Research Article

Evaluation of benign prostatic hyperplasia: A cystometric and clinicopathological study

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ABSTRACT

Background: Benign prostatic hyperplasia (BPH) is characterized by the nonmalignant overgrowth of prostatic tissue surrounding the urethra, ultimately constricting the urethral opening, and giving rise to associated lower urinary tract symptoms. **Objectives:** Diagnosis of BPH is made based on histologic examination of prostatic tissue. This study aimed to evaluate the clinicopathological and cystometric changes in BPH patients. **Materials and Methods:** In this study, 61 elderly males who were suffering from clinical BPH were included. Patients of different age groups ranging from 50 to 80 years and more were considered. All patients were undergone clinical, urine examination, and ultrasound scan was performed to confirm the hypothesis. The patients were divided into three subgroups according to the International Prostate Symptom Score as mild, moderate, and severe. **Results:** In mild group of patients, the mean compliance was 44.11; in moderate, it was 21.90; and in severe group, it was 17.54. **Conclusion:** This study concluded that as severity of bladder outlet obstruction increases, the compliance of bladder decreases. Cystometric evaluation of bladder compliance should be an essential part in pre-operative evaluation of symptomatic BPH patients.

KEY WORDS: Benign Prostatic Hyperplasia; Prostate; Cystometry

INTRODUCTION

Benign prostatic hyperplasia (BPH), the most common benign tumor in 78% of elderly men older than 50 years of age, is responsible for urinary symptoms.[1] BPH has been known for centuries to be a cause of urinary dysfunction. It was mentioned in the Egyptian papyri as early as 1500 BC and was discussed by Hippocrates 1000 years later. From the time of birth until puberty, there is little change in the size of prostate. At puberty, a rapid increase in size occurs that continues up to the third decade. Prostatic growth, at this time, increases at the rate of 1.6 g/year. Thereafter, its growth markedly decreases to 0.4 g/year in men of age 31-90 years.[2] At age 55, approximately 25% of men note a decrease in the force of their urinary stream; at age 75, this increase linearly to 50%.[3]

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Etiology of BPH is unclear. Several hypotheses have been put forth based on histologic, hormonal, and age-related changes. Two factors, necessary for BPH to occur, are the presence of dihydrotestosterone (DHT) and aging. The importance of DHT in prostatic growth is dramatically manifested in patients with congenital deficiency of 5-alpha reductase, the enzyme responsible for conversion of testosterone to DHT.[4]

The relative roles of androgens and estrogens in inducing BPH, however, are complex and not understand completely. It is known that castration before puberty prevents BPH, and castration in the patients with established BPH, however, does not uniformly result in prostatic atrophy. A probable explanation may be that androgens are required for initiation of BPH but not for its maintenance.[5,6]

Cystometry is the recording of the pressure-volume relationship of the bladder. The method yields important

information concerning accommodation of the bladder to increased filling volumes and sensory perceptions. The term cystometry usually indicates measurement of the detrusor pressure during controlled bladder filling and subsequent voiding with measurement of synchronous flow rates. This study was conducted to evaluate the clinicopathological and cystometric changes in BPH patients.

MATERIALS AND METHODS

This study was conducted in patients suffering from prostate enlargement who were admitted in the Department of General Surgery, MNR Medical College and Hospital, Sangareddy, from 2013 to 2015. Patients of different age groups ranging from 50 to 80 years and more were considered. Symptoms found in elderly male patients were attributed to prostatism such as difficulty in micturition, increased frequency of micturition, dribbling of retention overflow, retention of urine, urgency in micturition, and other associated symptoms (such as fever, burning micturition, evidence of uremia as loss of appetite, headache, nausea, and vomiting) were also carefully noted.

The history of all patients was taken, and clinical examination was performed. Patients with symptoms of prostatism were subjected to digital rectal examination (DRE) of prostate gland, and nature of enlargement was noted by consistency, presence of nodularity, state of median groove, mobility of the gland, and presence of post prostate pouch of the bladder.

Following blood investigations (hemoglobin%, total leukocyte count, differential leukocyte count, blood sugar, blood urea, serum creatinine), routine and microscopic urine examination, ultrasound scan, and residual urine whenever possible were carried out in all the cases.

