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Research Article

Metastatic Prostate Cancers at the University Hospital Center-Bogodogo (CHU-B) in OUAGADOUGOU : Situation in a Resource-Limited Country like Burkina Faso

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Abstract

Prostate cancer is the leading cancer in men in Burkina Faso, contributing to an incidence rate of 26.3%, according to GLOBOCAN 2020. Metastatic prostate cancer (mPC) makes up about 30% of prostate cancer cases. Our objective was to examine the epidemiological, diagnostic, and treatment characteristics of mPC hospitalized and non-hospitalized instances within the Clinical Oncology and Hematology Department of the University Hospital Center-Bogodogo (CHU-B). This study adopted a descriptive cross-sectional approach, encompassing retrospective data acquisition from May 1, 2017, to April 30, 2020. All patients undergoing follow-up for mPC, with confirmed histological diagnosis and metastatic verification supported by clinical, radiological, and/or histological evidence, were included. Data was collected from individual records within patients' clinical files. mPC comprised 76.6% of the diagnosed prostate cancer cases. The average age was 67.7 years [range: 50 to 89 years]. The typical interval before consultation was 29.7 months. Urinary symptoms were present in 87.7% of cases, while bone pain was reported in 75.5% of cases. Secondary bone involvement was identified in 78.26% of instances. The mean total PSA level was 1179.28 ng/ml, [range: 7 to 9976 ng/ml]. The complete androgen blockade protocol was utilized for treatment in 69.3% of patients, with the Docetaxel protocol being employed in 26.5% of cases. The median survival duration was 8.13 months. mPC was predominant among prostate cancers, underscoring the urgency of promptly implementing Burkina Faso's strategic plan for cancer control.

Keywords: Metastatic Prostate Cancer; CHU Bogodogo; Burkina Faso; Early Screening and Detection; Treatment Characteristics.

Introduction

Prostate cancer is a public health issue worldwide and ranks as the second leading cause of mortality in men after lung cancer [1]. The limited availability of individual prostate cancer screening programs in resource-limited countries like Burkina Faso places it at the forefront of cancers affecting men [2]. The predominance of early stages found in the Western world is often attributed to better organization of individual screening, combined with blood testing for prostate-specific antigen (PSA) levels along with digital rectal examination [3]. This approach to prostate cancer control, which is less common, results in a notable prevalence of advanced or even metastatic stages of prostate cancer in African countries such as Burkina Faso [4-6]. For instance, a study in Senegal reported nearly 45.9% of cases being metastatic prostate cancer (mPC) [7]. Known risk factors such as Black race, combined with socioeconomic conditions, sociocultural influences, access to individual screening, early diagnosis, and treatment, all contribute to the dominance of mPC in our context. The objective of our work was to study the epidemiological, diagnostic, and therapeutic profiles of mPC in the Clinical Oncology Hematology Department of the University Hospital Center Bogodogo (CHU-B) in Ouagadougou, Burkina Faso, aiming to enhance patient care.

Patients and Methods

This study followed a descriptive cross-sectional approach and involved retrospective data collection spanning from May 1, 2017, to April 30, 2020, in the Clinical Oncology Hematology Department of CHU-B. All patients under follow-up for prostate cancer hospitalized and the non-hospitalized with a confirmed histological diagnosis including metastatic confirmation based on clinical, radiological, and/or histological evidence during the study period were included.

Data collection was conducted using individual forms extracted from patients' clinical oncology consultation and hospitalization records, as well as patient clinical oncology consultation registers, chemotherapy registers, and hospitalization registers. The study variables included socio-demographic data (age, urban or rural residence, occupation), diagnostic information (reason for consultation, medical history, consultation delay, clinical manifestations, paraclinical examinations, TNM classification, anatomopathological aspects: histological type, Gleason score), and therapeutic data (hormone therapy, chemotherapy, palliative care).

Data analysis was carried out using a microcomputer equipped with EPI Info 7.2.2.6 software. Survival analysis was conducted using the Kaplan-Meier model.

