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Surgery

Feature and Presentations of Suspected Harboring Prostate Cancer Patients: A Study in a Tertiary Care Hospital in Bangladesh

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Abstract **Original Research Article**

Background: Prostate cancer is the most common cancer in males of increasing age. It is the second leading causes of cancer mortality among the men throughout the world. There are many etiological factors are associated with increased the risk of prostatic carcinoma including male hormone and its active metabolites, genetic predisposition, environmental factors, racial difference, food habits etc. A pathway with an imaging test may decide which men with an elevated PSA and/or suspected digital rectal examination will undergo biopsy. ***Aim of the study:*** The aim of this study was to assess the feature and presentations of suspected harboring prostate cancer patients. ***Methods:*** This was cross- sectional analytical study conducted in the Department of Urology, Sir Salimullah Medical College & Mitford Hospital, Dhaka, Bangladesh during the period from July 2018 to June 2020. A total of 50 male patients had undergone mpMRI of prostate and TRUS biopsy and histopathology were enrolled in this study as study population. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 22.0. ***Results*:** In this study, the mean age of the participants was found as 69.14±8.48 years. The most frequent complaint of them was frequency of urination in 84%. The mean S. PSA was found as 41.78 ± 28.097 ng/ml. More than one third (38%) of patients were found to have volume of prostate 41-60 cc and the mean volume was found as 57.26 ± 19.026 cc. The mean PI-RADS score of our respondent was 3.32±1.34 ranging from 1 to 5. As mpMRI of prostate, majority (36%) patients had PI-RADS: 4. As per the histopathological diagnosis, it was found that, 34% of study patients were diagnosed as benign nodular hyperplasia. On the other hand, remaining 66% were diagnosed as carcinoma of prostate. In this study, the range of Gleason scores of the participants was found as 6-10. ***Conclusion:*** PI-RADS score, mpMRI and S. PSA assessment may be considered as some prominent evaluation methods for detecting and assessing harboring prostate cancer. Pre-conceptions regarding the feature and presentations of suspected harboring prostate cancer patients may be helpful in diagnosis as well as in the management of harboring prostate cancer.

Keywords: Prostate, Cancer, mpMRI, Carcinoma, S. PSA.

INTRODUCTION

Prostate cancer is the most common form of malignancy and the second leading cause of cancer death among men [1]. Currently, more than 40,000 new cases are being diagnosed every year in the UK [2]. In 2014, an estimated 233,000 new cases of prostate cancer were diagnosed in the United States [3]. Worldwide, in the year of 2018, number of new cases of prostate cancer was 1,276,106 and number of deaths from prostate cancer was 358,989 [4]. For a diagnostic prostate biopsy, the 12-core TRUS guided prostate biopsy is the preferred and current standard of care technique [5]. TRUS-biopsy can over-diagnose clinically insignificant prostate cancer due to random deployment of the needles [6]. On the other hand, TRUS guided biopsies may miss prostate cancers having an estimated false negative rate of 16.6% [7]. In these circumstances, a new diagnostic pathway can be proposed in which an imaging test can be performed among men at risk of prostate cancer to decide which

patient should have or not have a prostate biopsy. At present, multi-parametric MRI (mpMRI) appears to have all the desired attributes of a test that could be used in the prostate cancer diagnostic pathway [8]. mpMRI into the diagnostic pathway as an initial test prior to prostate biopsy may (1) reduce the proportion of men having unnecessary biopsies, (2) improve the detection of prostate cancer and (3) increase the cost-effectiveness of the prostate cancer diagnostic and therapeutic pathway [9]. Although, magnetic resonance imaging (MRI) has been evaluated for staging prostate cancer for many years [10] the technology has recently improved dramatically. Improvements in the design and application of multi-parametric MRI have increased the ability to identify and localize prostate cancer. However, the diagnosis and histopathologic grading of prostate cancer still requires tissue for diagnosis. The reference standard for the diagnosis of prostate cancer remains tissue biopsy [11]. Multi-parametric MRI has been reported to have high sensitivity and specificity for high-grade prostate cancers and thus could be of value in reducing disease misclassification [12]. Men who underwent mpMRI and subsequent radical prostatectomy are reported that mpMRI had the lowest misclassification rate of prostate cancers [13]. TRUS-biopsy and histopathology can be the one in such cases. In this country, the performance of mpMRI as a diagnostic tool is not yet tested.

