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Clinicoepidemiological Profile and Primary Treatment Modality of Prostate Cancer: A Single Centre Study

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Abstract:

Introduction: *The incidence and treatment of prostate cancer shows variation across the globe. The clinic-epidemiological profile of this disease have been extensively studied in many countries, data regarding this in West Bengal is limited.*

Aims: *To describe the clinic-epidemiological characteristics of prostate cancer and the primary treatment modality in PCa patients in a single tertiary care centre.*

Materials And Methods*: Data were collected prospectively from all patients with newly diagnosed prostate cancer and managed in urology department of Nil RatanSircar Medical College, Kolkata, from January 2018 to January 2019 (n=41). DRE, serum PSA, USG prostate, andT-99 bone scan was done in all patients. Patient's age, clinical presentation, prostate specific antigen (PSA) level, mode of diagnosis, Gleason score, stage of the disease, addiction and main modality of treatment were recorded and analysed.*

Results: *Study showed differences in disease characteristics, epidemiology and treatment of prostate cancer in India from global trend.*

Conclusion: *India has a growing number of cases of prostate cancer in the years to come, and the changing socioeconomic status of the patients, adequate population-based data regarding the demography and disease characteristics, and acceptable treatment modalities are of utmost importance.*

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I. Introduction:

Prostate cancer (PCa) is the second most common diagnosed cause of cancer and the fifth leading cause of cancer death among men worldwide. Overall it is the 4th most common diagnosed cause of cancer (7.1% incidence).[1,2]Prostate is the second leading site of cancer among males in large Indian cities like Delhi, Kolkata, Pune and Thi'puram, third leading site of cancer in cities like Bangalore and Mumbai and it is among the top ten leading sites of cancers in the rest of the (population based cancer registries) PBRCs of India.[3]The incidence rates of this cancer are constantly and rapidly increasing in all the PBRCs. The PBCRs at Bangalore (Annual percent change: 2.82%), Chennai (4.13%), Delhi (3.36%) and Mumbai (1.17%) recorded a statistically significant increasing trend in incidence rates over time. The cancer projection data shows that the number of cases will become doubled by 2020.[3,4,5,6]

Prostate cancer incidence varies by race/ethnicity, with African-Americans experiencing 59% higher incidence rates than whites.[1,2,7] Men of Asian descent living in the United States have a lower incidence compared to white Americans, but their risk is higher than that of men of similar backgrounds living in Asia indicating external factors (dietary, lifestyle, environmental) in the development of prostate cancer.[1,2,7,8]

Increased migration of rural population to the urban areas, changing life styles, increased awareness, and easy access to medical facility, more cases of prostate cancer are being diagnosed in India and we are not very far behind the rate from western countries.[8]

Screening is seldom used to identify PCa in India. Consequently, the disease is not identified until in its later stages.

The use of PSA as a screening test has had the greatest impact on the incidence and potentially the mortality of prostate cancer worldwide.[8]It has induced a significant downward migration in age and stage (both clinical and pathologic) at diagnosis. PSA screening may have a beneficial effect on prostate cancer mortality; however, the absolute effect is small relative to the number needed to screen and treat to cure a single individual.[8]

Early detection can lead to overtreatment of prostate cancers that do not threaten life expectancy, which results in unnecessary side effects that impair quality of life (QOL) and increase health care expenditures. The U.S. Preventive Services Task Force (USPSTF) recommended against PSA testing in 2012.[9] The incidence of

metastatic disease has increased. Increases in the incidence of metastases at presentation and in prostate cancer deaths may be influenced by declines in the rates of prostate cancer early detection, biopsies, diagnosis of localized prostate cancers, and radical prostatectomy that followed the 2012 USPSTF recommendations.[10]The USPSTF released updated recommendations in 2018 that include individualized, informed decision-making regarding prostate cancer screening in men aged 55 to 69 years.[11,12]

The marked difference between prevalence and incidence rates of prostate cancer, and morbidity and mortality rates, has led some to conclude that many prostate cancers are harmless and should better be left undetected. If the present trends of increasing life expectancy continues, given the current age-specific incidence, morbidity, and mortality rates of prostate cancer, this disease will become a far greater public health problem in the future. Knowledge of clinic-epidemiological profile of PCs is very important in helping policy makers and concerned authorities to plan and formulate sound cancer control strategies and formulate appropriate management protocols.

Patients with prostate cancer (PCa) may present with localized (80% of patients), locally advanced (10–15% or patients), or distant metastatic disease. Advanced disease may present de novo at initial presentation (approximately 4–5% of new diagnoses) or as progression following definitive therapy for localized disease.[8] Since the introduction of PSA testing, 81% of newly diagnosed men have localized disease, whereas the incidence of metastatic disease has decreased by 75%.[13] Non-palpable cancers (AJCC clinical stage T1c) now account for 60% to 75% of newly diagnosed disease.[14] Clinical stage migration has also been associated with improvements in 5-year disease-specific survival, which is 99.2% overall and 28% for men with advanced disease[15, 8].

