

Correlation between Symptomatology, Digital and Sonographic Prostatic Size with Post Voidal Residual Urine in Benign Prostatic Hyperplasia

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Abstract

This Prospective study included 100 patients having urinary complains studied under the Department of General Surgery, M.P. Shah Medical College, Jamnagar from October 2017 to December 2018. Commonest in 50-75 years of age, burning micturation (45%) was the most common complain followed by lower abdominal pain (35%), urinary retention (21%). Hematuria (17%). Symptoms included nocturia (96%), increase in urinary frequency (84%), straining during urination (71.0%), weak stream during urination (84.0%), urgency (95.0%), incomplete emptying (81.0%) and intermittency (86.0). Most of the subjects presented with moderate severity of symptoms (42%) belonged to 50-75 years of age group. DRE revealed, prostatic size normal (13%), +1(57%), +2 (30%). Median sulcus obliterated (24%), overlying mucosa fixed (8%). Consistency was firm (86%), elastic (8%) and nodular (6%). IPSS Score - mild (19%) moderate (73%) and severe (8%). (2%) had prostatic volume <20cc, (20%) between 21-30cc, (38%) between 31-50cc, (33%) between 51-80cc, (7%) >80cc. Average MLP for prostatic <20 cc is 1.1 cm, 21-30 cc is 1.04 cm, 31-50 cc is 1.326 cm and 51-80 cc is 1.65 cm. Average PVRU for prostate < 20 cc is 5cc, 21-30 cc is 19.8 cc, 31-50cc is 32.05cc, 51-80 cc is 44.59 and > 80 cc is 69.86 cc. The person's coefficient of correlation between the sonographic prostatic size and PVRU $r_1=0.54072$ and between IPSS with PVRU $r_2=0.681461$

Keywords: Benign Prostate Hypertrophy; Digital Rectal Examination (DRE); Post Voidal Residual Urine (Pvru); Median Lobe Projection (MLP)

Introduction

Benign prostatic hyperplasia (BPH), also called benign enlargement of the prostate (BEP or BPE), is a noncancerous increase in size of the prostate. BPH is characterized pathologically by the abnormal proliferation of cells (hyperplasia) in the transition zone, leading to structural changes accompanied by the formation of nodules, which can consist of stromal tissue (i.e. involving undifferentiated mesenchymal cells [mesenchymal hyperplasia], fibroblasts [fibroblastic hyperplasia], smooth muscle cells [leiomyomatous hyperplasia], and fibromuscular stroma [fibromuscular hyperplasia] or glandular tissue [glandular hyperplasia] [1].

When sufficiently large, the nodules push on and narrow the urethra resulting in an increased resistance to flow of urine from the bladder. This is commonly referred to as "obstruction", although the urethral lumen is no less patent, only compressed. Resistance to urine flow requires the bladder to work harder during voiding, possibly leading to progressive hypertrophy, instability, or weakness (atony) of the bladder muscle. If BPH causes obstruction of the bladder and remains untreated, complications such as recurrent urinary tract infections, bladder stones, and chronic kidney disease (potentially leading to kidney failure) may ensue.

The assessment of prostate includes detailed

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analysis of symptomatology, digital rectal examination for assessing lateral lobe enlargement and ultrasonography for measurement of median lobe. But all these methods assess the size of prostate while the effect of this increase in size on bladder outflow will be indirectly yet effectively assessed by post voidal residual urine measurement by sonography. It is this volume of post voidal residual urine that governs the treatment and not just the size of prostate.

Precisely, thorough study of symptoms with its severity, digital per rectal examination and ultra-sonographic findings may be tools enough to establish a final diagnosis of Benign Prostatic Hyperplasia with ease and at lower cost so that the plan of management can be decided and dreaded complications may be avoided.

Aims of Surgery

1. To study various symptoms and signs associated with Benign prostatic hyperplasia.
2. To study the methods, clinical and sonographic, used for the estimation of prostatic size in benign prostatic hyperplasia.
3. To study the relationship between lower urinary tract symptoms and estimated prostatic size via digital rectal examination and sonographic estimation.
4. To correlate the assessment of prostatic size with the effect of increase in size by analyzing post voids residual urine.

Material and Methodology

This Prospective study included 100 patients having urinary complains visiting G.G. Hospital Jamnagar studied under the Department of General Surgery, M.P. Shah Medical College, Jamnagar during period of October 2017 to December 2018. In this study symptomatology, digital rectal examination and ultra sonographic investigation to be done.