OBJECTIVE

The objective of this study was to assess the feature and presentations of suspected harboring prostate cancer patients.

METHODOLOGY

This was a cross-sectional analytical study conducted in the Department of Urology, Sir Salimullah Medical College & Mitford Hospital, Dhaka, Bangladesh during the period from July 2018 to June 2020. A total of 50 male patients had undergone mpMRI of prostate and TRUS biopsy and histopathology were enrolled in this study as study population. The study was approved by the ethical committee of the Sir Salimullah Medical College Mitford Hospital. Proper written consents were taken from all the participants before data collection. The whole intervention was conducted in accordance with the principles of human research specified in the Helsinki Declaration [14] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [15]. As per the inclusion criteria of this study, patients with an elevated S. PSA (more than 4 ng/ml) and suspicious nodule or nodules in digital rectal examination were included. On the other hand, according to the exclusion criteria of this study, patients with previous history of prostate surgery or treatment for prostate cancer or prostate biopsy or acute prostatitis within the last 3 months, cases with evidence of a urinary tract infection or abnormal coagulation profiles or contraindication to MRI or medical conditions were excluded. Moreover, patients with uncontrolled DM, old debilitated person and patients with known hypersensitivity to contrast medium were excluded. All the demographic and clinical data of the participants were recorded. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 23.0 program as per necessity.

RESULT

In this study, the mean age of the participants was found as 69.14±8.48 years ranging from 52 to 95 years. Majority of the patients were found from 61-80 year's age range. Among total patients, the most frequent complaint was frequency of urination (84%), followed by poor flow of urine (78%), intermittency (44%), urgency (42%) and some other less frequent events. Majority (28%) of our patients had S. PSA 4-20 ng/ml. The mean S. PSA was found 41.78± 28.097 ng/ml ranging from 8.8 to100 ng/ml. In this study, more than one third (38%) of patients were found to have volume of prostate 41-60 cc. The mean volume of prostate by mpMRI was found 57.26±19.026 cc ranging from 29 to 113 cc. The mean PI-RADS score of our respondent was 3.32±1.34 ranging from 1 to 5. As mp MRI of prostate, majority (36%) patients had PI-RADS: 4, followed in decreasing order by PI-RADS: 5(20%), PI-RADS: 2(16%), PI-RADS: 1(14%) and PI-RADS: 3(14%). As per the histopathological diagnosis, it was found that, 34% of study patients were diagnosed as benign nodular hyperplasia. On the other hand, remaining 66% were diagnosed as carcinoma of prostate. In this study, the range of Gleason scores of the participants was found as 6-10.

Table 1: Distribution of the study patients by age (N=50)

Age (years)	n	%
≤60 yrs.	7	14%
61-70 yrs.	22	44%
71-80 yrs.	19	38%
>80 yrs.	2	4%
Mean ±SD	69.14 ±8.48	
Range (min-max)	52-95 Age	

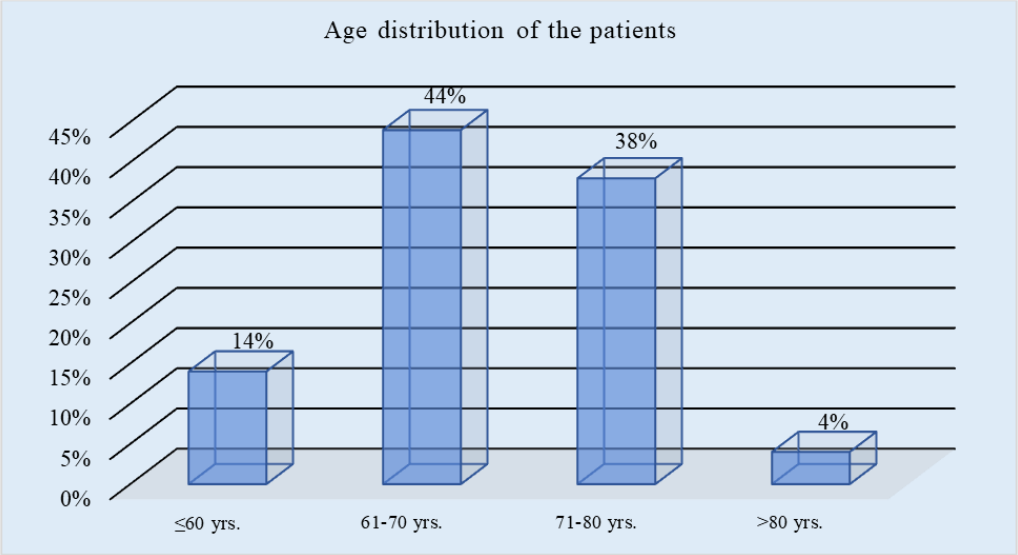

Figure I: Column chart showed age wise patients distribution (N=50)