The average age of diagnosis is 66; the disease rarely occurs before age 40. Currently, the proportion of men diagnosed with prostate cancer by age is 10.1%, 30.7%, 35.3%, 19.9%, and 4.4% for men less than 55 years, 55 to 64 years, 65 to 74 years, 75 to 84 years, and greater than 84 years, respectively.[16, 8] While age-specific incidence rates decline after age 70, the risk of prostate cancer death increases throughout life. The average age of death from prostate cancer is 77 years and has remained stable over the last three decades.[17, 8]

In USA Gleson score <=6 comprises of 53.6% patients.[22]

ADT is administered as primary systemic therapy for regional or advanced disease and as neoadjuvant/concomitant/adjuvant therapy in combination with radiation in localized or locally advanced prostate cancers. LHRH analogues (i.e. antagonists or agonists) are the most frequently used method of androgen deprivation therapy (ADT). Recent evidence suggests that orchiectomy may be safer than an LHRH agonist. Four hundred twenty-nine men with metastatic prostate cancer who underwent orchiectomy were compared with 2,866 men who received LHRH agonist between 1995 and 2009.[12] Orchiectomy was associated with lower risk of fracture, peripheral arterial disease, and cardiac-related complications, although risk was similar for diabetes, deep vein thrombosis, pulmonary embolism, and cognitive disorders.[12] Though orchiectomy has more of adverse psychological effects.[12, 8] In two studies that offered orchiectomy versus medical therapy for ADT, 70% of patients chose medical therapy.[21]

Cigarette smoke may be a risk factor for prostate cancer because it is a source of cadmium exposure, it increases circulating androgen levels, and it causes significant cellular oxidative stress[8]. Current smokers are at higher risk of biochemical recurrence, metastasis, and prostate cancer–specific mortality than non-smokers across all treatment modalities even when intensity of screening is accounted for.[18, 19, 8.]

The most convincing evidence for the role of diet and other environmental factors in modulating prostate cancer risk comes from migration studies showing an increased incidence of prostate cancer in first-generation immigrants to the United States from Japan and China.[20]

AIMS: To describe the clinic-epidemiological characteristics of prostate cancer and the primary treatment modality in PCa patients in a single tertiary care centre.

II. Material And Method:

Data were collected prospectively from all patients with newly diagnosed prostate cancer and managed in urology department of Nil RatanSircar Medical College, Kolkata, from January 2018 to January 2019 (n=41). Patient's age, clinical presentation, prostate specific antigen (PSA) level, USG whole abdomen, Tc99 bone scan, DRE, Gleason score, stage of the disease, addiction, dietary habit and main modality of treatment were recorded and analysed. Approval for the study was obtained from the Ethics Committee of the Institute.

III. Results:

Mean age at diagnosis is 69.4yrs (range: 55-85) overall, while it was 69.73 in patients with metastasis, in a predominantly non-vegetarian diet population. 75.6% (n=31) of the patients had metastatic disease at presentation (most commonly at DL spine: 73.3%).Main presenting complain was LUTS (100%), AUR (14.6%, n=6), Back ache (41.9% of patients with metastasis, n=13), and Haematuria (9.7%, n=4). There was no patient diagnosed on screening. 12.2% (n=5) patients were diagnosed post TURP for clinically BPE. Mean gland size

was 42.95gm (range: 23-65) overall, while in patients with metastasis it was 45.53gm. Mean serum PSA was 106.2ng/ml (range: 2.5-461) overall, while in patients with metastasis it was 123.9ng/ml (range: 15-461). Mean Gleason score was 7.95 (range: 6-9) overall, while it was 8.33 (range: 7-9) in patients with metastasis. 85.36% (n=35) patients had nodularity on DRE. 93.5% (n=29) patients with metastasis received orchiectomy as primary treatment, while only 6.45% (n=2) received LHRH agonist. Amongst patient with localized prostate cancer 60% (n=6) received radical radiotherapy and 40% (n=4) underwent radical prostatectomy as primary treatment. 24.4% patients had hypertension, 14.6% had diabetes, and other comorbidities were COPD and IHD.48.8% of the patients were smokers.

