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Research Article

Epidemiological, Diagnostic, Therapeutic and Evolutionary Aspects of Prostate Cancer with PSA Greater Than 100ng/ml

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Abstract

Objective: To study the epidemiological, diagnostic, therapeutic and progressive aspects of prostate cancer with PSA ≥ 100 ng/ml at Owendo University Hospital. Methodology: Prospective, descriptive study with progressive inclusion of cases, conducted from November 2021 to October 2024. It involved 40 patients admitted to the general surgery department of Owendo University Hospital. The variables studied were age, medical history, comorbidities, reason for consultation, duration of symptoms, PSA kinetics, nadir time, castration resistance time, Gleason score and duration of treatment. Results: The prevalence was 35.5% of CaP cases. The average age was 66.9 ± 6.1 years. All patients had lower urinary tract symptoms and 95% of cases had a pathological prostate on digital rectal examination. Stages T2 and T3 accounted for 32.5% and 55% of cases. Forty-seven per cent of cancers were low grade. CT-TAP revealed 47.5% of metastatic cancers with 45.0% of bone metastases. Treatment consisted of first-generation hormone therapy, chemotherapy, and radical prostatectomy in 95%, 20%, and 5% of cases, respectively. Symptoms regressed in 60% of cases, and the nadir time was 10.9 months. During the 24-month follow-up period, 11 patients achieved a PSA level below 4 ng/ml and 6 cases showed resistance to castration after an average of 15 months of treatment. The mortality rate was 20%. Conclusion: Prostate cancer with PSA levels above 100 ng/ml is common in our country. A PSA level ≥100 ng/ml does not necessarily indicate high-grade prostate cancer, let alone metastasis. Treatment with hormone therapy and even definitive local treatment allows for effective control of the disease.

Keywords

Prostate Cancer, High PSA, Hormone Therapy, Mortality

1. Introduction

Prostate cancer is the second most common cancer in men after lung cancer [1]. It remains a major public health issue due to its high prevalence and the cost associated with its treatment. A high PSA level is predictive of poor prognosis in pros-

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tate cancer. While average PSA levels are low in England, Malaysia and France, at 72.2 ng/ml, 13.54 ng/ml and 11 ng/ml respectively [2], an average PSA level of 428.64 ng/ml has been reported in Marocco [3]. In Gabon, cases reported during Blue November 2020 showed an average PSA level of 454.2 ng/ml [4]. The aim of this prospective study was therefore to describe PCa with a PSA level greater than or equal to 100 ng/ml and to add to the epidemiological data available in the literature on this subject.

2. Patients and Method

This study was conducted in the general surgery department of the Owendo University Hospital Centre (CHUO). It was a prospective, single-centre, descriptive study with progressive patient recruitment. It focused on the epidemiological, diagnostic, therapeutic and evolutionary aspects of prostate cancer with PSA levels above 100 ng/ml from November 2021 to October 2024, i.e. a period of 36 months. Patients who did not comply with follow-up and those who were lost to follow-up (excluding deaths) or who were found to have another cancerous pathology during the study period were excluded. The variables studied were epidemiological (age, occupation, insurance, marital status); related to diagnosis (comorbidities, reason for consultation, duration of symptoms, rectal examination, urinary stream strength, signs of spread; initial total PSA and its evolution, prostate MRI, histological type, proportion of biopsy sample affected, Gleason score, testosterone, urea, creatinine, haemoglobin levels).; related to treatment (medical treatment, surgical treatment, chemotherapy); related to progression (PSA kinetics, nadir times, castration resistance times, prostate volume progression, testosterone level progression, symptom progression, occurrence of death, lifespan under treatment). The variables were analysed using the calculation functions in Excel 2024 and XLSTAT 2024 software. Categorical variables were summarised by modal counts and frequencies. Quantitative variables were described by means with standard deviation, medians, minimums and maximums.

3. Result

During our study, we found 257 cases of CaP, with 35.5% of CaP cases having a PSA level greater than or equal to 100ng/ml.