Table 2: Distribution of study patients by clinical presentation (N=50)

Clinical presentation	n	%
Frequency	42	84%
Poor flow of urine	39	78%
Intermittency	22	44%
Urgency	21	42%
Hesitancy	19	38%
Nocturia	18	36%
Straining	12	24%
Incomplete emptying	10	20%
Retention of urine	5	10%
Back pain	4	8%
Lower abdominal pain	2	4%
Hematuria	2	4%
Weight loss	1	2%

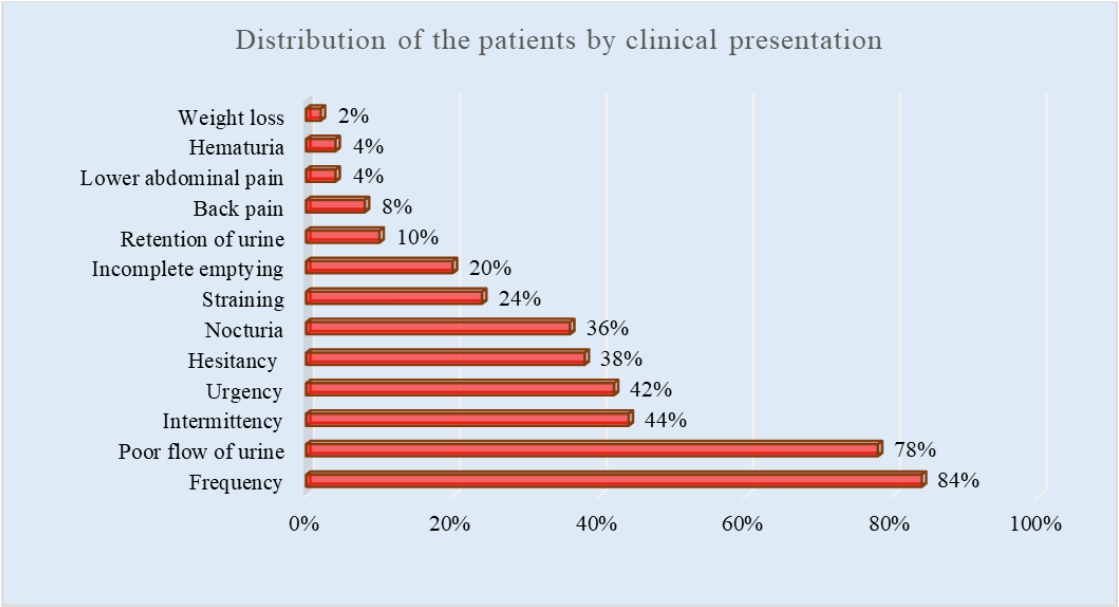

Figure II: Bar chart showed clinical presentation Among the Patients (N=50)

Table 3: Distribution of the study patients according to S. PSA (N=50)

S. PSA (ng/ml)	n	%
20-4	14	28
21-40	13	26
41-60	9	18
61-80	6	12
81-100	8	16
Mean ±SD	41.78 ± 28.097	
Range (min-max)	8.8-100 ng/ml	

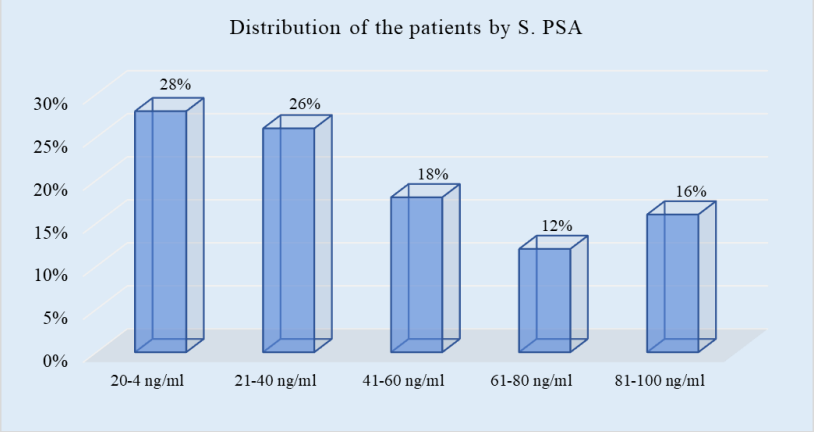

Figure III: Column chart showed S. PSA wise patients distribution (N=50)

