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SAJ Cancer Science

RESEARCH ARTICLE

ISSN: 2375-6683

Therapeutic Outcomes and Prognostic Factors of Bladder Cancer: A Retrospective Cohort Study in Abidjan, Côte d'Ivoire

Kouassi KKY [1,2,*], Odo BA[1,2], Mebiala NMP [1,2], Toure YL[2,3], Toure PGLK[1,2], Sessegnon FA[1,2], Nogbou AMBY[1,2], Madiou MKA[1,2], Sako K[1,2], Grahouri JB[1,2], KOUE BEI[1,2], TOURE M[1,2] and ADOUBI I[1,2]

[1]*Faculty of Medical Sciences, Félix Houphouët-Boigny University, Abidjan, Côte d'Ivoire*

[2]*Treichville University Hospital Center, Abidjan, Côte d'Ivoire*

[3]*Faculty of Medical Sciences, Alassane Ouattara University, Bouaké, Côte d'Ivoire*

[*]**Corresponding Author:** Kouassi Kouame Konan Yvon, Department of Medicine and Medical Specialties, Faculty of Medical Sciences, Félix Houphouët-Boigny University, Abidjan, Côte d'Ivoire, Tel.: +225 0506679663, E-mail: yvonkouassi@gmail.com

Citation: Kouassi KKY, Odo BA, Mebiala NMP, Toure YL, Toure PGLK (2025) Therapeutic Outcomes and Prognostic Factors of Bladder Cancer: A Retrospective Cohort Study in Abidjan, Côte d'Ivoire, J Cancer Sci 12: 103

Abstract

Introduction: Bladder cancer treatment strategies depend on the depth of tumor invasion and the presence of metastases. Most of these therapeutic modalities are currently available and routinely utilized in Côte d'Ivoire.

Materials and Methods: We conducted a retrospective and analytical cohort study of bladder cancer cases in greater Abidjan over a five-year period. Cases were identified from urology services at Cocody University Hospital, Treichville University Hospital, and the Oncology Department at Treichville University Hospital, as well as from the National Radiotherapy Center Alassane Ouattara (CNRAO).

Results: The mean patient age was 56.6 years, with a male-to-female sex ratio of 2.48. The diagnosis was often delayed, occurring between 1 month and 2 years after symptom onset, with hematuria being the most frequently observed initial sign (84.4%). Tobacco use was the key risk factor affecting patient survival (26.6%). The most frequently performed staging investigation was CT scan of the thorax–abdomen–pelvis (CT TAP), performed in 26.6% of cases. Urothelial carcinoma was the predominant histological type (65.9%). Regarding treatment, local modalities (e.g., surgery, radiotherapy) were the most commonly employed. At the end of the study, histological type was the only factor significantly influencing survival ($p = 0.008$).

Conclusion: Bladder cancer is an infrequent malignancy in this setting, with prognosis largely dependent on diagnostic timeliness. Tobacco is the predominant carcinogenic risk factor in Côte d'Ivoire, underscoring the urgent need for national anti-tobacco control policies.

Keywords: Bladder cancer; Treatment modalities; Survival outcomes; Abidjan; Retrospective cohort study

Introduction

Bladder cancer ranks as the eleventh most commonly diagnosed cancer worldwide and the second most frequent urological malignancy after prostate cancer [1]. In 2022, it accounted for approximately 220,596 deaths globally [1]. In Africa, and particularly in Côte d'Ivoire, it occupies the second position among urological cancers and is associated with a high mortality rate [2]. Malignant bladder tumors predominantly affect male patients. The average age at diagnosis in sub-Saharan Africa is relatively younger than that observed in Western populations [3]. Multiple risk factors have been identified, with the most commonly reported including tobacco use, occupational exposure, and chronic urinary tract infections. In developing countries, urinary schistosomiasis plays a major etiological role [4, 5]. Diagnosis is primarily based on endoscopic assessment, particularly through transurethral resection of the bladder tumor (TURBT). Urothelial carcinoma is the most prevalent histological subtype. However, in schistosomiasis-endemic regions, squamous cell carcinoma and adenocarcinoma are increasingly observed [6]. The management of bladder cancer depends on the depth of wall invasion and the presence of distant metastases. Today, treatment is well standardized and integrated into a multidisciplinary approach. Local and locoregional therapies such as surgery and radiotherapy are used for localized or locally advanced disease. Systemic therapies including chemotherapy, targeted therapies, and more recently, immunotherapy are reserved for advanced and metastatic cases [7, 8]. Supportive care measures are also employed to improve patients' quality of life. Despite the disease burden, there is a scarcity of studies assessing the follow-up and management of bladder cancer patients in sub-Saharan Africa, and in Côte d'Ivoire in particular [3,6]. In light of this gap, we conducted the present study with the overall objective of contributing to improved management of bladder cancer in Côte d'Ivoire.

