ELSEVIER

Urologic Oncology: Seminars and Original Investigations 31 (2013) 325–330

UROLOGIC ONCOLOGY

Original article

Clinicopathologic features and determinants of Gleason score of prostate cancer in Ghanaian men

Joel Yarney, M.B. C.H.B., F.C.Rad.Onc.(S.A.)[a,*],
Verna Vanderpuye, M.B. C.H.B., F.W.A.C.S.[a], James Mensah, M.B. C.H.B., F.W.A.C.S.[b]

[a] *National Center for Radiotherapy and Nuclear Medicine, Korle Bu Teaching Hospital, Accra, Ghana*
[b] *Department of Surgery/Urology, Korle Bu Teaching Hospital/University of Ghana Medical School, Accra, Ghana*

Abstract

Objective: Prostate cancer is reported to be more aggressive in Blacks. We studied the clinicopathologic features of prostate cancer in Ghana, in order to determine the factors responsible for them and to find out if there is any relationship between them.

Method: Patients referred with a biopsy proven diagnosis of carcinoma of the prostate to the Cancer Center of Korle Bu Teaching Hospital, Accra, Ghana, from 2003 to 2007 were studied. Information with respect to age at diagnosis, presenting symptoms, initial PSA (iPSA), Gleason score, and disease extent were studied. Age was partitioned into 50–65 and >65 years, Gleason score into 2–6, 7, and 8–10, iPSA into 4–20 ng/ml and >20, and disease extent into T1, T2, vs. T3, T4, M1, and the relationship between them was determined. Various presenting symptoms were described. Known risk factors and screening in a context of high grade disease is discussed.

Results: A total of 170 patients were studied. Mean age was 65.4 years. Majority of patients (73.7%) presented with an iPSA > 20 ng/ml, whilst 22 (14.1%) had PSA < 10 ng/ml. Gleason score ≥ 7 was found in 95 (56%) of patients. Asymptomatic patients constituted 24.0%, the rest had bone pain (22.6%), urinary (50.4%), and neurologic symptoms (3.0%).There was a statistically significant relationship between age and Gleason score ($P = 0.049$), PSA and Gleason score ($P = 0.0001$), and between extent of disease and Gleason score ($P = 0.0002$). High fat diet and low intake of fruits and vegetables are probable risk factors in Ghana.

Conclusion: Majority of patients present with symptomatic disease at a relatively older age. These patients tend to have high Gleason score partly attributable to advanced disease, age, PSA at the time of diagnosis, and race. Screening with PSA should be recommended and individualized in this group of patients in order to allow diagnosis of less aggressive disease until better screening tools are identified.

Keywords: Prostate; Cancer; Gleason score; Differentiation; Age; PSA; Risk factors; Black men

Introduction

There are conflicting reports in the literature in relation to the behavior of prostate cancer in people of African descent with majority of reports indicating a more aggressive disease in this group of people compared with others [1–4]. Whether this is a function of advanced disease, allowing time for tumor dedifferentiation and, therefore, higher Gleason score (a measure of tumor aggression), or an inherent feature is not well understood [5].

We therefore set out to determine the clinical features of age at presentation, symptom complex at presentation, as well as distribution of pathologic features of disease extent, Gleason score, and initial prostate specific antigen (iPSA), among patients referred to the Korle Bu Teaching Hospital, the largest hospital in the country, and also the relationship between Gleason score and disease extent, iPSA, and age, since we believe it will cast more light on the behavior of the disease in this category of patients. We also examined the prevalence of known risk factors for prostate cancer in our setting with particular reference to those who may be responsible for aggressive disease, and attempted to make recommendations for reducing the burden of disease, including prevention and early detection.

Method

All patients referred with a biopsy proven diagnosis of carcinoma of the prostate to the Cancer Center of Korle Bu

* Corresponding author. Tel.: +233 302676222; fax: +233 302676221.
E-mail address: kodwoahen@gmail.com (J. Yarney).

1078-1439/$ – see front matter
doi:10.1016/j.urolonc.2011.01.018

Teaching Hospital in Accra, Ghana, from 2003 to 2007 and with at least 2 of the following, T stage, Gleason score, and iPSA, were eligible for study. Information with respect to age at diagnosis, presenting symptoms, iPSA, Gleason score, and T stage were gleaned from patients' charts. The sixth edition of UICC TNM Classification of Malignant Tumours, 2002, was adopted for staging purposes.