Results

Distribution of Patients

From May 1, 2017, to April 30, 2020, we identified 894 patients with cancer in the Clinical Oncology Hematology Department of CHU-B, among which 64 cases were prostate cancer (7.1%). Metastatic prostate cancers accounted for 49 cases (76.6%). The average age of patients was 67.7 years, ranging from 50 to 89 years. The age group of [50 years - 70 years] represented 55.1% of patients. The distribution of patients according to age groups is depicted in Figure 1.

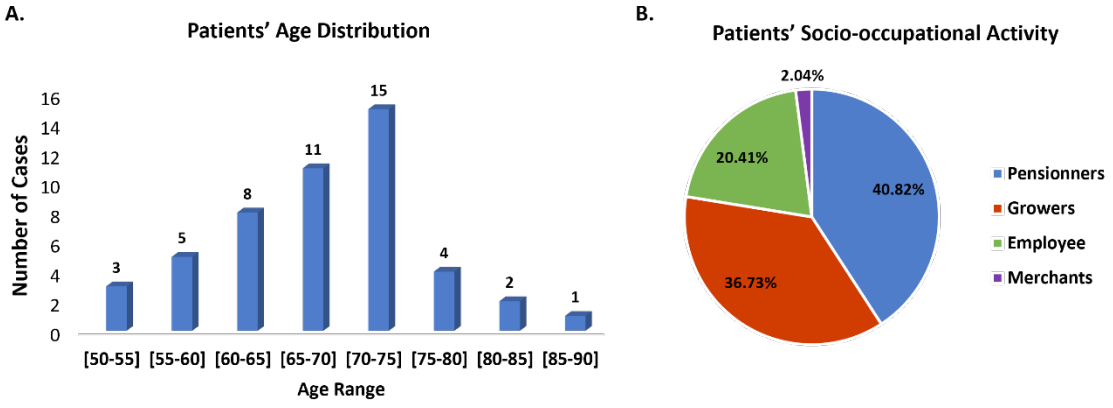

Figure 1: The distribution of patients according to age groups is depicted.

Patients predominantly came from urban areas in 75.5% of cases and rural areas in 24.5% of cases. Among the patients, 36.7% were farmers. Figure 2 illustrates the distribution of patients based on their socio-occupational activities. The average consultation delay was 29.7 months, with a range of 2 months to 6 years. Figure 3 illustrates the distribution of patients according to the consultation delay. Consultation reasons were primarily dominated by bone pain in 75.5% of cases. The distribution of patients based on consultation reasons is shown in Table 1.

Reason for Consultation	Effect (n)	Frequency (%)
Bone pain	37	75.5
Obstructive tubes	25	51
Irritative urinary symptoms	18	36.7
Acute urinary retention	16	32.7
Hematuria	12	24.5
Chest pain	5	10.2
Abdominal pain	5	10.2

Table 1: Distribution of patients according to consultation reasons.

The general condition of patients was specified for 47 patients (97% of cases). Thirty-four patients (69.4%) had a general condition classified as Grade 2 according to the WHO ECOG-PS score. The distribution of patients according to the ECOG score is depicted in Figure 4. The PSA level was measured in 46 patients. The average PSA level was 1179.28 ng/ml, ranging from 7 ng/ml to 9976 ng/ml. Patients with a PSA level equal to or higher than 100 ng/ml constituted 89.1% of cases. The distribution of patients according to PSA levels is summarized.

