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Study of Clinical Evaluation of Lower Urinary Tract Symptoms Due to Benign Prostatic Hyperplasia

[1]Dr. R. G. Naniwadekar, [2]Dr. Ritesh Kumar Singh
[1] *Professor, Department of Surgery Krishna Institute of Medical Sciences, Karad-415110, Maharashtra*
[2] *Department of Surgery Krishna Institute of Medical Sciences, Karad-415110, Maharashtra*

ABSTRACT

Benign prostatic hyperplasia (BPH) is a non-infectious (subconscious) enlargement of the prostate gland, usually found in older person. BPH can be differentiated from cancer of the prostate. Prostate cancer can cause BPH like symptoms, but is normally correlated with an rise in PSA and enlarged prostate on rectal inspection. It was a prospective observational longitudinal study conducted among 84 cases of LUTS due to BPH attending department of general surgery in a tertiary health-care centre during December 2016 to June 2018. Patients diagnosed to have LUTS due to BPH were assessed according to IPSS questionary. Majority of the cases with BPH in our study belonged to age group of 61-70 years(42.85%), We calculated IPS Score according to clinical presentation of cases. We observed 60.71% cases of moderate symptomatic IPS Score, followed by 39.28% cases with severe symptomatic IPS Score. There is no direct proved one to one correlation between prostatic volume and severity of LUTS

Keywords: Hyperplasia, Prostate gland, Hemostasis, LUTS, BPH, Prostatic

Correspondence:
R. G. Naniwadekar
Professor, Department of Surgery
Krishna Institute of Medical Sciences
Karad, Maharashtra

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INTRODUCTION

Benign prostatic hyperplasia (BPH) is the nonmalignant enlargement of the prostate gland. The International Prostate Symptom Score (IPSS) is a tool which is very commonly used in the evaluation of the severity of symptoms of the patients. It is a self-administered questionnaire which scores the symptoms the patient has experienced over for the preceding 4 weeks. This questionnaire has been validated by numerous researchers in well-educated patients. It helps the clinician understand the severity of patient's symptoms and can guide treatment. The IPSS questionnaire can be difficult for an average patient to comprehend. Hence the responses can depend upon the level of education and understanding of the patient. This can have a significant bearing on the ultimate score and can lead to improper selection of treatment.[1-2] It can lead to significant distress both to the patient and to the treating physician due to the lack of optimum response by the treatment based on the IPS.[3]

The present dissertation was aimed at studying lower urinary tract symptoms in BPH and hence, correlate LUTS with IPSS scoring system.

AIM AND OBJECTIVES

AIM

To study the clinical evaluation of lower urinary tract symptoms due to benign prostatic hyperplasia.

OBJECTIVES

To clinically assess the grade of LUTS according to International Prostate Symptom Score (IPSS). To correlate severity of LUTS with prostatic volume measured on ultrasonography.

REVIEW OF LITERATURE

Benign prostatic hyperplasia has been known for several centuries to be a cause of urinary dysfunction. Diseases of prostate are as old as mankind itself. Words from Old Testament are one of the earliest references to urinary incontinence and retention. Benign prostatic hyperplasia (BPH) was mentioned in the Egyptians papyri as early as 1500 BC and was discussed by Hippocrates 100 years later. A recent study of aging among normal volunteers found a 51% clinical incidence of BPH.

The development of prostate surgery actually commenced during 19th century .The first ever mention of prostatic enlargement recorded in the book surgery by Roger (Ruggiero Frugadi) brought out by the Salerno school of Medicine in 1170 A.D. Here Roger mentions of a fleshy, soft mass obstructing the flow of urine which can be palpated by two fingers of right hand in the rectum.[4] In 1644, five centuries, later Roger Rialambue described the prostate and its enlargement causing obstruction to urine .The first detailed description of the pathology of the prostatic enlargement were published by Guthrie and John Hunter. In 150 A.D Galen[5] reported attempting to destroy urethral callosities by passing a catheter through the urethra. Subsequently improved method of hemostasis blood transfusion and antimicrobials assured safety of the procedure and led to its renowned popularity. To control bleeding, various devices were used. Watson in 1868 used galvocautery to control bleeding .Thompson Walker inserted single stitches at 4 and 8 o'clock position, passing through prostatic cavity thereby achieving haemostatic, contraction of operative site and primary closure of the bladder and operation wound. The first reference to suprapubic extravesical prostatectomy is the report by Van Stockum of Rotterdam in 1909. He used to take vertical incision over the prostate capsule for the enucleation of adenoma .He routinely used to pack the cavity with ribbon gauze which was removed after 24 hrs and he used to drain the bladder with a fairly thick rubber tube which was removed on the 5th day and urethral catheter was inserted for drainage of urine. Prostate surgery took a historic step forward when Terrence Millin described retropubic approach to the prostate. After this, he carried out this operation more than 375 times and published his monogram on Retropubic urinary surgery in 1947.

