

Study of Dyslipidemia in Elderly Male Population with Benign Prostatic Hyperplasia

Dr Manisha Gurjar¹, Dr Ranjana Mathur², Dr Anoop Singh Gurjar³, Dr Poonam Parakh⁴

¹Assistant Professor, Department of Biochemistry, Dr S. N. Medical College, Jodhpur Rajasthan India

²Senior Professor and Head, Department of Biochemistry, Dr S. N. Medical College, Jodhpur, Rajasthan India

³Assistant Professor, Department of Anatomy, Dr S. N. Medical College, Jodhpur, Rajasthan India

⁴Assistant Professor, Department of Obstetrics and Gynecology, Dr S. N. Medical College, Jodhpur, Rajasthan India

***Corresponding author**

Dr Anoop Singh Gurjar

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Abstract: The aim is to investigate the relationship between serum lipids, serum PSA and Benign Prostatic Hyperplasia (BPH) in elderly male population of Western Rajasthan. The present study was conducted on six hundred and one male subjects, 50 years or above of the age including 300 age matched controls and 301 subjects with histopathologically confirmed BPH. Patients were worked up with detailed history and clinical examination to rule out other causes of lower urinary tract symptoms (LUTS) and complications of BPH. Serum PSA and serum lipid profile was done in all patients before biopsy, digital rectal examination (DRE) or ultrasound (Abdominal/TRUS). Mean serum PSA was significantly higher in BPH subjects as compared to healthy controls. A significant correlation of serum PSA was observed with age of BPH subjects but a non-significant correlation was observed between Serum PSA and parameters of lipid profile. Mean serum total cholesterol and LDL cholesterol were significantly higher in BPH subjects as compared to healthy subjects, but a non-significant difference in serum Triglyceride, HDL and VLDL cholesterol was observed. In any elderly patient presenting with BPH, the possible presence of dyslipidemia, and other components of metabolic syndrome should be considered. Conversely in patients suffering from these conditions, the possibility of a clinically important BPH should be kept in mind.

Keywords: Benign Prostatic Hyperplasia, lower urinary tract symptoms, dyslipidemia, metabolic syndrome, lipid profile.

INTRODUCTION

No man can escape the changes which begin to occur in his prostate with the growing age. After forty years of age the microscope will show tiny foci of Benign Nodular Hyperplasia throughout the substance of tissue of prostate gland. The prevalence of BPH is very high and increases with age. More than 40% of men in their fifties and almost 90% of men in their eighties develop BPH [1]. The absolute number of patients affected with BPH is rising worldwide as a result of aging population.

Although not a life threatening condition, BPH poses a significant public health problem. Overgrowth of prostatic tissue surrounding the urethra, ultimately constrict the urethral opening giving rise to associated lower urinary tract symptoms (LUTS) such as urgency, frequency, nocturia, incomplete bladder emptying and weak stream [2]. Thus BPH can significantly affect

quality of life and is associated with significant morbidity among elderly men [3].

Although aging and androgens are established risk factors, but still the cause of BPH remains uncertain. Several different mechanisms were hypothesized to be involved in the progression of BPH including hormonal or vascular alterations, inflammation, epithelial/stromal interactions, and luminal/epithelial cell interactions [4].

Metabolic factors promote pathogenesis of prostate hyperplasia and benign prostatic hyperplasia. Obesity, dyslipidemia and elevated fasting glucose are components of the metabolic syndrome and are associated with systemic inflammation and oxidative stress. Inflammation had been implicated as a primary stimulus for prostate carcinogenesis and possibly BPH represents an alternate, nonmalignant pathway of unregulated prostate growth promoted by oxidative

stress, inflammatory mediators and Fibroblast Growth Factors [5].

MATERIAL AND METHODS

The present study was conducted on 601 subjects admitted in Surgery and Urology Wards of Hospitals attached to Dr. S. N. Medical College, Jodhpur, Rajasthan.

The subjects selected for the study were grouped as follows:-

Healthy control subjects:

Three hundred (300) male controls 50 years or above of age were selected from the patients admitted in Surgical ward of M.G. Hospital attached to Dr. S. N. Medical College, Jodhpur. Subjects with high blood sugar, dyslipidemia, abnormal renal functions and high serum PSA were not included. It was also ensured that all the controls were having normal prostate confirmed by digital rectal examination and transabdominal ultrasonography and were presenting no clinical symptoms of bladder outflow obstruction.