Materials and Methods

Study Design and Setting

This was a multicenter, retrospective, analytical cohort study conducted in Abidjan, Côte d'Ivoire, over a five-year period from January 2018 to December 2022. Data were collected from four tertiary-level healthcare facilities: the Urology Departments of the University Hospitals of Cocody and Treichville, the Oncology Department of Treichville University Hospital, and the Alassane Ouattara National Center for Radiotherapy (CNRAO).

Study Population

The study included all patients aged 18 years and older, regardless of sex, with a histologically confirmed diagnosis of bladder cancer. To be eligible, patients must have received medical and/or surgical treatment and been followed for a minimum of three months after diagnosis.

Inclusion Criteria

- Age ≥ 18 years
- Histological confirmation of bladder cancer
- Received at least one form of medical or surgical treatment
- Minimum follow-up duration of 3 months

Exclusion Criteria

- Incomplete medical records
- Patients lost to follow-up before 3 months
- Patients with non-histologically confirmed diagnosis

Data Collection

Data were retrospectively extracted from medical records using a standardized data collection form. The following variables were recorded:

Sociodemographic data: age, sex

Clinical characteristics: presenting symptoms, risk factors (e.g., smoking)

Diagnostic workup: imaging modalities used (e.g., CT scan), histologic subtype

Treatment details: surgical procedures, chemotherapy, radiotherapy

Outcomes**:** response to treatment

Outcome Measures

- **Primary outcomes:**
- Clinicopathological response

Secondary outcomes:

- Association of clinical/histologic factors with survival outcomes

Statistical Analysis

Data were analyzed using **SPSS version 12.0**. Descriptive statistics were used to summarize patient characteristics. Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequencies and percentages. Statistical significance was considered at a p-value < 0.05.

Ethical Considerations

Prior authorization for data access was obtained from the respective hospital administrations. All patient data were anonymized prior to analysis to ensure confidentiality. As this was a retrospective study based on existing clinical records, informed consent was waived in accordance with national regulations and ethical guidelines.

Results

The urology departments received the highest number of patients with bladder cancer. The most represented age group was 65 to 79 years, accounting for 36.2%. The mean age of our patients was 56.6 ± 14.7 years, with extremes of 21 and 81 years. A male

predominance was observed, with a sex ratio of 2.48. Tobacco use was the main identified risk factor, with a percentage of 26.6%, followed by freshwater bathing (24.5%). It was found that 78.7% of patients consulted between the 1st and 6th month of disease progression. Hematuria was the most frequent presenting symptom, with a percentage of 93%. Histology was dominated by urothelial carcinoma (65.9%). Thoraco-abdominopelvic CT scan was the most commonly performed staging examination. However, 89.4% of patients were not staged. Multidisciplinary team discussions were conducted in only 16% of cases. Local treatments were most commonly used in the specific management of our patients. TURBT was the most frequently performed procedure, representing 25.5% of the therapeutic approaches used. 6.3% of patients underwent first-line surgery, while only one had palliative surgery. Only two patients (2.1%) received neoadjuvant chemotherapy based on a gemcitabine–cisplatin protocol. No patient received adjuvant chemotherapy. In our study, three patients received palliative chemotherapy, accounting for 3.1%, using a gemcitabine–cisplatin protocol. 7.4% of patients received radiotherapy, including five who underwent conformal radiotherapy. However, the majority of patients did not receive specific treatment. Only one patient achieved a complete therapeutic response (1%). A progressive disease response was observed in 42.5% of cases. A total of 13 deaths (13.8%) were recorded, and 41 patients were lost to follow-up, representing 43.6% of the cases collected. The analytical study mainly focused on the parameters of age, sex, consultation delay, diagnostic delay, histological type, and therapeutic modalities in relation to patient survival. Sex was not a factor influencing survival. Age had no influence on patient survival. The consultation delay did not affect survival. The histological type influenced patient survival. Overall, treatments did not influence survival.