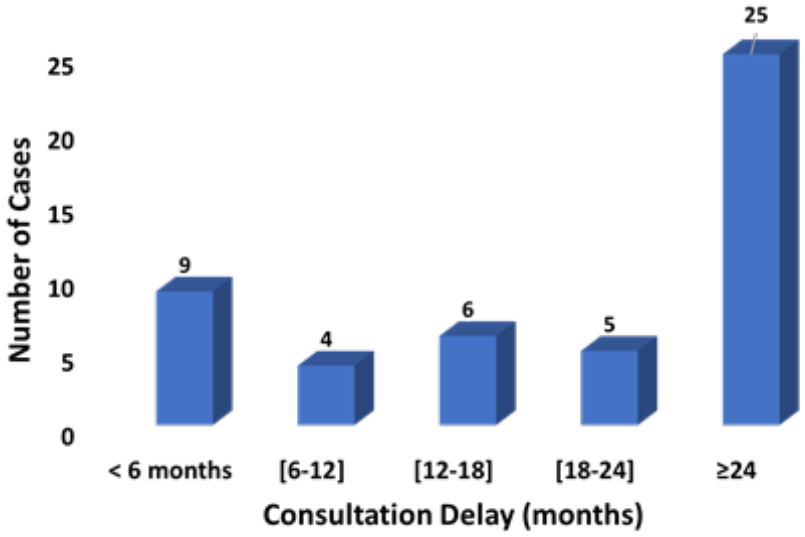

Figure 2: The distribution of patients based on their socio-occupational activities.

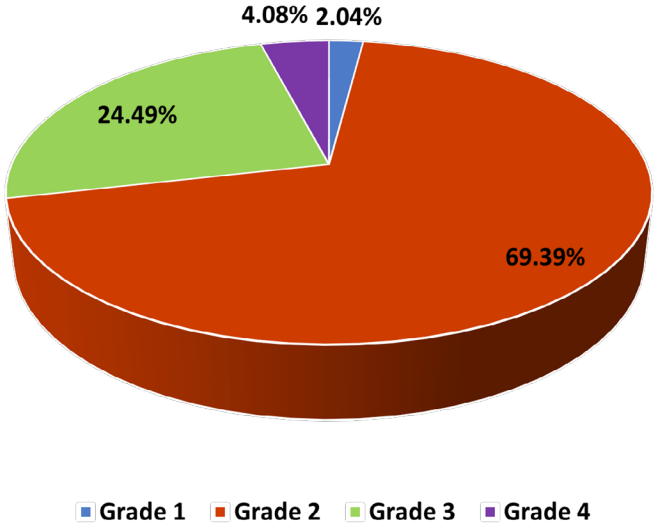

Figure 3: The distribution of patients according to the consultation delay.

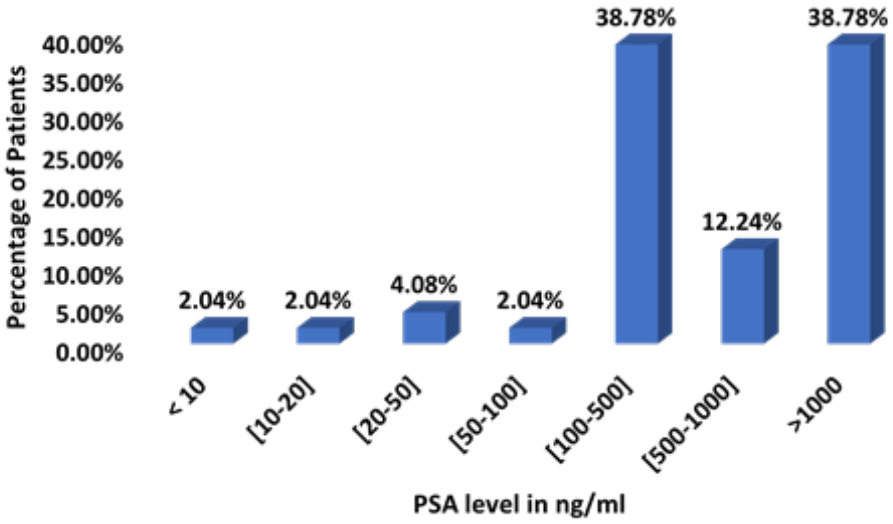

Figure 4: The distribution of patients according to the ECOG score is depicted.

