



## CORRELATION BETWEEN BENIGN PROSTATIC HYPERPLASIA AND DYSLIPIDEMIA

### General Surgery

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### ABSTRACT

Benign prostate hyperplasia (BPH) is the most common benign disease in elderly men caused by non-malignant, unregulated growth of the prostate gland. It was observed clinically, that the diabetics and obese men had larger prostate gland comparative to the other men. The purpose of the present study was to perform a BPH risk factor analysis in men, relating the prostate gland volume to Dyslipidemia and to identify clues to the aetiology of BPH. This Observational, Cross-sectional study was done in Rajendra Institute of Medical Sciences, Ranchi with 120 patients attending Outpatient and Inpatient Surgery Department, complaining of lower urinary tract symptoms. The age of the patients included in this study was 50-65 years. Mean prostate volume of patients aging between 50-55 years was 34.80 ml which increased to 37.27 ml among patients aging 56-60 years and increased further to 43.80 ml among patients aging 61-65 years. The result of our study suggested that central obesity in men may increase the frequency and severity of urinary obstructive symptoms (p value: 0.013) but no positive correlation was found between lower urinary tract symptom severity and prostate volume (p value: 0.977). Benign prostatic hyperplasia is a disease of aging population but it is not uncommon in middle aged population also. The incidence of dyslipidemia is increasing in aging Indian men and the risk for benign prostatic hyperplasia is high among this population. Dyslipidemia may be considered as one of the modifiable risk factors for benign prostatic hyperplasia.

### KEYWORDS

BPH, Dyslipidemia, LUTS, Obesity, Metabolic Syndrome.

### INTRODUCTION

Benign prostate hyperplasia (BPH) is the most common benign disease in elderly men caused by non-malignant, unregulated growth of the prostate gland. It induces to troublesome lower urinary tract symptoms (LUTS) and is associated with complications such as haematuria, acute urinary retention, calculi, urinary tract infections, and need for surgical interventions.[1]

Autopsy studies and physical examination have revealed evidence of BPH in 25% of men aged 40-49 years, rising to 80 % among men 70-79 years old.[2] Conditions, such as metabolic syndrome (MetS), lower urinary tract symptoms (LUTS) associated with BPH, which occur with relatively high frequency in aging men[3,4]. These are common disorders, where the prevalence increases with advancing age, are frequently co-associated in the same aging male group. For a surgeon to take care of our BPH patients, understanding the relationship and possibly impact of Dyslipidaemia on the disease is important.

The aetiology of benign prostatic hyperplasia (BPH) is unknown[5,6]. Several etiologic factors for BPH have been proposed. A clinical observation showed that diabetic and obese men had larger prostate glands than men without these conditions.

Daniell [7] found increased specimen weights with increasing obesity in men subjected to transurethral resection of the prostate. However, Sidney et al [8] reported that surgery for BPH was performed less frequently among overweight men and Glynn et al [9] reported that obese men were less likely than lean men to have a clinical diagnosis of BPH based on symptoms and digital rectal examination.

In a recent report by the Third National Health and Nutrition Examination Survey (NHANES III) [10], positive correlation were demonstrated between markers of metabolic syndrome and LUTS/BPH in 2372 men older than 60 years.

The purpose of the present study was to perform a BPH risk factor analysis in men, relating the prostate gland volume to one of the components of the metabolic syndrome, i.e., Dyslipidaemia and to identify clues to the aetiology of BPH.

### MATERIALS AND METHOD

This Observational, cross sectional study was done in Rajendra Institute of Medical Sciences, Ranchi (RIMS) from April 2018 to

September 2019. 120 patients attending the Outpatient and Inpatient Department of Surgery of Rajendra Institute of Medical Sciences, Ranchi with lower urinary tract symptoms were included in the study. But sixteen patients were excluded during the study. All patients, who will present with lower urinary tract symptom, with or without manifestations of dyslipidaemia were included. Exclusion of the patients was done in case of malignancy, under treatment of BPH prior to study, history of urinary or bladder surgery or presence of any endocrinological disorder other than NIDDM.

Informed consent was obtained from all participants. Majority of these men were investigated merely because of lower urinary tract symptoms and needed no treatment. A few of these men were later on subjected to medical or surgical treatment because of BPH. The diagnosis of treated hypertension and diabetes mellitus was provided by the patient's medical history.

In addition, the following anthropometric and urological evaluations were performed: data on blood pressure, waist and hip measure, body height and body weight were collected and body mass index (BMI, kg per m<sup>2</sup>) and waist/hip ratio (WHR) were calculated.

Fresh serum was analysed for total cholesterol, HDL-cholesterol, triglycerides.

### RESULT

A statistical analysis was done on 104 cases and various factors were compared studied.

The age of the patients included in this study was between 50 to 65 years. They were stratified into three age groups. Majority of patients (39.43%) had age between 61-65 years.

#### Mean Prostate Volume In Different Age Groups:

There was positive correlation between increasing age and prostate volume (p value: 0.037). With increasing age the mean prostate volume has increased significantly (mean prostate volume in age group 50-55 years and 61-65 years are 34.80 ml and 43.80 ml respectively).

#### Distribution Of Cases With Respect To Ips Score:

Of the 104 patients presented with Lower Urinary Tract symptoms, 36 patients had moderate (IPS score: 8-19) symptoms and 68 patients had severe (IPS score: 20-35) symptoms. No one had IPS score <7.