BPH Subjects

Three hundred and one (301) subjects presenting clinical symptoms of LUTS undergoing transurethral resection of prostate (TURP) / prostatectomy after through clinical evaluation and histopathological confirmation were included in this group. Men with LUTS caused by any urological malignancy, those who had previous prostatic surgery or pelvic radiotherapy or complications of urinary obstruction (due to urethral stricture, bladder neck contracture, bladder stone, carcinoma bladder, neurogenic bladder, renal failure, recurrent urinary tract infection or residual urinary volumes >200 ml) prostatitis, prostatic abscess and diabetics were excluded from the study.

Reports of serum PSA levels, serum Lipid Profile and findings of systematic DRE performed by the attending urologist were noted. As a routine practice

DRE examination was scheduled after collection of blood sample to avoid an increase in serum PSA that may follow digital manipulation of the gland. Other routine investigations like complete blood count, erythrocyte sedimentation rate, blood Sugar, renal profile and urine complete were also performed.

The data assembled from different clinical and biochemical parameters were subjected to suitable statistical analysis to establish the significance of these parameters and their inter parameter correlation. Pearson's test for correlation was used to analyze the linear correlation between PSA and parameters of lipid profile

RESULTS

A total of 601 subjects were included in the study. Effect of age on BPH and serum PSA values was studied (Table No.: 1). Percentage of BPH subjects in each age group increases as we move from age group of 50-59 years to age group of ≥70 years. Maximum number of BPH subjects (60.8%) belonged to age group ≥70 years. In the age group of 50-59 years all the subjects had serum PSA in range of 0.1-4.0 ng/ml. All the subjects with serum PSA >10.0 ng/ml were above 70 years of age. Further serum PSA of BPH correlated significantly with age of BPH subjects (r-value: 0.557, p-value: <0.0001). A similar correlation is reported in an Indonesian study [6]. Thus BPH is a disease of old age and its prevalence increases with age. Mean serum PSA was significantly higher in BPH subjects (3.71 ± 2.2 ng/ml) as compared to healthy controls (2.32 ± 1.11 ng/ml).

On comparing parameters of lipid profile of BPH subjects with healthy controls it was observed that Serum Total Cholesterol and LDL Cholesterol were significantly higher in BPH subjects as compared to healthy subjects (Table No.: 2). However a non-significant association was observed when serum PSA of BPH subjects was correlated with serum total cholesterol, triglycerides, HDL, LDL and VLDL cholesterol of BPH subjects (Table No. 3).

Table-1: Distribution of BPH Subjects in various Age Groups and Serum PSA Range.

S.No.	Age (Years)	No. of BPH subjects (301)	S.PSA (ng/ml)		
			0.1-4.0 %	4.1-10.0 %	>10.0 %
1.	50-59	36 (12.0%)	100.0	0.0	0.0
2.	60-69	82 (27.2%)	86.58	13.42	0.0
3.	≥ 70	183 (60.8%)	70.49	25.68	3.83

Table-2: Comparison of Lipid profile of Controls and BPH Subjects

S. No.	Parameter	Mean ± S.D.(mg/dl)		Statistical Significance
		Controls	BPH Subjects	
1.	Serum Total Cholesterol	175.03 ± 17.73	180.25 ± 17.28	Significant
2.	Serum Triglycerides	131.37 ± 24.58	134.21 ± 26.87	Non Significant
3.	Serum HDL	41.35 ± 5.28	41.68 ± 5.45	Non Significant
4.	Serum LDL	106.99 ± 15.26	112.64 ± 16.65	Significant
5.	Serum VLDL	26.22 ± 4.87	26.90 ± 5.26	Non Significant

Table-3: Correlation of Serum PSA with Serum Total Cholesterol, Serum Triglycerides, Serum HDL, Serum LDL and Serum VLDL of BPH Subjects.