Patient Clinical Records

Patients who were able to undergo thoracic-abdominopelvic (TAP) scans represented 93.9% of patients. The distribution of patients based on conducted radiological exams and bone scans is shown in Table 2. Within the TAP scans, findings indicated 30 instances of bone metastases (65.2%) and 16 instances of extra-osseous metastases (34.8%). The TAP scans identified various extra-osseous sites, with pulmonary involvement (37.5%) being the most prevalent, as detailed in Table 3. Among the bone scans, the dorsal spine was the most common location for bone metastases (33.3%). The specific bone locations identified through bone scans are presented in Table 4.

Patients' Examinations	Effect (n)	Frequency (%)
Radiological examinations and Bone Scans		
CT scan of the thoracic-abdominal pelvic area	46	93.9
Bone scan	15	30.6
Abdominopelvic ultrasound	14	28.6
Abdominopelvic MRI	8	16.3
Spine CT scan	6	12.2
Transrectal ultrasound	5	10.2
Spinal MRI	5	10.2
Chest X-ray	5	10.2
Extra-osseous locations		
Lung	6	37.5
Liver	4	25
Kidney	3	18.8
Iliac lymph nodes	2	12.5
Pleural	1	6.2
Bone locations		
Dorsal spine	5	33.3
Diffuse	4	26.7
Lumbar spine	2	13.3
Upper limb	1	6.7
Pelvis	2	13.3
Ribs	1	6.7

Table 2: Distribution of patients according to radiological examinations and bone scan, extra-osseous locations detected through scans, and bone locations on bone metastases.

All patients displayed adenocarcinoma, and a Gleason score of 7 (4+3) was observed in 26 patients (53.1%). The distribution of patients based on their Gleason scores is outlined in Table 4. As per the TNM classification, T4N1M1c was identified in 44.89% of cases. Table 3 provides an overview of the patient distribution by TNM stage. Complete androgen blockade using Triptorelin + Bicalutamide was administered to 61.2% of patients. The breakdown by type of hormone therapy is depicted in Table 7. Among those who underwent second-line treatment after hormonal resistance, 17 patients were treated: 4 patients (8.1%) received Abiraterone acetate, and 13 patients (26.5%) received Docetaxel-based chemotherapy. The most prevalent side effects of hormone therapy were erectile dysfunction coupled with reduced libido, affecting 42 patients (82.5%), as detailed in Table. Palliative treatment primarily revolved around the utilization of first-tier analgesics. The median survival stood at 8.13 months, accompanied by a 95% confidence interval spanning from 6.03 to 15.17 months, encompassing a total of 41 patients. The visual representation of survival via the Kaplan-Meier curve is portrayed.

Clinical Characteristics	Effect (n)	Percentage (%)
PSA levels (ng/ml)		
< 10	1	2.04
10-20	1	2.04
20-50	2	4.08
50-100	1	2.04
100-500	19	38.78
500-1000	6	12.24
>1000	19	38.78
Gleason Score		
7 (4+3)	26	53.1
8 (4+4)	14	28.6
6 (3+3)	3	6.1
7 (3+4)	3	6.1
9 (5+4)	2	4.1
4 (3+1)	1	2
Stage TNM		
T4N1M1c	22	44.89
T2N0M1b	12	24.48
T4N1M1b	6	12.24
T4N0M1b	4	816
T2N0M1c	2	4.08
T1N0M1b	1	2.05
T3N0M1b	1	2.05
T4N0M1c	1	2.05
Cancer Treatment Protocol		
Triptorelin + Bicalutamide	30	61.2
Goserelin + Bicalutamide	4	8.2
Pulpectomy	14	28.6
TURP / Goserelin	1	2
Hormone Therapy Side Effects		
Erectile dysfunction / Decreased libido	42	85.7
Fatigue / Hot flashes	18	36.7
Gynecomastia	4	8.1
Hypertension (High Blood Pressure)	4	8.1
Muscle aches	3	6.1

Table 3: Distribution of patients according to the PSA levels, Gleason score, TNM classification, hormone therapy treatment protocol, and side effects of hormone therapy.