Table 4: Distribution of the study patients according to volume of prostate by mpMRI (N=50)

Volume by mpMRI (cc)	n	%
21-40	13	26
41-60	19	38
61-80	10	20
>81	8	16
Mean ± SD	57.26 ± 19.026	
Range (min-max)	29.0 -113.0 cc	

Table 5: PI-RADS scores of study patients by mpMRI (N=50)

mpMRI findings	n	%
PI-RADS 1	7	14
PI-RADS 2	8	16
PI-RADS 3	7	14
PI-RADS 4	18	36
PI-RADS 5	10	20

Table 6: Histopathological diagnosis of study patients (N=50)

Histopathological diagnosis	n	%
Benign nodular hyperplasia	17	34%
Carcinoma of prostate	33	66%

Table 7: Distribution of Gleason score of patients with prostate cancer (n=33)

Gleason score	n	%
6.0 (3+3)	6	18.18
7.0 (3+4)	7	21.21
7.0 (4+3)	6	18.18
8.0 (4+4)	7	21.21
9.0 (5+4)	4	12.12
10.0 (5+5)	3	9.09
Range (min-max)	6.0-10.0	

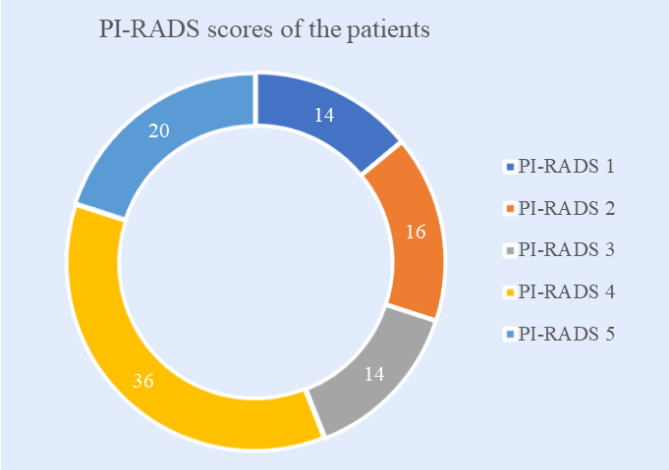

Figure IV: Ring chart showed PI-RADS scores of patients by mpMRI (N=50)

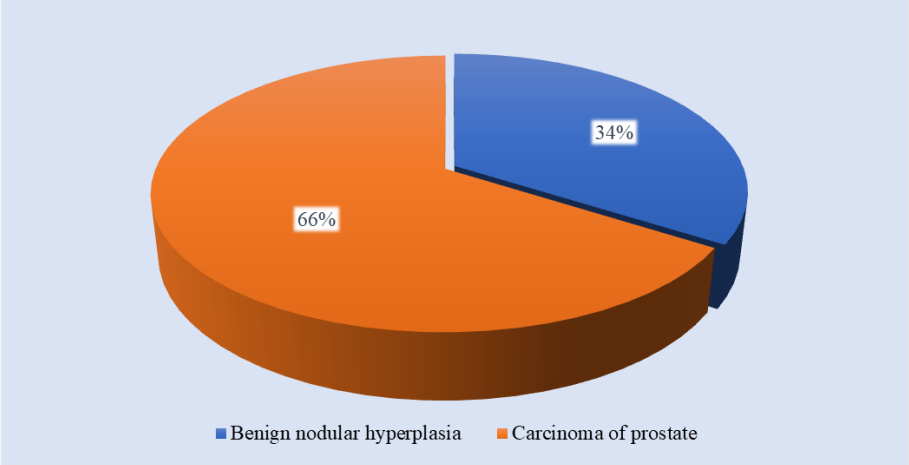

Figure V: Pie chart showed histopathological diagnosis of the patients (N=50)

