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ORIGINAL ARTICLE

Clinical and Morphological Characterization of Prostate Carcinoma. "Abel Santamaría Cuadrado" Teaching General Hospital. 2017–2019

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ABSTRACT

Introduction: prostate cancer is a major global health problem due to its high impact in terms of frequency, mortality, and costs.
Aim: to determine the clinical and morphological aspects of patients with prostate carcinoma treated at the Hospital General Teaching "Abel Santamaría Cuadrado" from September 2017 to September 2019.
Methods: a study was carried out descriptive, transversal, in the Hospital General Teaching "Abel Santamaría Cuadrado" in the period from September 2017 to September 2019. From a universe consisting of 336 patients was selected using simple random probability sampling. A sample of 223 patients who met the selection criteria was chosen. Descriptive statistical methods were used to analyze the data, respecting medical ethics.
Results: the 70-79 age group predominated (42,1 %), with no patients under 50 years of age in the sample, and a higher incidence appeared in patients with white skin color. Post-micturition dribbling was the predominant symptom (44,4 %), as well as grade 2 and 3 prostates (48,9 and 45,7 % respectively). Prostate surface antigen values above 15 ng/ml were present in 52,5 % of patients, with Gleason pattern 3 and moderately differentiated carcinomas being the most frequent traits.
Conclusions: the patients were diagnosed at an advanced stage of the disease, when symptoms and signs were more evident.

Keywords: Prostatic Neoplasms; Mortality; Hospitals.

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INTRODUCTION

Prostate cancer (PCa) is a major global health problem due to its high impact in terms of frequency, mortality, and costs. It is the sixth most common type of cancer worldwide and the second most frequently diagnosed in men, being the fifth leading cause of cancer-related death in men, with approximately 1.276.106 new cases and accounting for 3,8 % of all cancer deaths in this sex in 2018. It is estimated that one in seven men will be diagnosed with PCa during their lifetime, and one in 38 men will die as a consequence. The global projection is 1,7 million new cases by 2030, with an expected mortality of 499.000 cases.[1,2,3]

For its clinical diagnosis, it is necessary to determine the size of the prostate, expressed in grades, determined by digital rectal examination and by ultrasound, as follows:[3,4]

- **Grade 1:** the prostate doubles in size, reaching approximately 40 cubic centimeters or weighing about 30 grams. At this size, initial symptoms such as urinary discomfort begin, but in most men they go unnoticed.
- **Grade 2:** the prostate triples in size, reaching about 60 cubic centimeters and weighing about 40 grams. Patients present with symptoms such as difficulty urinating, incomplete bladder emptying, nocturia, weak urinary stream, among others.
- **Grade 3:** the prostate surface reaches a significant size, obscuring the median sulci. This indicates a weight above 60 grams and a volume of 80 cubic centimeters. The previously described symptoms intensify and seriously affect quality of life.
- **Grade 4:** the prostate reaches a very large size, exceeding 80 grams and approximately 100 cubic centimeters in volume.

Prostate-specific antigen (PSA) is a complementary marker that, according to its values, aids in the diagnosis of this disease. In most laboratories, a serum PSA of 4 ng/ml is considered the threshold between normal and abnormal values, although some guidelines indicate values of 2,5 ng/ml or 3,7 ng/ml as abnormal.[5]

From a histological perspective, the classic Gleason system defines five patterns of prostate growth:[3,6,7]

- Pattern 1: characterized by a well-circumscribed nodular lesion composed of well-differentiated, moderately sized, compact, and discrete glands. This pattern is extremely rare, if not nonexistent.
- Pattern 2: may show variations in the size of neoplastic glands, with a slight increase in stroma between glands and mild irregularity at the nodule periphery. This is also considered a very rare pattern.
- Pattern 3: the most common, represented by discrete, distinct neoplastic glands, either grouped or individual, typically small but often variable in size, infiltrating the stroma among benign glands. Originally, this pattern included cribriform structures, some with irregular contours and some within rounded glandular spaces, or gland-within-gland formations.
- Pattern 4: fused glands, no longer individual or distinct, forming cribriform, fused, and irregular patterns. A variant is the hypernephroid pattern with layers of cells with abundant clear cytoplasm.
- Pattern 5: when necrosis occurs within these structures (comedocarcinoma type), also involving solid growth or infiltration by individual tumor cells with no glandular formation.

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Tumors may present a single pattern or multiple ones. In the latter case, a primary grade is assigned to the dominant pattern and a secondary grade to the next most frequent pattern; both numerical values are added to obtain the Gleason score. For tumors with a single pattern, the numerical value is doubled.[7] The Gleason scoring system has evolved over the years, with major modifications in 2005 (International Society of Urological Pathology consensus) and in 2014 (second consensus). The most significant changes were the elimination of Gleason patterns 1 and 2 and the inclusion of all cribriform patterns in Gleason 4. Consequently, the score range is now limited to 6-10.