Palliative care	Effect (n)	Frequency (%)
Mild analgesics (Step I)	37	90.2
Moderate analgesics (Step II)	28	68.3
Blood transfusion	23	56.1
Corticosteroid therapy	17	41.5
Zoledronic acid	11	26.8
Antibiotic therapy	9	22.0
Strong analgesics (Step III)	6	14.6
Palliative surgery	6	14.6
Antiemetics	2	4.9
Three-way bladder irrigation	1	2.4

Table 4: Distribution of patients according to the nature of palliative care.

Discussion

In our research, prostate cancers accounted for 7.1% of all cancers notified during our study period. The relatively low incidence of prostate cancer may be attributed to the tendency of patients to initially seek urological consultations in other medical facilities. Subsequently, they come for medical oncology consultations or are admitted to the clinical hematology-oncology department primarily in response to complications. Alternatively, referrals occur when urologists detect hormonal escape or the manifestation of metastases. The incidence of metastatic prostate cancer (mPC) constituted nearly 76.6% of the hospitalized cases and no hospitalized cases with prostate cancer. This outcome surpassed the figures observed in Senegal, where it was 45.9% [7], and 30% in Guinea [8]. This variation could be elucidated by the distinction that our study took place within an oncology department, where medical oncology activities held a dominant role, in contrast to the urology-focused investigations conducted in those aforementioned countries.

The average age of the patients was 67.7 years, ranging from 50 to 89 years, which is comparable to findings in Europe [9] and the United States of America [10]. However, the prevalence of the age group [50 to 70 years], representing 55.1% of the patients in our study, could be linked to confirmed risk factors associated with the Black race [10,11]. The predominance of farmers at 36.7%, likely related to a lower economic status, could also explain the frequency of mPC in our series and that of the Ivory Coast [11]. The extended average delays in seeking medical consultation, as in our case with an average of 29.7 months, ranging from 2 months to 6 years, could provide a rationale for the higher occurrence of mPC in African case series [6,8]. Consequently, the necessity for early-stage detection through effective individualized screening strategies becomes indisputable [3].

The primary reasons for seeking medical consultation were predominantly bone pain, observed in 75.5% of cases, justified by the favored secondary bone sites for mPC, present in nearly 80%, in alignment with literature findings [12]. Consequently, the overall health status of patients was characterized by Grade 2 scores on the WHO ECOG-PS scale, paralleling the outcomes of the study conducted in Guinea [8]. The average prostate-specific antigen (PSA) level stood at 1179.28 ng/ml, ranging from 7 ng/ml to 9976 ng/ml. Patients with PSA levels equal to or greater than 100 ng/ml constituted 89.1% of cases. This PSA threshold, equal to or surpassing 100 ng/ml, surpassed the corresponding figures in Ivory Coast, Guinea, and Niger, which were 71%, 71.67%, and 77.03%, respectively [5,8,11]. These notably elevated PSA levels could be attributed to the heightened aggressiveness of mPC in Black individuals, exacerbated by delayed medical consultations, not discounting the initial peripheral zone-based carcinogenesis of prostate cancer, which often remains asymptomatic in its early stages.

Paraclinical assessments, including thoracic-abdominopelvic CT scans and bone scintigraphy, highlighted a prevalence of bone metastases (65.2% on CT scans). This underscores the osteophilic nature of prostate cancer, as recognized by various authors [13-15]. The spine emerged as the primary site for bone metastases, aligning with findings from studies in Guinea (75%) and Ivory Coast (42%) [6,8].

Adenocarcinoma constituted the histological type in all patients, consistent with literature indicating its prominence in prostate cancers [16-18]. According to the TNM classification, T4N1M1c was noted in 44.89%, potentially influenced by the Black race—a recognized prostate cancer risk factor [19-21]. Late consultations, driven by socio-cultural and economic factors in our context and other African countries [8,18,22,23], compounded by the absence of an effective individual screening strategy in Burkina Faso, contributed to this trend due to the non-implementation of the cancer control strategic plan.

