VOLUME - 11, ISSUE - 12, DECEMBER - 2022 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Physiology

ASSOCIATION BETWEEN BENIGN PROSTATIC HYPERPLASIA AND PRIMARY HYPERTENSION

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ABSTRACT

Introduction – Primary hypertension affects the occurrence and progression of benign prostatic hyperplasia(BPH). So, the aim of our study was to investigate the correlation of primary hypertension with the tissues of prostate. **Objective** – To find a correlation between primary hypertension and BPH. **Materials And Methods** – A cross sectional study was conducted on 94 patients coming to the Urology department OPD in Vivekanand Polyclinic and Institute of medical sciences, Lucknow. Their blood pressure was measured and the prostate gland was examined by digital rectal examination and volume was measured using ultrasound equipment. All the findings were tabulated in a master sheet and statistical analysis was done using statistical software SPSS version 20. An alpha level of 5% was taken, i.e. if any p value was less than 0.05 it was considered as significant. **Results** - High blood pressure or evidence of hypertension was found in 35 (37.23%, n=94) patients. Among these hypertensive patients, mean prostate volume was found to be higher than the patients having normal blood pressure (p value 0.000). **Conclusion**- Primary hypertension is positively correlated with BPH.

KEYWORDS : Hypertension, BPH.

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.

Severe BPH have a strong impact on the quality of life of afflicted patients, and its treatment will become a serious burden of economic expenditure.[1] Hypertension is a syndrome of metabolic, end-organ, and cardiovascular changes, including abnormalities in lipid, glucose, and insulin metabolism; decreased renal function; altered left ventricular structure; and altered compliance of proximal and distal arteries.

It is known that hypertension is an independent risk factor for CVD (D'Agostino et al., 2017), and hypertension and BPH are two common disorders in aged men. Besides, emerging evidence indicates that both BPH and hypertension are components of metabolic syndrome (MetS) (Corona et al., 2014). As the rapid aging of population progress, BPH, and hypertension have become a significant public health problem worldwide.

Since blood pressure elevation indicates sympathetic hyperactivity, this subject has become a focus of interest over recent years. The presence of hypertension as a component of metabolic syndrome has been recognized to play a role in the development of severe lower urinary tract symptoms. It has been shown that bladder dysfunction may occur in the presence of endothelial dysfunction in the pelvic vascular system. The mechanism is based on increased sympathetic activity, especially α1-adrenoreceptor activity[5]. This pathway is common for hypertension and severe lower urinary tract symptoms. Other studies have demonstrated that there is an association between benign prostate hyperplasia and hypertension via activation of insulin-like growth factor and increased sympathetic nervous system activity.

So, in our present study we tried to find an association between hypertension and benign prostatic hyperplasia.

MATERIAL AND METHODS

Study Design: Observational, cross sectional study

Setting: Tertiary care Urology Centre

Study area: Vivekanand Polyclinic and Institute of medical sciences, Lucknow

Time Horizon: Jan 2020 to July 2022

Selection Of Subjects:

Sample Size: 115 patients attending the Urology Centre of a tertiary care hospital of Lucknow with lower urinary tract symptoms were included in the study. But 21 patients were excluded during the study.

Inclusion Criteria: All patients who will present with lower urinary tract symptoms.

Exclusion Criteria:

- Men with known malignant disease including carcinoma prostate.
- Men on alpha blockers or 5-alpha reductase inhibitors prior to study.
- Previous history of surgery related to Urinary bladder/ prostate.
- Any other endcrinological disorders other than NIDDM.

The study was previously approved by the Institution's Research Ethics Committee. Informed consent was obtained from all participants. The diagnosis of treated hypertension was provided by the patient's medical history.

The primary outcome measure was total prostate volume. The prostate gland was examined by digital rectal examination and volume was measured using ultrasound equipment. Ellipsoid method was used for calculation of prostate volume. Then all the findings were tabulated in a master sheet and statistical analysis was done by statistician using statistical software SPSS version 20.

