Prevalence of Benign Prostatic Hyperplasia and Prostate Cancer Among Adults in Pakistan

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ABSTRACT

Background: Benign Prostatic Hyperplasia (BPH) and prostate cancer are common prostate-related conditions affecting adult males, especially as they age. Both conditions are associated with various risk factors such as age, family history, smoking, and obesity. **Objective:** The aim of this study was to investigate the prevalence, risk factors, and diagnostic markers, specifically prostate-specific antigen (PSA) levels, among patients diagnosed with BPH and prostate cancer. **Methods:** This descriptive cross-sectional study was conducted at Institute of kidney diseases, Hayatabad, Peshawar during June 2022 to March 2023. A total of 125 patients were added in the study. Data for this study were collected through a combination of clinical evaluations, laboratory tests, imaging, and histopathological examinations. Demographic data were collected from each patient, including age, family history of prostate diseases, lifestyle habits, and dietary factors. **Results:** The prevalence of BPH was found to be significantly higher (64%) compared to prostate cancer (20%). The majority of patients with both conditions were aged 60 years and above. A family history of prostate disease was reported by 50% of prostate cancer patients, while 25% of BPH patients had a similar history. Elevated PSA levels were found in 70% of prostate cancer patients, with a mean PSA of 12.0 ng/mL, compared to 4.5 ng/mL in BPH patients. Smoking and obesity were identified as common lifestyle factors among both patient groups, with prostate cancer patients showing a higher incidence of these risk factors. **Conclusions:** It is concluded that Benign Prostatic Hyperplasia (BPH) and prostate cancer are prevalent conditions among adult males, with BPH being more common than prostate cancer in this study. Age, family history, smoking, and obesity were identified as significant risk factors for both conditions.

INTRODUCTION

Benign Prostatic Hyperplasia (BPH) and prostate cancer are two of the most prevalent and significant health concerns among adult men worldwide. The prostate gland situated underneath the bladder serves a vital function for male reproductive health because it produces seminal fluid that sustains sperm during transport [1]. Prostate gland transformation together with BPH and prostate cancer become more frequent during male aging periods and strongly impact their living quality. The prostate gland shows benign enlargement which mainly develops in older mankind. BPH demonstrates high prevalence rates since about 50% of male patients develop BPH symptoms that start by age 60 and both prevalence along with age-related deterioration [2]. An enlarged prostate gland applies pressure to the urethra which produces urinary symptoms that include frequent urination difficulties to start and stop stream of urine as well as weak streaming urination and nocturia (detailed as frequent night time urination). BPH is not fatal to human life but it produces serious negative quality-of-life effects which might need medical treatment for symptom management [3].

BPH pathogenesis remains unclear since changing hormone levels related to aging appear to play a role. The lowering hormonal levels of testosterone during male

aging coincide with an increased ratio of estrogen to testosterone that might stimulate prostate tissue expansion. Individuals with BPH are at greater risk because of additional elements like obesity with lack of exercise and prostate family medical history [4]. Prostate cancer ranks as the third most widespread cancer in males after skin cancer types. A prostate gland tumor develops malignantly within the gland leading to potential death when cancer spreads from the prostate toward other body sections. The progression of prostate cancer happens silently during initial stages because men frequently do not show signs until the cancer reaches advanced stages. Advancing age together with family history of prostate cancer and ethnicity and lifestyle factors define the risk factors for prostate cancer [5]. Caucasian men have a greater chance of getting prostate cancer than men from African descent but Asians have the lowest susceptibility to this condition. A man acquires higher probabilities to get prostate cancer if he has relatives with prostate cancer in his family tree [6]. The risk of acquiring prostate cancer seems to rise from eating an excessive amount of high-fat foods and leading a less active lifestyle as shown by current research. Research shows the increasing frequency of BPH along with prostate cancer worldwide because of population aging combined with better diagnostic methods including prostate-specific antigen testing (PSA) and digital rectal exams (DRE) [7]. The increased use of modern diagnostic skills resulted in detecting prostate cancer in early stages therefore driving up reported disease frequency. Medical professionals continue to disagree about the amount of prostate cancer cases that get misdiagnosed and receive unnecessary medical treatment especially regarding tumors that develop slowly and do not harm the patient [8].