The retropubic operations performed now a day's adhere closely to the principles set forth by Millins with a few minor technical difference [6].

The Prostate

In the human male a fusiform fibro-muscular structure, supporting glandular tissue, is found in relation to the whole length of that part of the urethra which extends from the outlet of the bladder to the deep layer of the triangular ligament: this gland is known as the prostate.[7]

The prostate forms acini and collecting ducts by arborization that branches from the urethra, with growth occurring primarily at the tips of the buds as they extend and branch during development. The male fetus is dependent on androgens synthesized by the Leydig cells, which become activated during the second month of gestation and reach a peak secretory activity by the fourth month. With the withdrawal of maternal estrogen, a prostate involutional phase occurs during the first 5 months following birth.

GROSS ANATOMY

The normal adult human prostate weighs approximately 20 grams. It looks like a chest nut with its apex pointing downwards situated surrounding the first 3 cms of the urethra (prostatic urethra).

Mc Neal [8] has identified zones, rather than dividing the prostate into arbitrary lobes. These zones have morphological, functional, and pathological significance. Using Sagittal, coronal and oblique section he has divided the prostate into four distinct zones.

RELATIONS OF SURFACES

1) Base – Continuous with the bladder neck, with which it shares the smooth muscle linning with an intervening groove in which there are veins.

2) Apex – Rest on the upper surface of the superior layer of the urogenital diaphragm which also acts as external urinary sphincter. Adenomas of the prostate tend to grow upward in the bladder , this being the path of the least resistance .

3) Posterior – Rests on the anterior wall of the rectum separated from it by fascia of Denonvilliers .

4) Inferolateral – Related to and supported by that part of levator ani called levator prostatea.

5) Anterior – Behind symphysis pubis and connected with it by puboprostatic ligaments.

CAPSULE OF THE PROSTATE

It has two capsules True and Flase.

The false capsule (surgical) is formed around an area of adenomatous enlargement by condensation of prostatic tissue which is pushed to periphery of gland and adenoma can be shelled out of this compressed gland tissue.

The True capsule (anatomical) is condensation of visceral layer of the pelvic fascia which gives a common sheath enclosing bladder and gland.

FASCIA OF DENONVILLIERS

This is extension of the peritoneum behind prostate attached to prostate firmly. In the early fetus the peritoneum of the pelvic floor extends down as a pouch behind the prostate .The anterior of these two facial layers is firmly attached to prostate .The prostate layer is not quite so firmly blended with sheath of the rectum .The potential space between the two layers of fascia is the space of denonvilliers. It has got importance in the perineal prostatectomy.

RELATION OF THE PROSTATE WITH PROSTATIC URETHRA

This part of the urethra extends from the bladder to the external sphincter which lies between the two layers of the urogenital diaphragm .The middle lobe of the prostate projects normally into the urethra raising prominence on its floor crista urethralis or verumontanum.

The prostate gland drains into the prostatic sinus situated along the side of verumontanum .The ejaculatory ducts empty into the posterior urethra at the prostatic utricle situated at the apex of the verumontanum. When adenoma of the prostate enlarges, the verumontanum is pushed downwards towards the external sphincter.

NERVE SUPPLY

The prostatic plexus of nerve is derived from the lower part of the inferior hypogastric plexus. It contains thick nerves and numerous ganglia. The prostate is supplied by both sympathetic and parasympathetic nerves. The gland contain numerous end organ, impulses from which are relayed to the lower three lumbar and upper sacral segments. Secretions of the prostate are produced and discharged after stimulation of both parasympathetic and sympathetic nerves.