According to ISUP recommendations combined with the 2016 WHO Blue Book, the prostate cancer grading system is reiterated into five levels (1 to 5), dividing Gleason scores into ≤6, 3+4, 4+3, 8, and >8, respectively. The complexity of this new version can cause confusion among pathologists, urologists, and patients. For example, a Gleason score of 6 is the lowest grade recommended for reporting a biopsy; however, patients may mistakenly assume their tumor has intermediate aggressiveness.

Another consequence of these modifications was the expansion of Gleason pattern 4, which now includes a broader range of histologic architectures. Even in carefully selected images that might suggest a cribriform pattern 3, these are immediately classified as pattern 4, which may lead to more aggressive treatment decisions in lower-risk patients, impacting prognosis classification for Gleason 6 and 7 tumors.[6,8,9]

Incidence and mortality rates vary widely among different populations worldwide, with higher incidence in developed countries compared to developing ones. The geographic variation is likely due to differences in screening availability and diagnostic practices. In Asia and Europe, incidence and mortality are lower, possibly due to dietary habits. International reports from 2018 indicate the highest incidence rates in France (99 per 100,000 men) and New Zealand (90,8 per 100,000); less developed regions such as the Caribbean, Southern Africa, and South America reported rates of 64,2, 64,.1, and 60.4 per 100,000, respectively. Estimated annual deaths account for 6,6 % of all male deaths.[10]

In the United States and Canada, similar data have been reported, with stable incidence at 4,3 % and a mortality decrease of 3,1 %. Nonetheless, in the United States, prostate cancer remains the second leading cause of cancer-related death, with nearly 30,000 deaths. In Latin America, incidence and prevalence vary across countries, but management continues to represent a public health challenge.[11,12,13]

In Cuba, malignant tumors are the second leading cause of death for both sexes at all ages. Among men, prostate cancer ranks second, surpassed only by trachea, bronchus, and lung cancer, and it is also the second in incidence after skin cancer.[14] In 2018, this disease caused 3,140 deaths, with a rate of 56,2 per 100,000 inhabitants.

In Pinar del Río specifically, during 2015–2019, 72 patients died from prostate cancer, with cases reported in all municipalities of the province, according to the Provincial Department of Statistics.[15] This highlights the urgent need for scientific, academic, and ethical measures for a comprehensive approach, aimed at improving diagnosis, treatment, and prognosis through better knowledge of the clinical and morphological features of prostate cancer in our setting. This motivated the present study, with the objective of determining the clinical and morphological characteristics of prostate carcinoma at "Abel Santamaría Cuadrado" Teaching General Hospital from September 2017 to September 2019.

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METHODS

A descriptive, cross-sectional study was conducted with the objective of clinically and morphologically characterizing patients diagnosed with prostate carcinoma at "Abel Santamaría Cuadrado" Teaching General Hospital from September 2017 to September 2019.

The study universe consisted of 336 patients with clinical and morphological diagnosis of prostate cancer. A sample of 223 patients was selected by simple random sampling (lottery method), including patients with a diagnosis of usual acinar prostatic adenocarcinoma by clinical assessment and incisional prostate biopsy, treated at the hospital during the study period.

Data were obtained from biopsy request forms in the Department of Pathological Anatomy. Variables analyzed included age, skin color, symptoms, prostate size, PSA value, Gleason grade, and histological tumor differentiation.

Statistical methods were used to analyze the data, represented by absolute and relative frequencies, and frequency distribution tables using descriptive statistics. Information was stored in a Microsoft® Access Excel 2003 database and processed with SPSS version 15 for Windows XP.

The study was approved by the Institutional Ethics Committee and Scientific Council. Informed consent was obtained from patients. Data were not used for purposes outside of the research. Ethical and bioethical principles and the Helsinki Declaration were respected.

RESULTS

A predominance was observed in the 70–79-year age group (42,1 %), with no patients diagnosed under 50 years of age. Patients of white race predominated across all age groups, except for the 50–59-year group, in which black patients were predominant.

Post-micturition dribbling (44,4 %) was observed as the most frequent symptom, followed by pollakiuria (24,2 %). No asymptomatic patients were reported (Table 1).

Table 1. Distribution of patients according to the presence of symptoms.

Symptoms	No.	%
Post-micturition dribbling	99	4,4
Dysuria	16	7,2
Hematuria	4	1,9
Nocturia	48	21,5
Pollakiuria	54	24,2
Bone pain	1	0,4
General symptoms	1	0,4
Asymptomatic	0	0
Total	223	100

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with prostate grades 2 and 3, representing 48,9 % and 45,7 %, respectively, with grade 1 prostates being less frequent (3,6 %). None of the patients presented a normal prostate (Table 2).

Table 2. Distribution of patients according to prostate size.

Size	No.	%
Grade 1	8	3,6
Grade 2	109	48,9
Grade 3	102	45,7
Grade 4	4	1,8
Normal	0	0
Total	223	100

Evaluation of PSA results showed that highly positive values (>15 ng/ml) predominated (52,5 %), while normal values (<4 ng/ml) were less frequent (0,9 %) (Table 3).

Table 3. Distribution of the sample according to PSA value.