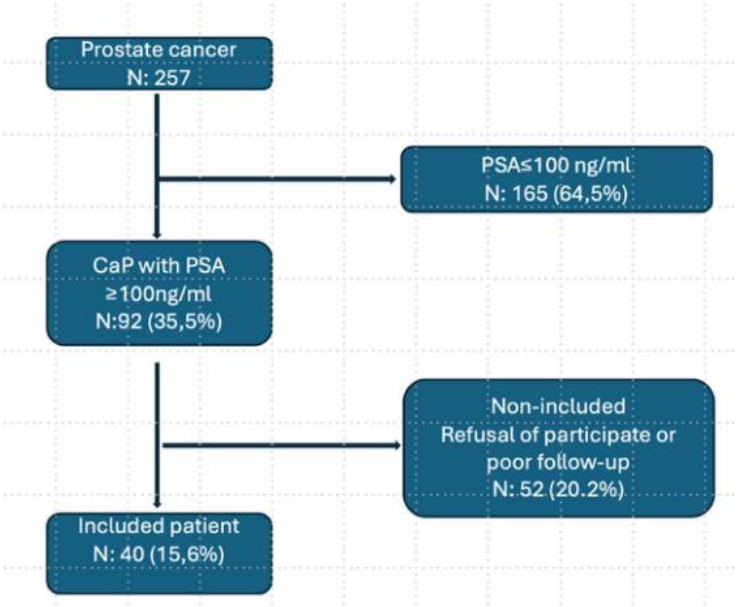

Figure 1. *Flow chart of prostate cancer cases with PSA levels above 100 ng/mL from 2019 to 2024.*

The average age was 66.9 ± 6.1 years, with a median of 68 years and extremes ranging from 56 to 81 years. The age group ranging from 60.0 to 69.0 years had a frequency of 45%.

The most common reason for consultation was dysuria, accounting for 32.5% of cases. The average duration of symptoms was 4.2±3 months, ranging from two (2) weeks to ten (10) months. All patients had obstructive and/or irritative urinary symptoms. The proportions of patients presenting only obstructive or irritative signs were 52.5% and 17.5%, respectively. The rest of the cohort had both syndromes. Digital rectal examination of the prostate was abnormal in 95% of patients. The initial PSA level had a mean of 1035±1330.71 ng/mL with a median of 314 ng/mL and extremes ranging from 100 ng/mL to 4960 ng/mL.

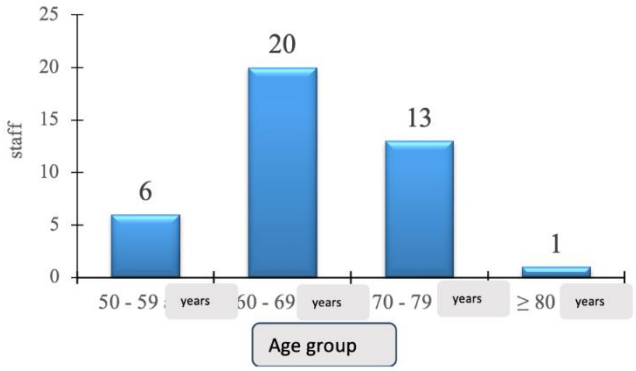

Figure 2. Distribution of patients by age group.

Table 1. Breakdown by reason for consultation.

Reason for consultation	Staff	Purcentage
Dysuria	13	32,5
Pollakiuria	7	17,5
Urunary retention	7	17,5
Low back pain	6	15
Paraplegia	3	7,5
deterioration in overall health	2	5
Hematuria	2	5
Total	40	100

Table 2. Distribution according to initial PSA level.

initial PSA level.	Staff	Purcentage
100 à 500	24	60
501 à 1000	3	7,5
1001 à 1500	3	7,5
1501 à 2000	5	12,5
>2000	5	12,5
Total	40	100

Adenocarcinoma was the only histological type found. The histological results of prostate biopsies revealed a frequency of 30% for Gleason 8. Prostate cancers were high grade (Gleason ≥ 8) in 42.5% of cases. At the end of the staging process, 47.5% of the cohort, or 19 patients, had metastatic prostate cancer (Figure 3).

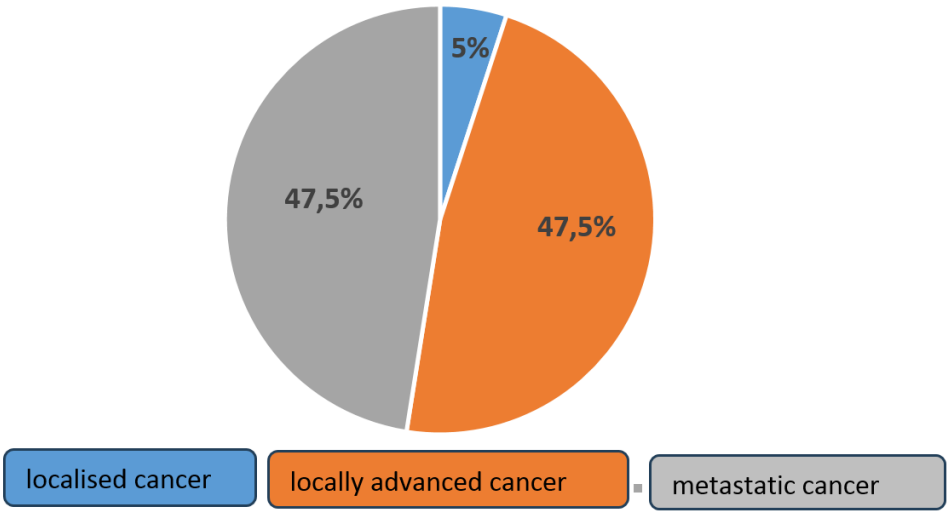

Figure 3. Distribution according to tumour spread.