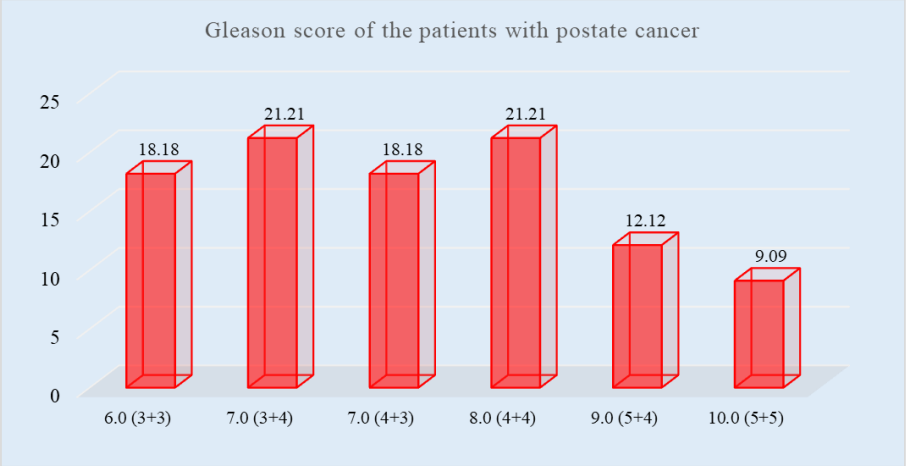

Figure VI: Column chart showed Gleason score of patients with prostate cancer (n=33)

DISCUSSION

In this present study, among total participants, the mean age was found as 69.14±8.48 years, ranging from 52 to 95 years. In Italy found the mean age was 63.1±6.2 years. Siddiqui *et al.*, [16] in England reported that, the mean age was 62.1±7.5 years. In this study, it was observed that, the mean S. PSA of our patients was 41.78±28.097 ng/ml, ranging from 8.8 to 100 ng/ml, however majority (28%) of patients had S. PSA 4-20 ng/ml. In the study done by Thompson *et al.*, [17], it was observed that, the PSA was ranging from 4.5 to7.5 ng/ml. In another study by Porpiglia *et al.*, [7] the mean

(SD) S. PSA was found 5.87±2.1 ng/ml. These observations are not consistent with the findings of present study, possibly due to presence of annual Prostate cancer screening program in western countries. It was evident from the study that; the mean volume of prostate was found 57.26±19.026 cc ranging from 29.0 to 113.0 cc. However, majority (38 %) of patients had volume of prostate 41-60 cc. Siddiqui *et al.,* [16] study showed that, the mean prostate volume was 49 cc with ranging from 36-71 cc. In the study by Hoeks *et al.,* [12] the preoperative range of prostate volume was 38 to 66 cc. mpMRI of prostate findings of this study showed that, majority (36%) patients had PI-RADS 4, followed in decreasing order by PI-RADS 5 (20%), PI-RADS 2(16%), PI-RADS 1(14%) and PI-RADS 3(14%). The study by Abd-Alazeez *et al.,* [18] in UK showed that, PI-RADS 2(36%) was followed in decreasing order by PI-RADS 3(32.4%), PI-RADS 4(21.3%), PI-RADS 5(10.2%) and PI-RADS 1(0%). Almost similar proportion of negative and positive group of mpMRI was observed in present study. In this study, it was observed that, about one third (34%) of the patients had benign nodular hyperplasia and two third (66%) patients had carcinoma of prostate. Almost similar observation was reported by Thompson *et al.,* [17] in Australia. Study by Abd-Alazeez *et al.,* [18] in UK showed that, 52.7% of the patients had benign nodular hyperplasia and 47.22% patient had carcinoma of prostate. Unlike in another study, by Lista *et al.,* [19], it was observed that, 81.3% of the patients had benign nodular hyperplasia and 18.7% patient had adenocarcinoma of prostate and these cases were diagnosed with mpMRI after having initial negative prostate biopsy.

Limitation of the Study

This was a single centered study with small sized samples. Moreover, the study was conducted at a very short period of time. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION & RECOMMENDATION

PI-RADS score, mpMRI and S. PSA assessment may be considered as some prominent evaluation methods for detecting and assessing harboring prostate cancer. Pre-conceptions regarding the feature and presentations of suspected harboring prostate cancer patients may be helpful in diagnosis as well as in the management of harboring prostate cancer. For getting more specific results, we would like to recommend for conduction similar more studies in several places with larger sized samples.

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