S. No.	Parameters	r-value	p-value	Statistical Significance
1.	Serum Total Cholesterol	0.013	0.8220	Non Significant
2.	Serum Triglycerides	0.002	0.9984	Non Significant
3.	Serum HDL	0.050	0.9602	Non Significant
4.	Serum LDL	0.0007	0.9903	Non Significant
5.	Serum VLDL	0.005	0.9310	Non Significant

DISCUSSION

Several studies have demonstrated that abnormal lipid profile can lead to BPH and hypothesized that dyslipidemia is a risk factor in the development of BPH. Abnormal concentrations of lipids and lipoproteins are well described risk factors for cardiovascular disease. Accumulating evidence indicates that modifiable risk factors of cardiovascular disease may also increase the risk of BPH and potentially contribute to development of BPH. Obesity, elevated fasting glucose, diabetes and metabolic syndrome have been associated with an increased risk for BPH [7]. But the results from the studies about the relationship between dyslipidaemia and BPH are conflicting.

To determine possible relationship of serum lipid concentrations and BPH a prospective study was conducted. Gocke *et al.* compared the serum lipid levels, PSA and prostate size between the patients with BPH and the age matched controls. Mean total cholesterol, triglyceride, HDL cholesterol, and LDL cholesterol of controls was 189.2 ± 35.3 mg/dl, 125 ± 57.7 mg/dl, 38.4 ± 7.6 mg/dl and 125.7 ± 31.7 mg/dl respectively. The mean total cholesterol concentration of BPH subjects (205.7 ± 31.9 mg/dl) was significantly higher (p-value: 0.03) from controls. However mean triglyceride (125 ± 57.7 mg/dl) mean HDL cholesterol (38.4 ± 7.6 mg/dl) and mean LDL cholesterol (125.7 ± 31.7 mg/dl) were not significantly different from controls [8].

In an Indian Study it was found that total cholesterol and LDL cholesterol were significantly higher and HDL cholesterol was significantly lower in BPH cases compared to controls. Serum total cholesterol and LDL cholesterol was significantly higher from controls in present study also. They reported that insulin had a significant regression with cholesterol, triglycerides, LDL cholesterol and VLDL

cholesterol. They suggested that dyslipidemia in BPH occurs due to insulin resistance and insulin plays role in promotion of prostate growth as it has been established as growth promoting hormone [9].

From the Third National Health and Nutrition Examination Survey (NHANES III) of US population, to determine whether medical or biochemical indicators of the metabolic syndrome were associated with LUTS a lower mean HDL cholesterol (1.1 mmol/L) concentration in men with LUTS was observed compared with men without LUTS (1.21 mmol/L, p-value: 0.05). However mean total cholesterol in men with LUTS (5.54 mmol/L) and in men without LUTS (5.49 mmol/L), mean LDL cholesterol in men with LUTS (3.58 mmol/L) and in men without LUTS (3.48 mmol/L) and mean triglyceride concentration in men with LUTS (1.86 mmol/L) and in men without LUTS (1.82 mmol/L) were not significantly different [10].

However in the Rancho Bernardo study, which was a prospective, community based cohort study it was observed that there was no significant difference in mean total cholesterol concentration between the healthy controls (195.1 mg/dl) and BPH group (196.1 mg/dl, p-value: 0.76), mean LDL cholesterol concentrations between healthy controls (121.0 mg/dl) and BPH group (124.1 mg/dl, p-value: 0.25), mean HDL cholesterol concentrations between healthy controls (49.0 mg/dl) and BPH group (49.11 mg/dl, p-value: 0.93) and mean triglyceride concentrations between healthy controls (103.6 mg/dl) and BPH group (98.0 mg/dl, p-value: 0.23). They found that among all participants combined, there were no significant associations of BPH with any lipid or lipoprotein [11]. A similar non association of hyperlipidemia with histological BPH was observed in a case control analysis of Italian men [12]. No association of serum lipids or lipoproteins was observed with IPSS score or

prostate volume (prostate enlargement) in cohort of Turkish men [13].

CONCLUSION

Relationship between dyslipidemia and BPH is diverse. Dyslipidemia, being common factor in both metabolic syndrome and BPH the extent of association will have to be further investigated and further research is required to clarify this relationship. In a clinical setting, in any patient presenting with BPH, the possible presence of Dyslipidemia, NIDDM, hypertension, high insulin should be considered. Conversely in patients suffering from these conditions, the possibility of a clinically important BPH should be kept in mind.

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