PSA value	No.	%
Normal < 4 ng/ml	2	0,9
Doubtful 4–10 ng/ml	10	4,5
Positive >10–15 ng/ml	94	42,1
Highly positive >15 ng/ml	117	52,5
Total	223	100

Pattern 3 was the most frequent, appearing as both primary (27 %) and secondary or single pattern (24,7 % each). The least frequent pattern was 1, found in only 2,2 % of cases (Table 4).

Table 4. Distribution of patients according to Gleason grades.

Grades	Primary pattern		Secondary pattern		Single pattern	
	No.	%	No.	%	No.	%
	5	2,2	0	0	0	0
1	15	6,7	27	12,1	38	17,0
2	63	28,3	55	24,7	55	24,7
3	22	9,9	26	11,7	4	1,8
4	16	7,2	13	5,8	5	2,2
5	121	54,3	121	54,3	102	45,7
Total	5	2,2	0	0	0	0

A predominance of moderately differentiated tumors was observed, accounting for 70,8 % of cases (Table 5).

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Table 5. Distribution of patients according to histological tumor differentiation.

Histological tumor differentiation	No.	%
Well differentiated	35	15,7
Moderately differentiated	158	70,8
Poorly differentiated	30	13,5
Total	223	100

DISCUSSION

Prostate cancer has been studied worldwide, in Cuba, and in the province of Pinar del Río. Regarding age, the results obtained are similar to those reported by Chamorro et al.,[2] in Huánuco, Peru, where the mean age ranged from 67 to 73 years, and also comparable to those found by Lozano Lorca et al.,[16] in Spain (2022), where the highest incidence was among patients aged 65 to 84 years. This agrees with the reviewed literature, which indicates that the risk increases significantly after the age of 50, with fewer than 0,7 % of cases diagnosed before 50 and 75–85 % occurring in those over 65 years.[12,17]

The U.S. National Cancer Institute reports a mean age of onset of prostate cancer at 72 years,[11] which corresponds to the predominant age group in this study. These results differ from those reported in a 2018 article stating that the mean age at diagnosis in Spain is 69 years, a figure not included in the predominant age group of the present study.[18] They also differ from the findings of Parra Soto et al.,[9] who observed a proportional increase in prostate cancer risk with advancing age, and from Oliveros Pasión et al.,[3] who found higher frequency in the 60–79-year age group.

With regard to skin color, white patients predominated overall. This contrasts with findings by Moraga Rodríguez et al.,[10] who reported higher prostate cancer risk among Black patients, and with Escalona et al.,[4] in Santiago de Cuba, where mixed-race patients were the most affected. These differences may be attributed to regional ethnographic variations—Pinar del Río has a predominance of white inhabitants, while Santiago de Cuba has more mixed-race populations. The predominance of Black patients in the 50–59-year age group aligns with the findings of Oliveros Pasión et al.,[3] who noted that prostate cancer tends to occur at younger ages in Black patients.

The absence of asymptomatic patients is supported by several authors who state that prostate cancer generally develops in the peripheral zone of the gland, producing symptoms only after significant growth, which often indicates locally advanced disease.[18,19] These findings are consistent with Pérez GK et al.,[20] who reported that most men seek medical attention due to the presence of symptoms, underscoring the importance of active screening in primary care. Similar results were reported by Huapaya Cabrera et al.,[21] where post-micturition dribbling was the predominant symptom and no asymptomatic patients were observed.

A U.S. study suggests that prostatic hyperplasia exceeding 65 grams may have a protective effect against prostate cancer, or that no relationship exists between prostate size and cancer development—a view shared by Chamorro L. et al.[2] This may explain why prostates weighing around 40 g (grade 2) predominated in this study rather than higher grades. These findings differ from those of Oliveros Pasión et al.,[3] who observed 6,3 % of patients with a normal prostate on digital rectal examination.

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Escalona and Estrada,[4] at the "Dr. Juan Bruno Zayas Alfonso" General Teaching Hospital in Santiago de Cuba, and Oliveros Pasión et al.,[3] reported similar results, where most patients diagnosed with prostate cancer had PSA values above 10 ng/ml, with only a small percentage within the normal range. This agrees with the reviewed literature, where multiple authors state that elevated PSA levels correlate with increased likelihood of prostate cancer, though cancer can still be present with low PSA values—one of the test's limitations. This explains the 0,9 % of patients with normal PSA in this study. Nevertheless, PSA testing remains, according to most authors, the most important tool for prostate cancer diagnosis and management.[1,20]

Huapaya Cabrera AH,[21] also found Gleason pattern 3 to be the most frequent and pattern 1 the least represented. Similarly, Oliveros Pasión et al.,[3] reported a predominance of tumors with Gleason scores of 5 to 7, i.e., moderately differentiated tumors.

CONCLUSIONS

Two main findings emerge from this study: First, in the province of Pinar del Río, prostate cancer should be suspected in men over 50 years of age. Second, it is crucial to emphasize the importance of active screening in primary care for symptoms and signs, through PSA testing and imaging studies in at-risk populations.

Conflict of Interest
The authors declare no conflict of interest.

Author Contributions
ILF and YRM contributed to conceptualization, research, formal analysis, project administration, writing—original draft, writing—review and editing, data curation, and approved the final manuscript.

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