

Is ethnicity a risk for high grade prostate cancer in South African men?

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OBJECTIVE

To assess the association between ethnicity and grade of prostatic adenocarcinoma, prostate-specific antigen (PSA) and age, and to determine whether Africans of African descent (AAD) have higher grade cancers than other ethnic groups.

SUBJECTS AND METHODS

We examined the association between ethnicity and Gleason score of 216 patients diagnosed with prostatic adenocarcinoma on transrectal biopsy at Grootte Schuur Hospital Department of Urology between January 2004 and May 2009 in a retrospective folder review. Age and PSA were also noted.

RESULTS

The mean age (SD) of the study population was 69.2 (8.21) years and median PSA (range) was 30.3 ng/ml (2.2-6363). The median PSA of Africans of African descent was 40.5 ng/ml (range 2.2-4367) and was significantly higher than the rest of the group 24.9 (range 2.7-6363), ($p=0.01$). The mean Gleason score (SD) of the population was 7.13 (1.50). The mean (SD) Gleason score of Africans of African descent was 7.50 (1.67) and for the remainder of the population 7.01 (1.42) which was a statistically significant difference ($p=0.038$).

CONCLUSION

We have shown a higher Gleason score and PSA in Africans of African descent. This study is limited by the low number of patients and disproportionately low number of white patients and African patients of African descent. A larger study is needed to confirm our findings.

KEYWORDS

prostate cancer, grade, black, high-risk, African

INTRODUCTION

African-Americans have been shown to have a higher risk for development of prostate cancer than white Americans. [1]. They also present with higher grade and stage prostate cancer than white Americans [2]. These disparities have been attributed to socio-economic and healthcare access factors as studies have shown no difference in outcome between African-Americans and white Americans in equal access health-care systems [3, 4]. However one recent study showed that African American men (with T1c and PSA<10 ng/ml) had a higher risk of Gleason score ≥ 7 , pT3/4, extra-capsular extension, positive surgical margins and PSA recurrence than

non-African Americans [5]. A high incidence of prostate cancer has been reported in other migrant African populations in Brazil, France and the Caribbean. [6-8]. In England the PROCESS study reported that black men had 3 times higher risk of prostate cancer than white men however their stage and survival were similar [9,10].

In Africa prostate cancer is not uncommon. Prostate cancer incidence shows a large regional variation across the continent and an upward trend [11-15]. Presentation in Africa is usually late with symptomatic disease rather than diagnosed by screening [16, 17]. South African men of African descent were reported to have higher overall incidence of prostate cancer (than other races) in one study however these men comprised only 4,5% of the study cohort [18]. This study also reported that Africans of African descent were less likely to accept prostate biopsy if recommended. Although prostate cancer was the commonest cancer in Africans of African descent according to the South African National Cancer Registry during 1998 and 1999, they had a four times lower risk of developing prostate cancer compared to white men. (17.2 per 100000 vs. 74.4 per 100000). The concern is raised that this may be due to under-reporting. No recent study which examined grade of prostate cancer in South African men of African descent could be identified. An older study by Bereczky from Natal, South Africa 1982-1994 which included 519 Africans of African descent reported a higher stage and Gleason grade compared to white patients in western publications [19]. It is therefore uncertain whether South African men of African descent have an elevated risk of high grade prostate cancer.

PATIENTS AND METHODS

A retrospective folder review of patients, who had trans-rectal prostate biopsy, at the Department of Urology, Groote Schuur Hospital from January 2004 to May 2009 was done. 216 patients with histologically confirmed adenocarcinoma of prostate on trans-rectal needle biopsy were identified. Most patients had sextant biopsies however cases after February 2008 had 12 core trans-rectal ultrasound-guided (TRUS) biopsies. Only patients where Gleason grade was reported were included. Most recent PSA done before biopsy, age at time of biopsy and race were recorded. Self-assigned race is recorded during our standard hospital admission procedure as black (African of African descent), coloured (mixed ancestry), white (European descent/ Caucasian) or Asian.