Prevalence and natural course of LUTS

BPH is the most common benign neoplasia in men. Lower urinary tract symptoms due to BPH are regarded as a chronic condition that increases in frequency and severity with age. In men 50 years or older in England, Scotland, and Wales, 41% described symptoms classed as moderate to severe, but only 18% reported that they had received a clinical diagnosis of BPH. Quality of life and general health status decreased as severity of symptoms increased; however, only about 1 in 10 respondents was aware of the availability of prescription drugs or surgical options for BPH. Storage and voiding symptoms were self reported by 51% and 26% respectively of men aged 39 and older from five European countries, with the prevalence of reporting increasing with age. Results from other national surveys suggest that despite being common and bothersome, lower urinary tract symptoms often go undiagnosed or untreated. Mild symptoms do not greatly affect quality of life, but the impact of severe symptoms is similar to chronic conditions such as hypertension, diabetes, angina, and gout.[9-11]

Differential diagnosis of LUTS based on IPSS voiding to storage ratio

The focus on LUTS has recently shifted from the prostate to the bladde. Several investigations suggest that not all male LUTS are associated with prostate pathology or BOO and bladder dysfunction plays a role in the pathogenesis. However, it is difficult to distinguish the causes of male LUTS based on clinical symptoms, and a subset of patients receiving treatment for prostatic conditions may have residual overactive bladder (OAB) symptoms. Although urodynamic pressure flow study is helpful in the differential diagnosis, the equipment is not available in every clinic. The pathophysiology of male LUTS could be bladder

dysfunction, (including hypersensitive bladder, detrusor overactivity [DO], detrusor hyperactivity and inadequate contractility [DHIC]), BOO (including bladder neck dysfunction [BND], prostatic obstruction, urethral stricture, poor relaxation of the urethral sphincter), or a combination of these etiologies. It has been estimated that only 48%–53% of men with LUTS have urodynamically-proven BOO due to BPH or other bladder outlet dysfunctions. In addition, approximately 50%–75% of patients with BOO have OAB symptoms, and 46 to 66% of patients with BPO on urodynamics have do.

Diagnosis of male LUTS /BPH and treatment algorithm

BPH is highly prevalent in older men. However, it has been estimated that only 25%–50% of men with BPH have LUTS, and only 50% of men with LUTS have urodynamically-proven (BOO) due to BPH or another bladder outlet dysfunction. Previous studies have shown weak correlations of LUTS with prostate size, uroflow measures and pressure flow study data. Nevertheless, the AUA-SI was found effective in predicting BPH progression to surgery.

The symptom score is better for quantifying symptoms for the evaluation of BPH treatment than for diagnosis of BPH. Although BPH is one of the most common diseases in elderly men, not all LUTS are caused by BPH. BPH with BOO was only found in one third of a cohort of patients with both storage and voiding LUTS. In fact, LUTS can be the clinical presentation of OAB or BOO in both men and women, and in the elderly and children. Using a LUTS symptom score such as the IPSS or AUA-SI as a diagnostic tool for BOO or BPH could be inappropriate and lead to an incorrect therapeutic strategy. [12]

A high rate of intravesical prostatic protrusion (IPP) has been associated with a higher risk of treatment resistance, acute urinary retention, and the need for prostatic surgery in patients receiving dutasteride treatment for symptomatic BPH. Dutasteride might not be effective for IPP reduction. Recently, a greater prostatic urethral angulation was found to associate with a lower Qmax. Similarly, patients with a higher bladder neck elevation angle ($\geq 35^{\circ}$) had a higher BOO index and more obstructed voiding patterns than those with a lower bladder neck elevation angle. Urethral closure pressure had a significant positive linear correlation with the Abrams–Griffiths number and had a strong association with BOO. Micturition urethral pressure profilometry was able to localize the site of obstruction in patients with BOO. Therefore, urethrocystoscopy and urodynamic study can be considered in cases of invasive treatment, recurrent incontinence and specific situations. These clinical investigations can help in the diagnosis of male LUTS/BPH.[12]

MATERIALS AND METHODS

Study design: Prospective Observational longitudinal study
Study duration: 18 months (December 2016 to June 2018)
Sampling technique: Universal sampling
Sample size: All the cases of LUTS due to BPH attending department of general surgery in a tertiary healthcare centre during the study period and fulfilling inclusion criteria were included in the study. At the end of the data collection phase, data of total 84 eligible patients was recorded. Case definition: Male patients, more than 50 years of age with LUTS and prostatomegaly on digital rectal examination and USG.