Sample size: 100 patients

Inclusion criteria

- Incomplete emptying
- Frequency
- Intermittency
- Urgency
- Weak Stream

- Straining
- Nocturea
- Retention of urine
- Hematuria
- Others associated complains like burning micturition and lower abdominal pain

Exclusion criteria

- Those who do not give consent
- Patients who are confirmed case of prostratic carcinoma.
- Patients who have undergone any urosurgery for obstructive symptoms in the past are excluded from the study.

Results

During study period 100 patients with urinary complains were studied for symptomatology, Prostatic size sonographically and by per Rectal examination the mean age of the patients was 65.49 years. The most common presenting IPSS-LUTS was nocturia in 96 patients (96%) followed by increase in urinary frequency in 84 patients (84%), straining during urination in 71 patients (71.0%), weak stream during urination in 84 patients (84.0%), urgency in 95 patients (95.0%), incomplete emptying of bladder in 81 patients (81.0%) and intermittency in 86 patients (86.0%) (Fig. 1). Most of the patients had moderate symptoms (42%) on IPSS (Fig. 2). Out of 100 patients, Sonographically the Prostatic volume <20 ml seen only in 1 patient, 21-30 ml seen in 10 patients, 31-50ml seen in 36 patients, 51-80ml seen in 39 patients, >80ml seen in 14 patients. Digital Rectal Examination showed, prostatic size normal in 13 patients (13%), +1 prostate seen in 30 patients (30%), +2 prostate seen in 57 patients (57%) (Figure - 3). Median sulcus obliterated seen in 24 patients (24%), palpable in 76 patients (76%). Overlying mucosa fixed in 8 patient (8%) free in 92 patients (92%). The consistency was found to be firm in 86 patients (86%), elastic in 8 patients (8%), nodular in 6 patients (6%). 19% had a mild IPSS Score, 73% had a moderate IPSS score and 8% had severe IPSS score (Fig. 4). Moreover only 2% of the subjects had prostatic volume below 20cc, 20% of the subjects had prostatic volume between 21-30cc, 38% of the subjects had prostatic volume between 31-50cc, 33% of the subjects had prostatic volume between 51 to 80 and 7% of the subjects had prostatic volume >80cc. Average median lobe projection for prostatic

size <20 cc is 1.1 cm, 31-50 cc prostatic volume has a median lobe projection of 1.326cm and 51-80 cc prostatic volume has a median lobe projection of 1.65 (Table 1). A study of average values of post void residual urine as per distribution of prostatic volume reveals that average value for post void residual urine for prostatic volumes < 20 cc is 5cc, 21-30 cc is 19.8 cc, 31-50cc is 32.05cc, 51-80 cc is 44.59 and >80 cc is 69.86 cc (Table 2). It is obvious that the post void residual urine is increasing with the increase in the prostatic volume.

Table 1: Correlation between prostatic volume and median lobe enlargement (n=100)

S.No.	Prostatic Volume (ml)	Average Median Lobe Projection (cm)
1	<20	1.1
2	21-30	1.04
3	31-50	1.326
4	51-80	1.65
5	>81	2.178

Table 2: Correlation between prostatic volume and post void residual urine. (N=100)

S.No.	Prostatic Volume (ml)	Average Post Void Residual Urine (ml)
1	<20	5
2	21-30	19.8
3	31-50	32.05
4	51-80	44.59
5	>81	68.86

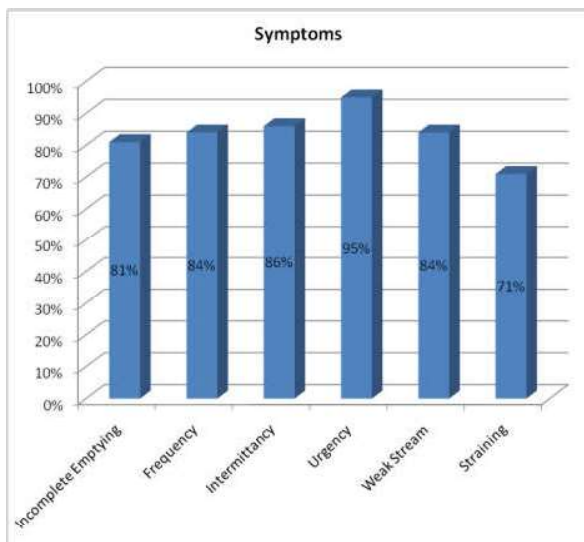


Fig. 1: Distribution of important obstructive and irritative symptoms in the subjects (n=100)