The frequency of both BPH and prostate cancer exists at widely different rates among various identity groups throughout the world. Modem health systems in developed nations report elevated prostate cancer detection rates because they offer diagnostic tools throughout their national healthcare network while meantime seeing diminishing prostate cancer death rates because of better treatment methods [9]. The absence of routine screening programs in developing countries produces late-stage prostate cancer detection that leads to higher mortality numbers. BPH along with prostate cancer in Pakistan faces serious increases as a public health matter [10]. Pakistan has advanced its healthcare facilities substantially although diagnostic detection practices along with community education stand as active barriers in the nation. Literature shows that in Pakistan more than half of male patients suffer from BPH with age being a significant risk factor. Healthcare institutions are likely to experience rising demands from patients with symptoms linked to BPH as the population age demographic grows. The medical community in Pakistan identifies prostate cancer as an emerging threat even though researchers have paid less attention to it than other types of cancer historically [11]. Prostate cancer cases in Pakistan currently show lower numbers than Western counterparts yet the condition increases at a steady pace throughout Pakistani urban areas because people their lack physical movement combined with dietary choices. Many Pakistani men only learn about their prostate cancer during advanced stages of the disease because few people are aware of screening options and access to such programs is inadequate thus decreasing the possibility of successful treatments [12]. BPH affects European populations at the same frequency as other populations while prostate cancer stands as the fourth most common reason for male cancer fatalities in these regions. Early diagnosis through PSA screening has detected more prostate cancers but simultaneously created worry about detecting non-harmful tumors. These diseases inflict multiple severe consequences on male patients with prostate problems at both psychological and emotional levels and in their physical state. The urinary symptoms associated with BPH result in decreased life quality for male patients leading to social challenges and negative effects on both their job performance and whole health status [13]. The aim of this study was to investigate the prevalence, risk factors, and diagnostic markers, specifically prostate-specific antigen (PSA) levels, among patients diagnosed with BPH and prostate cancer.

METHODOLOGY

This descriptive cross-sectional study was conducted at Institute of kidney diseases, Hayatabad, Peshawar during June, 2022 to March, 2023. A total of 125 patients were added in the study.

Inclusion Criteria
- Males aged 40 years or older.
- Patients who presented with symptoms suggestive of BPH or prostate cancer, including urinary symptoms such as difficulty urinating, frequent urination, weak urine flow, or nocturia.
- Patients who had elevated PSA levels or abnormal findings during a digital rectal exam.
- Patients who provided informed consent to participate in the study.

Exclusion Criteria
- Patients with a previous diagnosis of prostate surgery or prostate cancer who were undergoing treatment or follow-up.
- Patients with other types of cancer or those with advanced systemic diseases that might interfere with the study results.
- Patients who refused to participate or did not provide informed consent.

Data Collection

Data for this study were collected through clinical evaluations, laboratory tests, imaging, and histopathological examinations. Demographic data were collected from each patient, including age, family history of prostate diseases, lifestyle habits, and dietary factors. Patients underwent a clinical examination by urologists or oncologists, who assessed their symptoms using a structured questionnaire. This questionnaire asked about the frequency of urination, nocturia, and the presence of any pain or discomfort. A digital rectal exam (DRE) was performed, and a blood test measuring prostate-specific antigen (PSA) levels was also conducted. Patients with abnormal PSA levels or abnormal DRE findings were referred for further diagnostic procedures, including ultrasound and prostate biopsy. The ultrasound imaging helped in assessing the size and structure of the prostate, while biopsy samples were taken from patients suspected of having prostate cancer for histopathological analysis.

Data Analysis

Data were analyzed using SPSS v21. Descriptive statistics were used to determine the overall prevalence of BPH and prostate cancer in the study population. The prevalence rates were calculated by dividing the number of diagnosed cases by the total number of patients, offering a percentage that represents the burden of these conditions in the study group.

RESULTS

A total of 125 patients were added in the study. The mean age of BPH patients was 55.2 ± 7.1 years, while prostate cancer patients were slightly older, with a mean age of 57.8 ± 6.4 years. In terms of age distribution, the majority of BPH patients (60%) were in the 60-64 years group, while prostate cancer patients (52%) were primarily aged 65 years or older. Smoking was more prevalent among prostate cancer patients (60%) compared to BPH patients (40%), and obesity (BMI > 30) was also higher in prostate cancer patients (50%). A family history of prostate disease was more common among prostate cancer patients (50%) than BPH patients (25%). The mean PSA level was significantly higher in prostate cancer patients (12.0 ± 4.5 ng/mL) compared to BPH patients (4.5 ± 1.3 ng/mL), reflecting the diagnostic value of PSA in identifying prostate cancer.