Table 1: Distribution by clinical departments and sociodemographic characteristics of patients

	Parameters	Number (n)	Percentage
Departments	Urology Department (CHU Treichville)	27	28.7%
	Urology Department (CHU Cocody)	28	29.7%
	Oncology Department (CHU Treichville)	14	14.8%
	CNRAO (National Radiotherapy Center)	25	26.6%
Age group (years)	20-34	9	9.6%
	35-49	23	24.5%
	50-64	26	27.6%
	65-79	34	36.2%
	> 80	2	2.1%
Sex	Female	27	28.7%
	Male	67	71.3%
Place of residence	Abidjan	52	55.3%
	Outside ofAbidjan	42	44.7%
Risk factors	smoking	25	26.6%
	History of schistosomiasis	14	14.9%
	Freshwater swimming	23	24.5%
	Chronic bladder irritation	2	2.1%
	Professional exposure	10	10.6%
	Family history of cancer	5	5.3%
	None	5	5.3%

Table 2: Distribution according to clinical characteristics of patients (n = 94)

Parameters		Number (n = 94)	Percentage
Time to consultation (months)	1 - 6	74	78.7%
	7 - 12	12	12.8%
	13 - 18	4	4.2%
	19 - 24	3	3.2%
	> 24	1	1.1%
Presenting symptoms	Hematuria	84	89.4%
	Cystitis symptom	63	67%
	Pelvic mass	26	27.6%
Histological type	Urothelial carcinoma	62	65.9%
	Squamous cell carcinoma	23	24.5%
	Others	9	9.6%
Staging Work-up	Chest X-ray + abdominopelvic ultrasound	3	3.2%
	CT scan (thorax-abdomen-pelvis)	25	26.6%
	Pelvic MRI + CT scan (thorax-abdomen-pelvis)	17	18.1%
	Pelvic MRI + chest X-ray + abdominopelvic ultrasound	2	2.1%
	None	47	50%
Stage	Localized	3	3.2%
	Locally advanced	4	4.2%
	Metastatic	3	3.2%
	Not specified	84	89.4%
Multidisciplinary Tumor Board	Yes	15	16%
	No	79	84%

Others (Sarcoma, adenocarcinoma); MRI: Magnetic Resonance Imaging

Table 3: Distribution according to therapeutic modalities

Parameters		Number (n=94)	Percentage
Surgery type	Primary surgery	6	6.4%
	Adjuvant	0	0%
	Palliative	1	1.1%
Endoscopic Treatment	TURBT	24	25.5%
	Intravesical instillation	0	0%
Radiotherapy	Radiotherapy alone	2	2.1%

	CRT	5	5.3%
Chemotherapy	Neoadjuvant	2	2.1%
	Adjuvant	0	0%
	Palliative	3	3.2%
Targeted Therapy		0	0%
Symptomatic Treatment Only		53	56.4%

TURBT: Transurethral resection of bladder tumor; CRT: Concurrent chemo radiotherapy

Table 4: Distribution according to post-treatment outcomes

Parameters		Effectifs (n=94)	Pourcentage
Response Type	Complete response	1	1%
	Partial response	16	17%
	Stable Disease	37	3.4%
	Progression	40	42.5%
Last Known Status	alive	13	13.8%
	Deceased	40	42.6%
	Lost to follow-up	41	43.6%

