	3	5.7%

The cross tabulation of age group and prostate volume group is given in table 4. Age has a significant association with prostate size ($p < 0.05$).

Table 4: *Cross – tabulation of age and prostate size.*

		Age in Groups		
		51 – 60	61 – 70	71 – 80
Prostate Groups	30 – 39	12	2	0
	40 – 49	5	12	3
	50 – 59	4	0	15
Total		21	14	18

DISCUSSION

Acute urinary retention due to BPH is a common urological emergency.[1] However there is no consensus on the management of this urological emergency.[3] At some centres, catheterization is done to relieve the spontaneous voiding emergency while at others an episode of ARU is an indication for prostatectomy.[4] As the prostate size is a predictive indicator for management.

This study is similar to a previous study by Tan et al[6] and later by Gupta et al[7] with addition of age as an important factor for BPH. In this study it is noted that the greater the intravesical protrusion, the more severe the obstruction. Grade 3 patients are more likely to have recurrent urinary retention. On the other hand 9 patients (60%) with a grade 1 prostate achieved successful TWO Cata follow-up of up to one year.

In this study the major variables were prostate size, pre and post-voidal bladder volume and age. The mean value of the prostate size was 45.92 with minimum of 31 and max of 59 which is in agreement as reports by Gupta.[3] Also there was significant association between age and prostatic volume.

It is ***concluded*** that Post-voiding measurement can easily be obtained with trans-abdominal ultrasound scan in the outpatient department to evaluate patient with UR due to BPH. Considering the findings of the present study and the study which correlates with this study it can be concluded that PV is a useful clinical predictor for evaluating the success of voiding trial following UR. The degree of PV influences the outcome. PV can be used to direct the appropriate patients to more aggressive treatment strategies such as surgery.

Ultrasound is a modality of choice for evaluating patients with BPH, it helps in diagnosis as well as prediction of the management for urinary retention, and age has a significant factor in BPH.

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Authors' contribution

T.M.: Main idea, directions and write up of article. K.S.: Synopsis development, data analysis. M. I.: Result calculations and writing of results. N.A.W.: Investigator/data collection and preparation of manuscript.

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