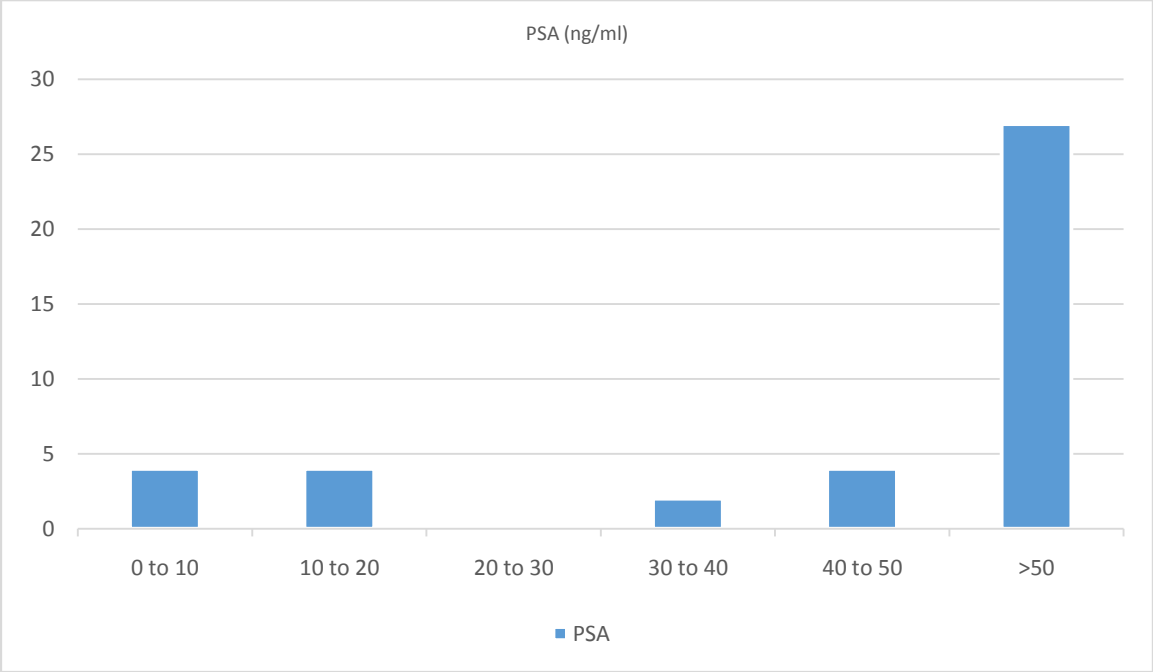

Fig 1

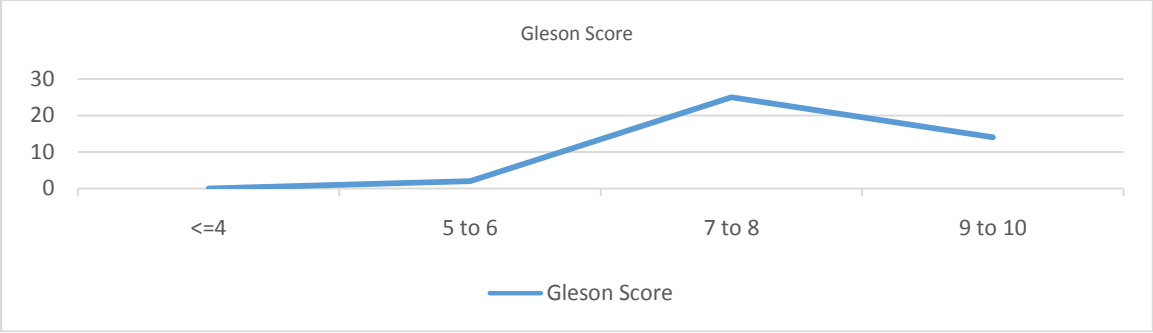

Fig 2

CHARACTERISTICS	n(%)
Average age (yrs)	69.4
Clinical presentation	
LUTS	41 (100%)
Hematuria	4 (9.7%)
AUR	6 (14.6%)
Features of metastasis	13 (31.7%)
Prostate size (gm)	
<20	0
20-40	21 (51.2%)
40-60	18 (43.9%)
>60	2 (4.9%)
PSA level at diagnosis (ng/ml)	
<10	4 (9.7%)
10-20	4 (9.7%)
20-30	0
30-40	2 (4.9%)

40-50	4 (9.7%)
>50	27 (65.85%)
Gleason sum score	
<=4	0
5-6	2 (4.9%)
7-8	25 (61%)
9-10	14 (34.1%)
Mode of diagnosis	
Suspicion for prostate cancer	37 (90.2%)
Screening	0
TURP for clinical BPE	4 (9.7%)
Treatment received	
Radical prostatectomy	4 (9.7%)
Radical radiotherapy	6 (14.6%)
Orchiectomy	29 (70.7%)
LHRH agonist	2 (4.9%)

Table 1: Patient and tumour characteristics, and treatment received. LUTS=Lower urinary tract symptoms, PSA=Prostate specific antigen, TURP=Transurethral resection of the prostate

IV. Discussion:

Average age at diagnosis was 69.4 years in our study which is comparable to global trend of 66 years.75.6% patients presented with metastatic disease compared to 5% to 10% globally. Non-palpable cancers (AJCC clinical stage T1) now account for 60% to 75% of newly diagnosed disease, while in our study there were only 9.7% patients diagnosed in this way and none were diagnosed on screening. In USA Gleson score <=6 comprises of 53.6% patients while in our study only 4.9% patients had Gleson score <=6[22]. LHRH analogues (i.e. antagonists or agonists) are the most frequently used method of androgen deprivation therapy (ADT), while in our study orchiectomy was the most common method of ADT.

V. Conclusion:

India has a growing number of cases of prostate cancer in the years to come, and the changing socioeconomic status of the patients.Adequate population-based data regarding the demography and disease characteristics, and acceptable treatment modalities are of utmost importance.

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