RESULTS

In this study, 61 elderly males who were suffering from clinical BPH were included. They were admitted to surgical wards of MNR Medical College and Hospital, Sangareddy (Table 1).

The patients were diagnosed as BPH on the basis of DRE and symptoms of prostatism. Three patients included in this study were divided into three groups as mild, moderate, and severe on the basis of the International Prostate Symptom Score (IPSS) (Tables 2-5).

DISCUSSION

The improvised cystometry as already discussed in material and methods was carried out in 61 patients diagnosed as BPH, who were admitted to MNR Medical College, Hospital, Sangareddy, between 2013 and 2015 and the patients were divided into three subgroups according to IPSS as mild, moderate, and severe. The compliance was calculated. In mild group of patients, the mean compliance was 44.11; in moderate, it was 21.90; and in severe group, it was 17.54. Hence, it can be concluded from this study that as severity of bladder outlet obstruction (BPH) increase, the compliance of bladder decreases.

Table 1: Age distribution of BPH patients

Age (years)	Number of patients
45-50	04
51-55	06
56-60	10
61-65	11
66-70	12
71-75	09
76-80	07
>80	02
Total	61

BPH: Benign prostatic hyperplasia

Table 2: Distribution of patients according to IPSS

IPSS	Grade	Number of cases
0-7	Mild	5
8-19	Moderate	25
20-35	Severe	31
Total		61

IPSS: International Prostate Symptom Score

Table 3: Intravesical volume (ml) (cystometric recordings)

Clinical interpretation	Normal	Mild	Moderate	Severe
First sensation	50-150	90-110	110-180	100-180
True sensation	150-250	160-220	130-280	110-280
Bladder capacity	350-450	340-410	210-350	230-300

Table 4: Intravesical pressure (cm of saline)

Clinical interpretation	Normal	Mild	Moderate	Severe
First sensation	2-3	3-5	3-8	5-11
True sensation	4-5	4-7	5-10	6-13
Bladder capacity	8-9	6-11	9-20	8-28

Table 5: Bladder compliance (ml/cm of saline)

Compliance	Volume
Normal	47.05
Mild	44.11
Moderate	21.09
Severe	17.54

A common finding in BPH patients and especially in those who primarily have irritative symptoms is the presence of impaired bladder contractility and detrusor instability.[7] The bladder responds to obstruction with an increased incidence of uninhibited detrusor contractions and with a loss of contractile ability.[8] Some of the symptoms associated with BPH however might, in fact, be symptoms of an aging bladder rather than secondary symptoms to subvesical obstruction. The simplest urodynamic method to determine whether obstructive uropathy (BPH) is serious enough to demand treatment is the measurement of bladder compliance. The incidence of altered bladder compliance in a population with BPH diagnosed by symptoms and flow rates is unknown but it must be low. The compliance data in this study were gathered from patients who presented with azotemia and large residual urine.[9]

In a study, a significant correlation was found in between maximum isometric contraction pressure and severity of obstruction in 168 patients. The proportion of poor compliance (<30 ml/cm of water) was lowest in the normal group. A consistent decrease in compliance does not appear to be a consistent finding in the patients with outlet obstruction. However, the proportion of patients with poor compliance is higher in the group with obstruction than in those with normal urodynamic findings.[10] Among the cystometric parameters investigated, low compliance was most relevant to clinical features of BPH and had some predictive value for the outcome after prostatectomy.[11-13]

When significant residual urine is present, it represents degree of bladder decompensation and failure which indicates that an appropriate urodynamic appraisal is overdue. The whole contraption is simple, economic, and easy to work out, which yields reasonably reliable results. Cystometric evaluation of bladder compliance should be an essential part in pre-operative evaluation of symptomatic BPH patients. There lies an inverse relationship between severity of BPH and bladder compliance, i.e. as severity of obstructive uropathy increases, compliance decreases. Therefore, on the basis of above facts, it can safely be concluded that this study nearly corresponds to previous studies conducted by various others using either standard cystometry or any other modified cystometric technique.

CONCLUSION

This study concluded that as severity of BPH increases, the compliance of bladder decreases. Cystometric evaluation of bladder compliance should be an essential part in pre-operative evaluation of symptomatic BPH patients.

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