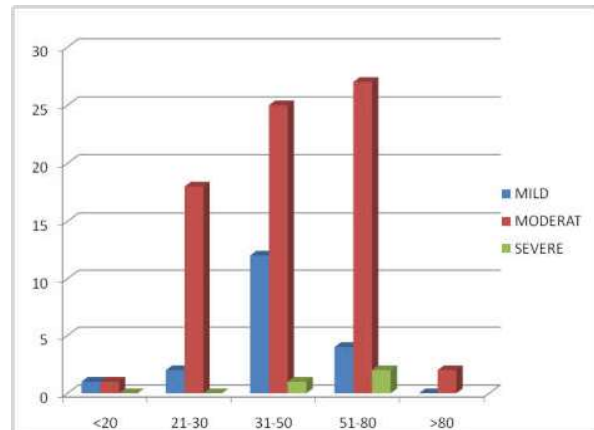


Fig. 2: Correlation between ipss and prostatic volume (n=100)

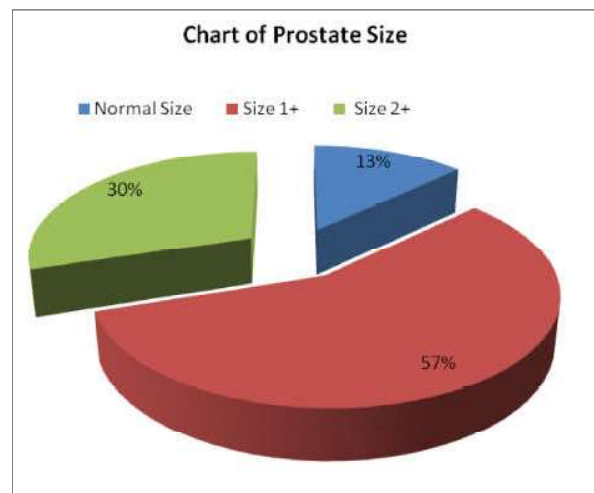


Fig. 3: Prostatic size by digital rectal examination (n=100)

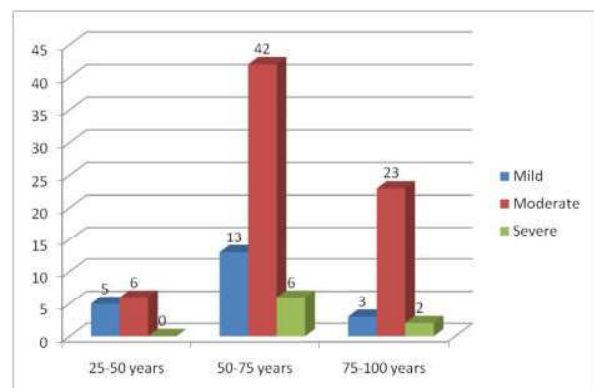


Fig. 4: Age wise distribution of severity of symptoms based on the ipss score of the subjects (n=100)

Discussion

LUTS can be due to mechanical obstruction to urine flow or due to bladder hypo-contraction. These patho physiologic elements are all common in the elderly and may be present alone or in combination [2]. LUTS-BPH consists of BPE, BOO, and LUTS. However, patients with LUTS-BPH do not always share these components and as such they do not show similar degree of symptoms [3]. Factors such as dynamic urethral resistance, prostate capsule, and anatomic pleomorphism rather than actual Prostate size can influence severity of symptoms [4]. It is therefore imperative that patients with LUTS be properly investigated and categorized based on the cause of LUTS. Objective symptom assessment using various symptom scoring systems, such as IPSS, uroflowmetry, and urodynamics, have proved very useful tools in the assessment of patients with LUTS-BPH before definitive treatment.

This study showed that most of our patients (42%) presented with moderate IPSS scores. The most common symptom of LUTS from this study was nocturia (96%) followed by urgency to pass urine (95%), urinary frequency (81%) and straining to pass urine (71%). A study of Nnamdi azikiwe University symptoms among Europeans showed that the most common symptom was nocturia (100%) similar to our finding, followed by incomplete emptying (39.2%) and urgency (41.2%), weak urinary stream (84%), and urinary frequency (98%).

In our study when the pearson's coefficient of correlation is calculated between the sonographically calculated prostatic size and the post void residual urine where the value of $r=0.54072$ which is suggestive of a moderate uphill positive linear correlation between the two studied parameters which is in concordance with the study by Martha K. Terris, Naveed Afzal, and John N. Kabalin, Adult Urology [5].

Conclusion

Benign Prostatic Hyperplasia is one of the most common condition affecting elderly males, its incidence proved to be increasing with the rise in the age of the individual. Early and close clinical diagnosis can be established by closely studying the patients complains along with its severity in relation to his age and then correlating them to the clinical finding of digital per rectal examination. This clinical diagnosis may then be reinforced by ultrasonographic examination involving detection of prostatic volume, median lobe projection and post void residual urine to come to the final diagnosis. Adequate therapy may help in prevention of urinary infections causing complications like burning micturition lower abdominal pain flank pain, urinary retention and in worst conditions hematuria.

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