Thirty-eight patients (95%) had undergone chemical castration (combination of 50 mg bicalutamide and 30 mg leuprorelin LP in 60% of patients). The mean time to nadir was 10.9 ±7.15 months, with extremes of 2 months and 24 months. The mean time to castration resistance was 15 months, with extremes of 12 months and 21 months. All patients with localized cancer showed regression of signs after treatment. In patients with locally advanced cancer, regression of signs was achieved in 73.7% of cases. In the metastatic cancer population, regression of signs was achieved in 9 patients (47.4%). We recorded 8 deaths, representing a rate of 20%, with a median survival time of 16.4 months, ranging from 3 months to 25 months. Among the patients who died, 5 had metastatic cancer and 3 had locally advanced cancer.

4. Discussion

This study found a prevalence of PCa with PSA ≥ 100 ng/mL of 35.5%. Darre et al. in Togo and Mougougou et al. in Senegal found a higher prevalence than in this study, with 72.5% and 41.7% of cases, respectively [5, 6]. This higher prevalence reflects the biological aggressiveness of CaP in young subjects [7]. Ndoye et al. in Senegal also reported a high prevalence of 72% [8]. This difference can be explained by the fact that half of the cases followed by Ndoye et al. did not undergo biopsy. The present study found a higher prevalence than that found in studies by Jang et al. in Korea, Huang et al. in Taiwan, and Izumi et al. in Japan, which reported 18.3%, 16.7%, and 14%, respectively [9, 10]. The high prevalence of advanced cancers found in Africa can be explained by the fact that black subjects present earlier, more aggressively and consult late [6, 8, 11]. The average age in this study was 66.9 ± 6.1 years, with a median of 68 years and extremes ranging from 56 to 81 years. This average age is corroborated by other authors in the literature, such as Mbethe et al. in Gabon, Tean et al. in Guyana, and Ntama et al. in Cameroon, who found ages of 64, 65, and 68, respectively [2, 4, 12]. These results are justified by the fact that PCa is a condition frequently found after the age of 55, with a clear predominance between the sixth and seventh decades of life. According to these results, the average age of patients with high PSA PCa does not differ from that of patients with lower PSA PCa. Asian studies focusing specifically on cases of high PSA CaP reported a higher median age than that reported in the present study. Indeed, Huang et al. in Taiwan and Ang et al. in Australia reported median ages of 73 and 77 years, respectively [13, 14]. This confirms the fact that black subjects present earlier and more aggressively [11].

High blood pressure (HBP) and diabetes were the most common comorbidities, accounting for 30% and 10% of cases, respectively. These results can be explained by the frequency of cardiovascular disease in the Gabonese population [15]. Mougougou et al. found a 41.7% prevalence of comorbidities. The frequency of comorbidities found in this study is higher than that reported by Ndoye et al. in Senegal, where it was 24.4%. In all previous studies, the proportions of cardiovascular diseases (HBP, diabetes) in cases of PCa are similar to those in the general population. These results can be explained by the fact that HBP, type 2 diabetes, and prostate cancer share the same risk factors, namely advanced age, male gender, and smoking.

The most common reasons for consultation were dysuria, pollakiuria, and acute urinary retention, accounting for 32.5%, 17.5%, and 17.5% of cases, respectively. In addition, 15% of patients consulted for bone pain, particularly low back pain. These results are consistent with those described by Mbethe et al. in Gabon, who reported that dysuria accounted for 55.6% of cases, respectively, and pollakiuria for 33.6% of cases [4]. All patients in our cohort presented with lower urinary tract symptoms. Obstructive urinary symptoms were reported to be predominant in 52.5% of cases. Irritative symptoms were found in 17.5% of cases. Our results are comparable to those of Huang et al., who reported that all patients presented with lower urinary tract symptoms at the time of diagnosis [13].

Several studies conducted on the black population of Africa reveal a higher total PSA level at diagnosis than that found in other parts of the world [4]. Our study found an average total PSA level of 1035±1330.71 ng/mL, with extremes of 100 ng/mL and 4960 ng/ml. The Senegalese study conducted by Mougougou et al. on prostate cancer in young subjects reported an average PSA level of 557.3 ng/mL [6]. However, when patients with PSA <100 ng/mL were excluded from their cohort, results comparable to ours were found (PSA of 1306.6 ng/mL with a minimum of 100 ng/mL and a maximum of 5000 ng/ml). These results suggest that young age does not influence the initial PSA value. The cases of PCa monitored by Mbethe et al. in Gabon and those compiled by Ntama et al. in Cameroon reported a lower average PSA than ours, with 454.2 ng/mL and 462.16 ng/ml, respectively [2, 4]. These results can be explained by the fact that our study specifically focused on PCa with high PSA levels.