Table 5: Correlation analysis of factors associated with mortality

Variable		Alive	Deceased	Total	X2	pvalue
Sex	Female	4	14	18	0.0783	0.780
	male	9	26	35		
Age group (years)	20-34	1	3	4	8.2070	0.084
	35-49	5	7	12		
	50-64	1	16	17		
	65-79	5	14	19		
	≥ 80	1	0	1		
Time to consultation (months)	1–6	10	32	42	4.6399	0.32
	7–12	1	5	6		
	13–18	0	2	2		
	19–24	1	1	2		
	≥ 25	1	0	1		
Histological type	Squamous cell carcinoma	8	7	15	9.5745	0.008
	Urothelial carcinoma	5	31	36		
	Others	0	2	2		
Medical treatments	Yes	3	3	6		0.15
	No	10	37	47		

Surgical treatments	Yes	4	9	13		0.39
	No	9	31	40		

Others (Sarcoma, adenocarcinoma)

Discussion

This study nevertheless presents certain limitations. Its retrospective nature constitutes a first limitation, as it restricts the quality and accuracy of the information collected. In addition, several medical records were incomplete or poorly documented, which may have influenced the analysis. The high rate of loss to follow-up also reduced the ability to assess long-term therapeutic outcomes. Furthermore, the variability in diagnostic methods used represents another potential source of bias, likely to affect the reliability of the data.

The incidence of bladder cancer increases with age starting from 40 years. In Europe, the mean age at diagnosis is 69 years in men and 71 years in women [7]. The mean age found in our study is relatively younger, which is consistent with the findings of most African studies [9]. This may be explained by earlier exposure to bilharziasis in African countries, which accounted for only 12.2% in our study. The main risk factor identified was tobacco use, in line with data from Western and Maghreb countries [4, 10]. Similarly, as in our study, male predominance was also observed in most Western, Maghreb, and Sub-Saharan African studies [4, 6, 9, 10]. This male predominance in Africa could be attributed to the more frequent exposure of men to risk factors such as urinary bilharziasis, tobacco, and industrial carcinogens. The majority of our patients consulted after a moderately long delay, which is also reported in most African studies and is responsible for delayed diagnoses in our setting [6, 9]. Urothelial carcinoma, found in 65.9% of cases in our study, is the most frequently reported histological type in Western and Maghreb literature [4, 7, 10]. Furthermore, squamous cell carcinoma, associated with bilharziasis endemicity, is found in a higher proportion, consistent with Sub-Saharan African data [6, 9]. Although the therapeutic strategy was multimodal, it was dominated by exclusive supportive care (56.4%) due to often-late diagnosis. These treatments aimed to improve the quality of life or patient comfort [11]. Due to the large volume of some tumors, transurethral resection of the bladder (TURB) was performed in only 25.5% of cases. Total cystectomy with curative intent was rarely performed (6.4%). Chemotherapy, indicated for infiltrating tumors or as adjuvant treatment [7, 8], was rarely used. This therapeutic observation in our series strongly contrasts with practices in developed countries, where local treatments are predominantly used [11, 10], likely due to earlier diagnosis of bladder tumors. We also found in our study a high rate of patients who did not receive specific treatment, which could be explained by poor general health status and limited access to costly treatments. The high mortality rate observed in our study is similar to most Sub-Saharan African series [6, 9]. Multivariate analysis showed that the histological type, particularly urothelial carcinoma, was a mortality factor. In Sub-Saharan African series, the main contributing factors identified were delayed consultations and diagnoses, as well as postoperative complications [6, 9]. All of this may be explained by the generally low socioeconomic profile in our countries in Sub-Saharan Africa.

Conclusion

This study highlights that bladder cancer in our context affects relatively young, predominantly male patients, with delayed diagnosis and hematuria as the main symptom. Tobacco use was the leading prognostic risk factor. Urothelial carcinoma was the most common histological type. Endoscopic and surgical treatments were the most frequently used, though symptomatic management and loss to follow-up were high. Histology significantly influenced survival. Given the study's limitations (small sample size, high loss to follow-up), further prospective studies are needed to confirm these findings.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

KOUASSI KKY designed the study. ODO BA and MEBIALA NMP collected data from patient records and drafted the manuscript. All authors reviewed the final version and approved it for submission.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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