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Prostate Cancer Under 40: A Case Report

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Abstract

Prostate Cancer (PCa) is a disease that primarily affects men older than 65 years of age. Early-onset PCa has been defined as PCa diagnosed \leq 55 years. There is scarce information on patients with prostate adenocarcinoma under 40 years, with approximately 25 published cases as of today. We present a case of prostate adenocarcinoma in a 39-year-old Puerto Rican male. To our knowledge, this is the first reported case of a Hispanic male with prostate adenocarcinoma under 40 years of age.

Keywords: Early-Onset Prostate Cancer; PSA Screening; Prostate Adenocarcinoma; Puerto Rican; Hispanic.

Abbreviations: PCa: Prostate Cancer, PR: Puerto Rico, PSA: Prostate Specific Antigen, SEER: Surveillance, Epidemiology, and End Results Program, TRUSP: Transrectal Ultrasound of Prostate, GWA: Genome-Wide Association

Introduction

Prostate Cancer (PCa) is the second most common type of cancer diagnosed in the United States (US). PCa represents the fifth leading cause of cancer-related death, with an estimated 268,490 new cases and 34,500 deaths to occur in 2022 [1]. In Puerto Rico (PR), PCa is the most diagnosed cancer type in men and is the third cause of death for the general population. In 2020, 2742 PCa cases were reported, representing 21% of all male cancers in PR [2]. PCa is the number one cause of cancer-related death in men in PR, with age-adjusted mortality rates (2015-2019), higher than the overall mortality rate for PCa in the US (22 *vs.* 18.9) [3]. The mortality rate for Puerto Ricans is also higher than for other ethnic groups in the US, including US Hispanics [4].

PCa is considered a disease of the elderly, affecting primarily men older than 65 years of age, with the median age of diagnosis at 67 years [1, 5]. Although unusual, men can develop early-onset PCa, which has been defined as receiving a PCa diagnosis at \leq 55 years [6]. Although developing PCa under 55 is unusual, it has been well described, representing approximately 7.5% of all new diagnoses in the US from 2015 to 2019 [1]. Most cases of early-onset PCa tend to occur in the upper age range, with approximately 96% of cases occurring above 44 years of age [1]. PCa under 40 years of age is infrequent,

with only 0.2 cases per 100,000 individuals [7]. Hispanic patients diagnosed with PCa under 40 have a lower incidence rate of 0.1 cases per 100,000 individuals [7]. Nonetheless, recent literature documents a rising trend in diagnosing more aggressive PCa cases in ages 15 to 40 worldwide [8].

Currently, there are around 25 published prostate adenocarcinoma cases in patients under 40 years [6, 9-16]. Our article aims to describe a case of prostate adenocarcinoma in a 39-year-old Puerto Rican male. To our knowledge, this is the first reported case of a patient of Hispanic ethnicity with prostate adenocarcinoma under 40 and the 26th reported case worldwide.

Case Report

A 39-year-old Puerto Rican male was referred to a urology clinic by his primary care physician. The patient was found to have an elevated Prostate-Specific Antigen (PSA) for his age. The PSA upon arrival was 2.95 ng/dl. The patient denied a history of fever, groin, pelvic, or genitalia pain, hematuria, frequency, urgency, or dysuria. The patient was in a heterosexual relationship and denied a history of anal intercourse. The patient's past medical history included hypertension, which was treated with lisinopril. The patient had no history of surgeries, hospitalizations, or prior genitourinary evaluation with PSA testing. There is no family history of first-degree relatives diagnosed with PCa.

The physical exam showed a mixed-race Hispanic obese male with a BMI of 30.7. The patients' uncircumcised external genitalia were normal. The digital rectal exam revealed a small, non-tender rubbery prostate gland without nodularity. The patient was sent home, and a follow-up appointment was given in three months with a new PSA test and urine analysis. In three months, the PSA increased to 3.75 ng/dl. The patient was oriented on the findings, and a Transrectal Ultrasound-Guided Prostate (TRUSP) biopsy was recommended.

Laboratory findings

The TRUSP biopsy revealed a 25-cc gland with a PSA density of 0.144. There were no hypoechoic areas, and only a few small periurethral calcifications were present. A standard 12-core transrectal prostate biopsy was performed. The biopsy was positive for Gleason score 3+3 in 3/12 cores, specifically in the left lateral apex (25%), right lateral mid (40%), and right lateral apex (5%).

The patient opted for a radical retropubic prostatectomy. The pathology report upgraded the Gleason score to 3+4 with bilateral involvement. There was evidence of perineural invasion, with tumor extension into the capsule at both apexes. The seminal vesicles were negative for tumor involvement, but the left neurovascular bundle was removed and tested positive for malignancy. The pelvic nodes were negative for metastatic disease. The patient had an ordinary postoperative course with no adverse complications. The patient was recommended for adjuvant radiotherapy but opted for expectant management. The 3-month postoperative PSA tests were unremarkable.