Out of 68 patients who had presented with severe LUTS, 59 patients had central obesity and the result was statistically significant (p value: 0.013) which suggested that central obesity in men may increase the frequency and severity of urinary symptoms. No positive relationship was found with LUTS and other components of metabolic syndrome (hypertension, serum blood glucose, HDL cholesterol, serum triglycerides).

#### MEAN PROSTATE GLAND VOLUME IN MEN WITH LOW SERUM TRIGLYCERIDE (<150 MG/DL) OR HIGH SERUM TRIGLYCERIDE (≥150 MG/DL):

In our study 30 patients (28.85%) were found to have serum triglyceride ≥150 mg/dl. Mean prostate volume in patients having raised serum triglyceride was 49.13 ml, which was higher than their counterparts having normal serum triglycerides (mean prostate volume 35.21 ml). The result was statistically significant (p value: 0.0001) i.e. there is positive correlation between serum triglyceride and BPH.

#### MEAN PROSTATE GLAND VOLUME IN MEN WITH LOW HDL-CHOLESTEROL (<40 mg/dl) OR HIGH HDL-CHOLESTEROL (≥ 40 mg/dl):

Serum HDL cholesterol <40 mg/dl, which is another component of metabolic syndrome was found in 59.6% of cases in this study with p-value 0.042. And in this case also mean prostate volume was found to be higher among patients with low serum HDL than normal serum HDL level.

**Table 1 : Mean Prostate Gland Volume In Men With Low Hdl-cholesterol (<40 Mg/dl) Or High Hdl-cholesterol (≥ 40 Mg/dl)**

|                 | HDLCHOLESTEROL      |                     | Pvalue | Significance |
|-----------------|---------------------|---------------------|--------|--------------|
|                 | <40mg/dl            | ≥40mg/dl            |        |              |
|                 | Mean±Std. Deviation | Mean±Std. Deviation |        |              |
| Prostate Volume | 35.52±17.29         | 41.47±16.97         | 0.042  | Significant  |

**Table 2: Mean Prostate Gland Volume In Men With Low Serum Triglyceride (<150 Mg/dl) Or High Serum Triglyceride (> 150 Mg/dl)**

|                 | SerumTriglyceride   |                     | Pvalue | Significance |
|-----------------|---------------------|---------------------|--------|--------------|
|                 | <150mg/dl           | ≥150mg/dl           |        |              |
|                 | Mean±Std. Deviation | Mean±Std. Deviation |        |              |
| Prostate Volume | 35.21±13.37         | 49.13±21.26         | 0.0001 | Significant  |

#### DISCUSSION

The present study has been conducted in the Department of Surgery, Rajendra Institute of Medical Sciences, Ranchi with an objective to evaluate correlation between dyslipidaemia and benign prostatic hyperplasia.

Mean prostate volume of patients aging between 50-55 years was 34.80 ml which increased to 37.27 ml among patients aging 56-60 years and increased further to 43.80 ml among patients aging 61-65 years. The result of our study suggested that central obesity in men may increase the frequency and severity of urinary obstructive symptoms (p value: 0.013) but no positive correlation was found between lower urinary tract symptom severity and prostate volume (p value: 0.977).

The relationship between BPH and dyslipidemia has been documented in several studies. Hammarsten et al [11] examined the data of 158 men and reported that individuals with a low level of HDL cholesterol (<1.18 mmol/l) had a larger prostate volume (mean: 49.0 vs. 39.0 ml; p=0.002) and a higher annual BPH growth rate (mean: 1.02 vs. 0.78 ml/y; p=0.006) than did individuals with a high level of HDL cholesterol (≥1.18 mmol/l). In a subsequent report, Hammarsten and Högstäd corroborated these findings in a larger sample (n=307) [4]. Nandeesh et al observed that men with BPH had a significantly higher total cholesterol (mean: 4.5 vs. 4.2 mmol/l; p<0.05) and low-density lipoprotein (LDL) cholesterol levels (mean: 2.8 vs. 2.2 mmol/l; p<0.001) than did men without BPH [12]. The same authors observed that the level of HDL cholesterol was significantly lower in men with BPH than in those without BPH (mean: 0.9 vs. 1.2 mmol/l; p<0.001).

Sung JinYim et al in their study did not find any relationship between prostate volume and HDL-C or Triglyceride. In the study conducted by Rohrmann et al [13] using data from NHANES III, they also did not find any relationship between LUTS and HDL-C, low density lipoprotein, TG, or total cholesterol.

A positive correlation between BPH and raised serum triglyceride was found in our study (mean prostate volume: 49.13 vs. 35.21 ml; p value: 0.001) but we could not find any correlation between BPH and serum HDL cholesterol (mean prostate volume: 41.47 vs. 35.52 ml; p value: 0.042).

#### CONCLUSION

Benign prostatic hyperplasia is a disease of aging population but it is not uncommon in middle aged population also. These patients present with various degrees of lower urinary tract symptoms and the symptom severity does not correlate with prostate volume. Central obesity increases the frequency and severity of urinary obstructive symptoms. Metabolic syndrome, which is a constellation of different components, has positive correlation with prostate volume. Raised fasting blood glucose, hypertension, serum triglyceride, HDL cholesterol have positive correlation with prostate volume. The incidence of dyslipidaemia is increasing in aging Indian men and the risk for benign prostatic hyperplasia is high among this population. Dyslipidaemia may be considered as one of the modifiable risk factors for benign prostatic hyperplasia.

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