Inclusion criteria

All the male patients, more than 50 years of age with LUTS and prostatomegaly on digital rectal examination and USG, with:

1. IPSS score 8 & above
2. Normal serum PSA level
3. Recurrent urinary tract infections
4. Recurrent retention of urine
5. Hematuria

Exclusion criteria

1. Carcinoma of prostate
2. Bladder calculus
3. Neurological disorders
4. Medications interfering with bladder functions i.e. antipsychotic drugs, antispasmodics
5. Renal insuffucuency
6. LUTS due to stricture or any other causes
7. H/O previous TURP

Methods

Patients diagnosed to have LUTS due to BPH were assessed according to IPSS questionary. Patients having LUTS due to BPH were evaluated for prostatic volume by ultra-sonography. Patients having LUTS were clinically examined per rectal for digital rectal examination.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

In the present study, we assessed the study cases according to their age distribution. We observed that majority of the cases belonged to age group of 61-70 years (42.85%), followed by 51-60 years (27.38%) and 71-80 years (16.66%), more than 80 years in 13.09% of the cases. The total age wise distribution is mentioned in the table 1 given below.

Table 1: Distribution of study population according to their age

Age wise distribution	No. of cases	Percentage
51-60	23	27.38%
61-70	36	42.85%
71-80	14	16.66%
>80	11	13.09%
Total	84	100%

LITERACY STATUS

In the present study, we assessed the literacy status of the study subjects. We observed that the majority of the cases studied upto High School (35.71%), followed by (29.76%) higher secondary school. A significant proportion of cases were illiterate (27.38%) in table 2.

Table 2: Distribution of study population according to their literacy status

Literacy Status	Number of cases	Percentage
Illiterate	23	27.38%
High School	30	35.71%
Higher secondary school	25	29.76%
Graduate	6	7.14%
Total	84	100%

CLINICAL PRESENTATION

In the present study, we assessed the clinical presentation of the study subjects. We observed that majority of the study subjects presented with Nocturia (77.38%), followed by Frequency (69.04%), straining (67.85%), urinary urgency (66.66%), sense of incomplete bladder emptying (46.42%) and Decrease force of Stream (46.42%) in table 3.

Table 3: Distribution of study population according to their clinical presentation

Clinical presentation	No. of cases	Percentage
Nocturia	65	77.38%
Frequency	58	69.04%
Straining	57	67.85%
Urgency	56	66.66%
Sense of incomplete bladder emptying	39	46.42%
Decrease force of Stream	39	46.42%

IPSS Score

In the present study, we assessed the LUTS of study subjects according to their IPSS score. We observed that majority of the subjects i.e 51 have IPSS score in table 4 between 8-19 (moderate symptomatic), followed by 33 subjects having severe IPSS score (severe symptomatic).

Table 4: IPSS Score

IPSS Class	IPSS Score	Number of cases
Mild asymptomatic	1-7	0
Moderate symptomatic	8-19	51
Severe symptomatic	20-35	33

DISCUSSION

In the present study, we assessed 84 cases of benign prostatic hyperplasia, admitted under department of general surgery, KIMS, Karad. We recorded clinical history, examination findings, investigations related data with the help of standard case record proforma. The collected data was analyzed and presented in the form of tables and charts.

DEMOGRAPHIC CHARACTERISTICS

In the present study, we assessed the study cases according to their age distribution. We observed that majority of the cases belonged to age group of 61-70 years (42.85%), followed by 51-60 years (27.38%) and 71-80 years (16.66%), more than 80 years in (13.09)% of the cases. Oranusi CK ek al,[13] in their study conducted, observed that the mean patient age was 67.35 ± 8.97 (46-87).

LITERACY STATUS

In the present study, we assessed the literacy status of the study subjects. We observed that the majority of the cases studied upto High school (35.71%), followed by (29.76%) higher secondary school. A significant proportion of cases were illiterate (27.38%).

CLINICAL PRESENTATION

In the present study, we assessed the clinical presentation of the study subjects. We observed that majority of the study subjects presented with difficulty in micturition (77.38%), followed by urinary urgency (69.04%), Frequency in 57 cases, Sense of incomplete bladder emptying among 56 cases, Decrease force of Stream in 39 cases and Nocturia among 15 cases.

IPSS Score

In the present study, we assessed the LUTS of study subjects according to their IPSS score. We observed that majority of the subjects has IPSS score between 8-19 (moderate symptomatic), followed by 33 subjects having severe IPSS score (severe symptomatic).

CONCLUSION

Form the present study, it can concluded that

The IPSS is a worldwide scoring instrument used for the assessment of the severity of symptoms in men with LUTS. The complexity of the IPSS questionnaire causes problems with patients with a low educational level. IPS Score can be used among cases of BPH, with LUTS. There is no direct one to one correlation between prostatic volume and severity of LUTS.

CONFLICT OF INTEREST

None

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