As a primary treatment, 61.2% of patients underwent complete androgen blockade with Triptorelin + Bicalutamide. Following the hormonal escape, the second line of treatment involved Abiraterone Acetate in 8.1% and Docetaxel chemotherapy in 26.5% of 17 patients. The unavailability of key molecules like Enzalutamide and Apalutamide, crucial in hormone therapy for metastatic prostate cancers, might have impacted patient prognosis positively [24-26].

Noteworthy side effects of hormone therapy comprised erectile dysfunction and reduced libido in 82.5% of patients, posing a significant challenge to treatment adherence alongside recurring financial issues. This underscores the urgent necessity for implementing universal health insurance in Burkina Faso. The absence of a robust individual screening strategy, delayed consultations, and challenging access to anticancer drugs contributed to a median survival of 8.13 months, with a 95% confidence interval and extremes ranging from 6.03 to 15.17 months.

Clinical Practice Points

- **Early Detection and Screening:** Emphasize the importance of early detection through regular screening programs, especially in high-risk populations, given the high prevalence of metastatic prostate cancer.
- **Diagnostic Focus:** Highlight the significance of prompt diagnosis through a combination of clinical, radiological, and histological evidence for confirming metastatic prostate cancer.
- **Symptom Recognition**: Educate healthcare providers on recognizing common symptoms such as urinary symptoms and bone pain, which were prevalent in a significant percentage of cases.
- **PSA Monitoring:** Emphasize the role of monitoring prostate-specific antigen (PSA) levels for early detection and monitoring of treatment response.
- **Treatment Strategies:** Consider the utilization of complete androgen blockade as a primary treatment protocol for metastatic prostate cancer, as it was used in a majority of cases in the studied population. Acknowledge the use of the Docetaxel protocol as an alternative treatment strategy. Promote access to new palliative treatment strategies, particularly for bone metastases, and to new molecules for hormone therapy in prostate cancer.
- **Survival Expectations:** Inform healthcare providers about the median survival duration of 8.13 months, providing realistic expectations for prognosis and guiding discussions with patients.
- **Strategic Cancer Control Implementation:** Advocate for the timely implementation of Burkina Faso's strategic plan for cancer control to address the high prevalence of metastatic prostate cancer.
- **Public Health Initiatives:** Encourage public health initiatives to raise awareness about prostate cancer, its symptoms, and the importance of seeking medical attention promptly.
- **Multidisciplinary Approach:** Promote a multidisciplinary approach to the management of metastatic prostate cancer, involving oncologists, urologists, radiologists, and other relevant specialists.
- **Continued Research:** Encourage further multicentric research to explore additional factors influencing the prevalence and outcomes of metastatic prostate cancer in Burkina Faso.

These clinical practice points provide actionable insights for healthcare professionals and policymakers to improve the management and outcomes of metastatic prostate cancer in Burkina Faso.

Conclusion

Metastatic prostate cancers significantly affect CHU BOGODO's clinical oncology-hematology department, where chemotherapy and hormone therapy are administered. The prevalence of multimetastatic stages is largely attributed to delayed consultations, restricted access to anticancer drugs, and the lack of an effective individual screening strategy for prostate cancer. The unavailability of critical therapeutic molecules underscores the urgent need for universal health insurance and improved implementation of the cancer control strategic plan.

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Valerie Odero-Marah; Supervision: Bambara H Aboubacar, Valerie Odero-Marah, Kabore Fasnewinde Aristide; Validation: Bambara H Aboubacar, Valerie Odero-Marah, Kabore Fasnewinde Aristide, Zerbo Nina Assanatou; Visualization: Bambara H Aboubacar and Valerie Odero-Marah; Writing-original draft: Bambara H Aboubacar; Writing-review & editing: Valerie Odero-Marah

Conflict of Interest

The authors declare no conflict of interest.

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