Table 1

Demographic and Baseline Values of Patients

Demographic/ Characteristic	BPH Patients (n = 80)	Prostate Cancer Patients (n = 25)	Total (n = 125)
Age (Mean ± SD)	55.2 ± 7.1	57.8 ± 6.4	66.0 ± 6.8
Age Group			
40-59 years	32 (40%)	7 (28%)	39 (31%)
60-64 years	48 (60%)	5 (20%)	53 (42%)
≥65 years	0 (0%)	13 (52%)	13 (10%)

Smoking Status			
Smokers	32 (40%)	15 (60%)	47 (38%)
Non-Smokers	48 (60%)	10 (40%)	78 (62%)
Obesity (BMI > 30)	28 (35%)	12 (50%)	40 (32%)
Family History of Prostate Disease	20 (25%)	12 (50%)	32 (26%)
PSA (Mean ± SD, ng/mL)	4.5 ± 1.3	12.0 ± 4.5	7.5 ± 5.3

Figure: 1
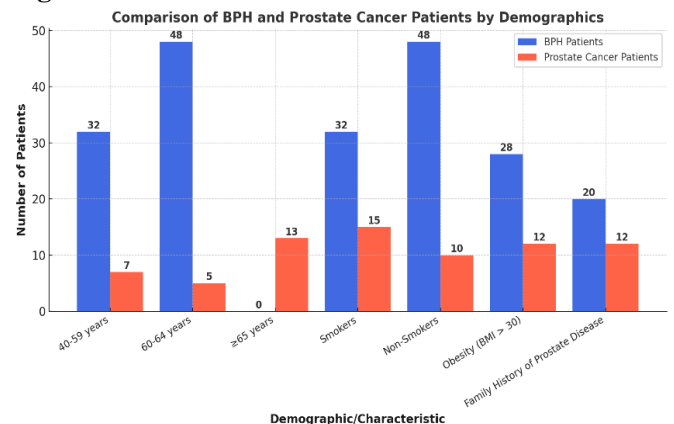
The distribution of prostate conditions among the 125 patients revealed that the majority were diagnosed with Benign Prostatic Hyperplasia (BPH), accounting for 64% of the patients (80 out of 125). Prostate cancer was less common, affecting 20% of the patients (25 out of 125). Other prostate-related issues, such as prostatitis and urinary tract infections, were present in 16% of the patients (20 out of 125).
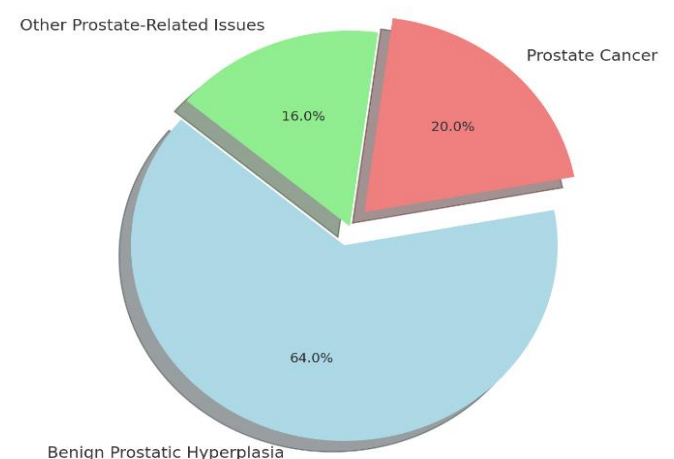
Table 2

Prevalence of Benign Prostatic Hyperplasia (BPH) and Prostate Cancer

Condition	Number of Patients	Percentage (%)
Benign Prostatic Hyperplasia	80	64%
Prostate Cancer	25	20%
Other Prostate-Related Issues	20	16%
Total	125	100%

Figure 2

Distribution of Prostate Conditions Among Patients

The average PSA level for BPH patients was 4.5 ng/mL, with only 10% of BPH patients having PSA levels greater than 10 ng/mL. In contrast, prostate cancer patients had a significantly higher average PSA level of 12.0 ng/mL, and 70% of these patients exhibited PSA levels exceeding 10 ng/mL.

Table 3

PSA Levels in BPH and Prostate Cancer Patients

| Condition	Average PSA Level (ng/mL)	PSA > 10 ng/mL (%)
BPH Patients	4.5	10%
Prostate Cancer Patients	12.0	70%

In the 40-59 years age group, 40% of BPH patients and 30% of prostate cancer patients were represented. For the 60-64 years group, 60% of BPH patients fell into this category, while only 20% of prostate cancer patients did. Notably, 70% of prostate cancer patients were aged 65 years or older, whereas no BPH patients were in this age group. Smoking was more common among prostate cancer patients (60%) compared to BPH patients (40%), and obesity (BMI > 30) was also higher in prostate cancer patients (50%) than in BPH patients (35%).