Mean Prostate Volume across age groups were compared using Kruskal- Wallis Test. Prostate Volume were expressed as Mean and Standard Deviation and compared across BP using Mann-Whitney U test. An alpha level of 5% was taken, i.e. if any p value was less than 0.05 it was considered as significant.

Distribution of cases with respect to Age:

The age of the patients included in this study were between 50 to 65 years.

They were stratified into three age groups. Majority of patients (39.36%) had age between 61-65 years.

Table 1: Distribution Of Cases With Respect To Age Group.

Age Group In Years	No Of Patients	Percentage (%)
50-55	23	24.47
56-60	34	36.17
61-65	37	39.36
Total	94	100

Table 2: Mean Prostate Volume In Different Age Groups. Prostate Volume

AGE(Yrs)	Mean	Std. Deviation
50-55	36.52 ml	16.73
56-60	37.56 ml	19.36
61-65	44.22 ml	15.87
P Value	0.029	
Significance	Significant	

From statistical analysis it was observed that there was positive correlation between increasing age and prostate volume (p value: 0.029).With increasing age the mean prostate volume has increased significantly (mean prostate volume in age group 50-55 years and 61-65 years are 36.52 ml and 44.22 ml respectively.

High blood pressure or evidence of hypertension was found in 35 (37.23%, n=94) patients. Among these hypertensive patients, mean prostate volume was found to be higher than the patients having normal blood pressure (p value 0.000).

Table 3: Mean Prostate Gland Volume In Men With Or Without Treated Hypertension SBP/DBP

	< 130/85 MM-HG	>= 130/85 MM-HG	p Value	Significance
	Mean ± Std. Deviation	Mean ± Std. Deviation		
PROSTATE VOLUME	33.39 ± 11.73	50.94 ± 20.29	0.000	Significant

DISCUSSION

With increasing age, mean prostate volumes among the study population were observed to increase. Mean prostate volume of patients aging between 50-55 years was 36.52 ml which increased to 37.56 ml among patients aging 56-60 years and increased further to 44.22 ml among patients aging 61-65 years. Torralba et al did their prospective study on 163 patients, all older than 50 years and found statistically significant association between hypertension and LUTS secondary to BPH. Contrary to our study, Michel et al did their study on 9857 patients and found that significant age independent association exists between BPH symptoms and hypertension. Guo LJ et al concluded that prostatic volume was positively correlated with the years of hypertension in group BPH with hypertension as compared to group with simple BPH. Hwang et al concluded that systolic blood pressure was related to prostate volume and IPSS score.

Like other observational studies we also found positive correlation between hypertension and larger prostate volume (mean: 50.94 vs. 33.39 ml; p value: 0.000). Hammarsten et al examined the data of 158 Swedish men referred to one centre [47]. They reported that individuals with treated hypertension had a larger prostate volume (mean: 51.0 vs. 44.0 ml; p=0.003) and higher annual BPH growth rate (mean: 1.06 vs. 0.90 ml/y; p=0.002) than did controls. Similarly, Joseph et al reported that men with a history of hypertension had a 1.5-fold (95% CI: 1.1-2.1) higher risk of moderate-to-severe LUTS (defined as an American Urological Association Symptom Index [AUASI] of =8) compared with their counterparts without a history of hypertension [20]. Rohrman et al examined the data from 2,372 participants in the Third National Health and Nutrition Examination Survey (NHANES III) [21]. They reported that men with a history of hypertension had significantly higher odds of LUTS than did their counterparts without such a history (OR: 1.8; 95% CI: 1.2-2.6). Thus it can be concluded that hypertension is positively correlated with prostate volume. The current study was a cross sectional study on a small sample of 94 patients. The findings need to be validated by conduct of similar multicentric studies on a larger sample size with serial follow ups over a longer period of time.

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