The patient's PSA remained at < 0.064 ng/dL until eight years later when it rose to 0.08 ng/dl. After three months, the PSA further



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increased to 0.11 ng/dL. The patient opted once again for expectant management. The patient's last PSA test one year from the moment of this report was 0.08 ng/dl.

Discussion

PCa is commonly seen in men over 65. It is uncommon in men under 40, with an incidence rate of 0.2 cases per 100,000 [7]. In a thorough literature review including PubMed, Medline, ResearchGate, and other journals, 38 published prostate adenocarcinoma cases in men under 40 were found. Yasuda et al. (2011) reported 13 cases of prostate adenocarcinoma under 40 from 1953 to 2010 in Japan [17]. Unfortunately, the information provided on Yasudas' study of referred cases is insufficient to ascertain the diagnoses, which led us to exclude them from the total count. The total of p ublished case r eports of prostate adenocarcinoma under 40 narrows down to 25 worldwide [6, 9-16].

The Surveillance, Epidemiology, and End Results (SEER) database estimates the incidence of PCa under 40 in Hispanics to be 0.1 cases per 100,000 individuals [7]. The SEER database does not provide information regarding the incidence per Hispanic subgroup, which in our point of interest would be Puerto Ricans, who represent the second largest population of Hispanics in the US [18]. This is worrisome, considering that a recent study found that when Hispanics are further divided into subgroups (including Mexicans, Cubans, Puerto Ricans, South or Central Americans, and Dominicans), Puerto Ricans have the highest prostate cancer-specific mortality when compared to any other ethnic group, including non-Hispanic Blacks [19].

Family history is among the different risk factors evaluated in early onset PCa cases since hereditary PCa is commonly diagnosed at earlier ages (<55 years) [20]. In cases of hereditary or familial PCa, genetic testing for the identification of pathogenic germline variants is often performed. However, regardless of having a family history of PCa, men diagnosed with early onset PCa have been found to carry a greater number of genetic variants associated with increased risk of PCa in Genome-Wide Association (GWA) studies [21]. Lange et al. (2012) found that early onset PCa cases diagnosed at <50 had significantly more risk alleles than those diagnosed at 50 years to 55 years (p = 0.0003) [21]. Additional studies have aimed at elucidating the contribution of germline pathogenic variants on the development of early onset PCa [22-24]. In our case, there was no evidence of a family history of PCa or any other type of cancer in the medical record. Also, there was no evidence of any genetic testing performed on this patient. This could be because the patient did not report any family history of cancer and did not fit the criteria for genetic testing, although he was diagnosed with PCa at an early age. Regarding PSA screening, it is interesting that this patient was ordered this test by his primary care physician at his age since PSA testing is not indicated as a standard of care in men < 40 years. Even in "high-risk" patients, the earliest age for PSA screening is < 55 years, according to the latest American Urological Association (AUA) guidelines. A "highrisk" patient is defined as a patient with a family history of cancer or African American descent [25]. There is no previous evidence in the patient's medical record as to why PSA testing was initially ordered. However, the initial testing, along with the urologist's follow-up, led to the successful detection of the prostate tumor in this patient.

Chinea and co-workers' findings suggest the need for further research to consider an evaluation of the applicability of PCa screening guidelines for each Hispanic subgroup, especially for Puerto Ricans who have higher PCa-specific mortality [19]. The lack of information on the incidence of PCa under 40 in Hispanics limits our ability to identify whether these are isolated cases or indicators of an increasing trend of early-onset PCa diagnoses in this population. This leads us to question if we are diagnosing these patients late in their course of illness and with a higher burden of disease when compared to other ethnic groups.

Conclusion

The case presented in this report represents the first published Hispanic Puerto Rican male with prostate adenocarcinoma under 40. This case report contributes to the limited available information on prostate adenocarcinoma in young males, with the intent to educate and suggest the possibility that PCa is not a disease solely of the elderly. We believe separating the incidence of prostate adenocarcinoma in men younger than 40 per Hispanic subgroup is necessary for a broader understanding of the prevalence of PCa in specific ethnic groups. Additionally, further research with a large cohort of cases is needed to determine if Puerto Ricans have an increased risk for early onset PCa and if guidelines should be revised to include Puerto Rican ethnicity as a risk factor for PSA screening.

Statement of Ethics

This study was performed in accordance with the guidelines for human studies and the World Medical Association Declaration of Helsinki. This study protocol (#2207110023) was reviewed and approved by the Institutional Review Board (IRB) from Ponce Health Sciences University (PHSU) and was given protocol-exempt approval.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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