Table 4

Distribution of Risk Factors (Age, Smoking, Obesity) by Condition

Risk Factor	BPH Patients(%)	Prostate Cancer Patients (%)	Total (%)
Age 40-59 years	40%	30%	35%
Age 60-64 years	60%	20%	40%
Age ≥65 years	0%	70%	25%
Smokers	40%	60%	50%
Obesity (BMI > 30)	35%	50%	45%

Figure: 3

Comparison of Risk Factors Between BPH and Prostate Cancer Patients
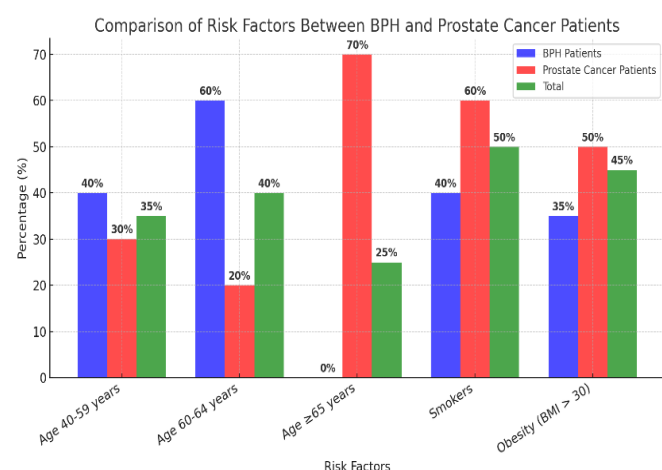
DISCUSSION

The results of this study provide important insights into the prevalence, risk factors, and diagnostic markers associated with Benign Prostatic Hyperplasia (BPH) and prostate cancer among adult males. The study followed 125 patients whose condition primarily consisted of BPH at 64% whereas only 20% had prostate cancer. Sixteen percent of patients in this sample had various prostate anomalies such as prostatitis and urinary tract infections. Research confirms that prostatic hyperplasia exists as the major prostate condition affecting older men. In the examined patient population, the principal factor that increases the risk of both BPH and prostate cancer is patient age. A high proportion of 60-year-old-and-older patients were represented in both the BPH (60%) and prostate cancer (70%) groups of our research sample. Research indicates that both conditions demonstrate higher instances with advance in age. The primary cause of BPH appears when male hormonal changes increase levels of DHT leading to prostate tissue enlargement with age [14]. Early detection and monitoring prove essential for men older than 65 since prostate cancer mostly affects patients in this demographic. The research revealed that prostate cancer has significant family links because 50% of patients with the disease indicated a family background of prostate cancer [15]. This result confirms genetic vulnerability to prostate cancer. Male individuals who have relatives with prostate cancer face an elevated risk of developing this disease. A family history of the disease represents a powerful known risk element for prostate cancer. BPH patients with a family background showed a lower occurrence compared to prostate cancer patients with family histories. The percentage was 25% in the BPH patient group [16]. Analyses indicate that BPH carries both genetic elements yet hormone changes and lifestyle choices appear as major contributors in its development. The screening method through Prostate-specific antigen (PSA) evaluation remains well-known for prostate condition detection and diagnosis purposes [17]. The PSA level measurement from prostate cancer patients indicated 12.0 ng/mL as their average which exceeded the 4.5 ng/mL value measured in BPH patients. This research study succeeds in revealing BPH and prostate cancer incidence patterns yet several important limitations exist regarding the results. The research sample composed of 125 patients delivers important findings yet presents a limited statistical significance because it fails to represent the complete population. The findings of this study cannot be directly applied to diverse populations across different regions and healthcare settings because it was performed in just one area.

CONCLUSION

It is concluded that Benign Prostatic Hyperplasia (BPH) and prostate cancer are prevalent conditions among adult males, with BPH being more common than prostate cancer in this study. Age, family history, smoking, and obesity were identified as significant risk factors for both conditions. The majority of BPH patients were older adults, particularly in the age group of 60 years and

above, which is consistent with existing literature. Similarly, prostate cancer also showed a higher incidence in older men, and a family history of prostate cancer was strongly associated with an increased risk.

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