In our study, all patients underwent CT-TAP and prostate MRI, and no patients underwent bone scintigraphy. This staging assessment identified 5% of localized prostate cancer and equal proportions of locally advanced and metastatic prostate cancer, i.e., 47.5%. Mbethe et al. during Blue November 2020 in Gabon reported that prostate MRI was performed in 85% of patients and that all had undergone CT-PSA [4]. This is due to the fact that during this campaign, certain tests are provided free of charge. Ndoye et al. in Senegal reported that CT-PSC was performed in 21.6% of patients, bone scintigraphy in 4.9%, and MRI in 2.5% [8]. This is due to poor healthcare facilities but also to the economic difficulties of patients. In Taiwan, Huang et al. reported that the 418 patients in their cohort had undergone abdominal and pelvic MRI and bone scintigraphy [13]. These tests identified 67 (19.5%) patients with non-metastatic PCa and 276 (80.5%) patients with metastatic disease. MRI allows for better diagnosis of metastases than conventional imaging, which may explain the higher proportion of metastatic PCa in this study [16].

This study revealed that androgen deprivation therapy was administered as first-line treatment in 95% of patients. Following the extension assessment and depending on the progression of the disease, treatment continued with the combination of other molecules. Second-generation chemotherapy and hormone therapy were administered in 20% and 17.5% of cases, respectively. None of our patients underwent radiotherapy or surgical castration. In Gabon, Mbethe et al. reported results similar to ours [4]. Chemical and surgical castration was performed in 81.5% of cases, and combination chemotherapy and hormone therapy was used in 3.7% of cases.

The median time to nadir was 10.91±7.15 months, with extremes ranging from 2 months to 24 months. Our results are consistent with those of Huang et al., who reported a median time to nadir with a PSA below 1 ng/mL of 8 months [13]. This time was obtained in patients who had received definitive

local treatments combined with androgen deprivation. Among this cohort, metastatic PCas had a mean nadir time of 9.1 months, with extremes ranging from 2 months and 24 months. In this subgroup, the mean nadir value was 115.8 ng/mL, with extremes ranging from 0.07 ng/mL to 701 ng/ml. The Korean study conducted by Koo et al. on the survival of patients with PCa with bone metastases and high PSA reported a nadir time shorter than in the present study, i.e., 6 months with a PSA nadir of 11.6 ng/mL [17]. The Korean patients all had one or more bone metastases, indicating advanced disease. Furthermore, a shorter nadir time is associated with decreased survival with an increased risk of progression and a greater risk of bone lesions [16, 17]. The mean time to castration resistance was 15 months, with extremes of 12 months and 21 months. Castration resistance was observed in 15% of patients.

These results are corroborated by Tengue et al in Togo, who found castration resistance in 14.8% of patients undergoing hormone therapy with an average delay of 16.2 months and extremes ranging from 6 months to 28 months [18].

At the end of 24 months of follow-up, no patients with localized cancer were resistant to castration. These results are consistent with those of Huang et al., who found 9% resistance to castration in patients with localized disease [13]. The slight difference can be explained by the smaller sample size in the present cohort and the shorter follow-up period. This study reports a benefit of prostatectomy in the treatment of high-risk localized PCa. Koo et al. report more serious results than those of the present study. In fact, the number of patients in therapeutic escape was 80 cases (66.6%) [17].

We recorded 8 deaths, representing a rate of 20% within an average period of 16.4 months. ranging from 3 months to 25 months. Tengue et al. reported a lower mortality rate of 15.1% [14]. Our study included only cases of high PSA PCa, which explains the mortality rate.

5. Conclusion

Prostate cancer with PSA levels greater than or equal to 100 ng/mL is quite common in sub-Saharan Africa, particularly in Gabon. The lack of a nationwide screening policy, underestimation of early symptoms, and long waiting times for consultation are responsible for late diagnosis. Contrary to popular belief, prostate cancer with high PSA levels is not always high grade. It can be discovered at any stage, whether localized or metastatic. Although first- and second-generation hormone therapy is recommended, definitive local treatment can be administered at the localized stage. Patients with this disease have a good prognosis with a relatively low mortality rate in our country. The prognosis in our practical context is acceptable given the available therapies. However, to reduce mortality, it is necessary to implement early screening policies.

Abbreviations

CT-TAP	Chest, Abdomen and Pelvis CT Scan
PSA	Protate Specific Antigen
MRI	Magnetic Resonance Imaging
CaP	Cancer Prostate
HBP	High Blood Pressure

Author Contributions

Mougougou Adrien: Conceptualization, Resources
Mbethe Dimitri: Data curation, Methodology

Conflicts of Interest

The authors declare no conflicts of interest.

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