Mean Gleason score, age and PSA of Africans of African descent, coloured, white and Asian patients were compared. The Gleason score, age and PSA of Africans of African descent were also compared to the rest of the group.

Data was recorded using Microsoft Excel™ and analyzed using STATA® 11.0 and PAST© 2.02. The Student's ttest was used for comparison of data with normal distribution. Mann-Whitney test was used for data which did not have a normal distribution.

Careful consideration to ethical issues was given. Approval was granted for this study by our institutional Surgical Research Committee, Research Ethics Committee and by a hospital superintendent. Patient information and anonymity was safe-guarded by assigning a subject number (unrelated to name and file number) to each case.

RESULTS

One hundred and forty-three coloured patients (143), 54 Africans of African descent, 17 white patients and two Asians were included in the study (n=216) as illustrated in fig 1.

Mean age was 69.2 years (SD 8.21) and median PSA was 30.3ng/ml (range 2.2-6363) for the group. The median PSA (range) for Africans of African descent, coloured and white patients

respectively was 40.5 ng/ml (2.2-4367); 26.5 ng/ml (2.7-6363); 13 ng/ml (3.6-487) as shown in fig 2. The difference in PSA between Africans of African descent and the rest of the group was statistically significant ($p=0.01$, Mann-Whitney test). Figure 3 illustrates the PSA of Africans of African descent and the rest of the group in a box plot however a few outlier values above PSA 500 ng/ml have been excluded. The mean age of Africans of African descent, coloured and white patients was 71.5 (SD 10.05), 68.2 (SD 7.23), 69.4 (SD 9.18) years respectively as shown by table 1. The mean age of the group excluding Africans of African descent was 68.2 (SD 7.23). The difference in age between Africans of African descent and the rest of the group was statistically significant ($p=0.01$, Student's ttest).

Table 1. Mean age in years (SD) of ethnic groups.

Ethnicity	Mean age in years (SD)
AAD	71.5 (10.05)
White	69.4 (9.18)
Coloured	68.2 (7.23)

The mean Gleason score of the group was 7.13 (SD 1.50). The mean Gleason score for coloured men was 7.02 (SD 1.41), Africans of African descent 7.5 (SD 1.67), white men 7.05 (SD 1.56) and the two Asians both had a Gleason score of 6. The mean Gleason score for the group excluding Africans of African descent was 7.01 (SD 1.42). The difference in Gleason scores between Africans of African descent and the rest of the group was statistically significant ($p=0.038$, Student's ttest) as represented in fig 4.

DISCUSSION

The mean Gleason score is higher in Africans of African descent than the rest of the group and the difference is statistically significant. Africans of African descent had higher PSA values and were older than the rest of the group. The results of this study suggest that South African men of African descent may share the risk for higher grade disease which has been demonstrated in African American men. The higher PSA suggests that they present later in their disease which is in keeping with findings in other African countries. The lack of inclusion of stage at presentation is a weakness of this study as its inclusion may have confirmed whether the higher PSA was due to advanced disease alone or whether it was also affected by age differences.

The marked heterogeneity of the South African population should be considered. Due to mixed ancestry coloured men may share common factors with Africans of African descent which may make comparison with a larger white population more sensible. Our study was limited by the small number of white patients and Africans of African descent included which precluded the above-mentioned comparisons.

A large multicentre prospective study is needed to confirm our findings. Such a study may also indicate whether mixed ethnicity is associated with high grade disease.

The National Cancer registry concern about under-reporting of prostate cancer in Africans of African descent and the finding by Heyns et al. confirming that these men are less likely to accept prostate biopsy, suggests that this group requires further investigation and intervention.

High PSA at presentation across the group suggests that better education and primary care is necessary in our drainage area.