The extent of disease at the time of diagnosis was subdivided into T1 (clinically unapparent tumor not palpable or visible on imaging), and T2 (tumor confined to prostate) on one hand, and T3 (tumor extends through prostatic capsule), T4 (tumor is fixed or invades adjacent structures other than seminal vesicles; bladder neck, external sphincters, rectum, levator muscle, or pelvic wall), and M1 (distant metastasis) on the other, for the purpose of comparison with Gleason score, which was subdivided into 2–6, 7, and 8–10. In order to compare age with Gleason score, we partitioned it into 50–65, and above 65 years. This was based on the mean age of 65.4 years for the group examined. We also divided iPSA into 4–20 and more than 20 in order to compare it with Gleason score. M1 status was determined either by conventional radiography, ultrasound, or bone scintigraphy.

The data were analyzed using PHSTAT2 (Prentice Hall Inc., Upper Saddle River, NJ) software and relationships between categorical parameters were determined using X^2 statistic. This was the preferred choice for analysis because of the group categorization employed with respect to age, PSA, and Gleason score. These tests were one-tailed with $P < 0.05$ as the chosen level of significance. Clinical presentation was grouped into urinary, neurological, bone pain, and routine testing. A literature review of the risk factors for prostate cancer was performed and juxtaposed against what pertains in our environment. We also examined available literature with respect to screening for potential high risk disease, as we believe it is prevalent in our setting. No clinical interventions were made in the study.

Results

Data from 170 patients were analyzed, and age distribution is shown in Table 1, with peak incidence occurring in the 60–69 year age group, comprising 41.8%; mean age at presentation was 65.4 years with a range of 50–87 years. Majority of patients (73.7%) presented with an initial PSA greater than 20 ng/ml, 19 patients, representing 12.2%, had PSA between 10 and 20 ng/ml, whilst 22, representing 14.1%, had PSA less than 10 ng/ml.

Table 1
Age distribution

Age group	Number	Percentage
50–59	46	27.1
60–69	71	41.8
70–79	49	28.8
80–89	4	2.4
Total	170	

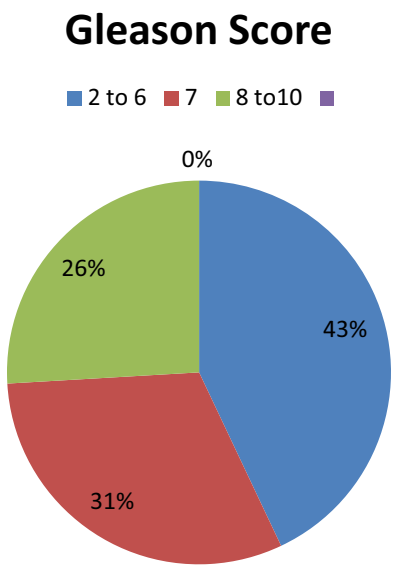

Fig. 1. Gleason score distribution. (Color version of figure is available online.)

Fig. 1 is a pie chart demonstrating distribution of Gleason score; 43% of patients presented with Gleason score 2–6. Gleason score of 7 and above was observed in 57% of patients. Asymptomatic patients constituted 24.0%, and the rest presented with bone pain (22.6%), urinary symptoms (50.4%), and neurological symptoms (3.0%).

A 2 × 2 contingency Table (2), testing relationship between tumor stage (T1, T2 and T3, T4) on one side vs. Gleason score (2–6, and 7–10) yielded a χ^2 value of 13.8 and P value of 0.0002. Table 2 was used to test the relationship between age and Gleason score. It generated a χ^2 test statistic of 3.87, corresponding to a P value of 0.0492. Examination of the relationship between Gleason Score and PSA resulted in a χ^2 test statistic of 14.84, corresponding to a P value of 0.0001.

Cancer of the prostate is the second leading cause of cancer-related death in males in Ghana, a Sub-Saharan African country, comprising 17.35% of deaths from cancer, and coming only after hepatocellular carcinoma [6]. The absence of a national cancer registry makes it impossible to

Table 2
Showing disease extent, age and PSA vs. Gleason score

Disease extent/Gleason score	2–6	7–10
T1,T2	27	14
T3,T4,M1	16	41
Age/Gleason score		
50–65	37	30
>65	21	41
PSA/Gleason score		
4–20	24	10
>20	29	61