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FIGURES

Fig 1. Pie-chart representing racial distribution of men with prostate cancer (n=216)

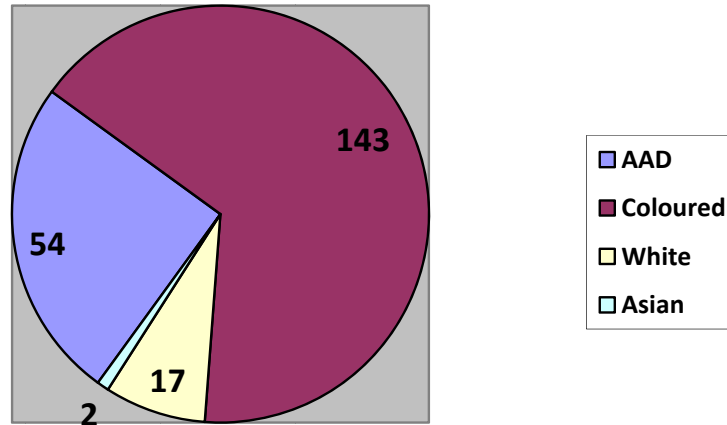


Fig 2. Bar graph representing mean and median PSA (ng/ml) for Africans of African descent (AAD), coloured and white men

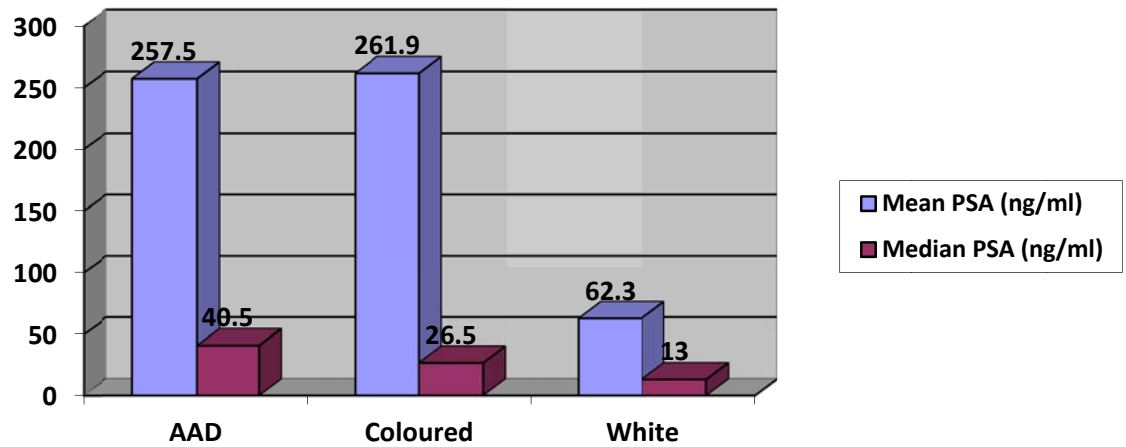


Fig 3. Box plot representing PSA (ng/ml) of Africans of African descent (Black) and the rest of the group (Outliers above PSA of 500 ng/ml have been excluded on this plot)

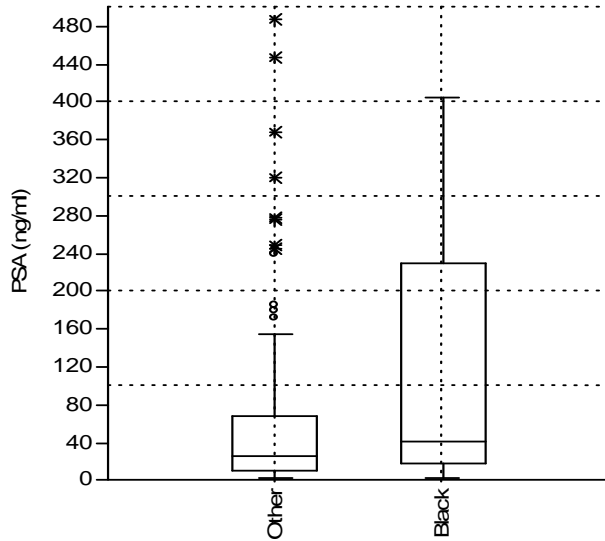


Fig 4. Box plot representing Gleason scores of Africans of African descent (Black) patients and the rest of the group

