https://doi.org/10.3329/cbmj.v14i2.83278

Treatment Patterns and Survival Outcomes of Prostate Cancer in Bangladeshi Patients

*Arafat MA[1], Bhuiyan MNI[2], Akhtaruzzaman M[3], Rana M[4], Mahmud A[5], Ahmed A[6], Khan S[7]

Abstract

Prostate cancer is a growing health burden among Bangladeshi men, yet there is limited research on treatment patterns and survival outcomes in this population. Understanding the clinical management and prognostic factors is crucial for improving patient care. This study aimed to analyze the treatment modalities and survival outcomes of patients with prostate cancer. This purposive cross-sectional study was conducted from January 2022 to December 2024, including 86 histopathologically confirmed prostate cancer patients at the Bangladesh Medical College, Dhaka, Bangladesh. Data on demographics, clinical staging, treatment modalities (surgery, radiotherapy, hormone therapy, chemotherapy), and survival were collected from hospital records and patient interviews. Statistical analysis was performed using SPSS version 23.0, with Cox regression to identify prognostic factors. This study analyzed 86 prostate cancer patients (mean age 68.4 years), with 65.1% presenting at advanced stages (III-IV). Most (72.1%) received androgen deprivation therapy, while only 7.0% underwent radical prostatectomy. Median survival was 34.5 months, significantly shorter for Stage IV (22.5 months). Advanced stage (HR=3.12), high PSA (HR=2.10), and treatment delays >6 months (HR=2.34) independently predicted mortality. Prostate cancer in Bangladesh is predominantly diagnosed at advanced stages, leading to poor survival outcomes. Early detection, timely treatment, and improved access to multidisciplinary care are urgently needed to enhance prognosis and reduce mortality among Bangladeshi patients.

CBMJ 2025 July: vol. 14 no. 02 P:115-120

Keywords: Androgen deprivation therapy, Prostate cancer, Radical prostatectomy, Survival outcomes, Treatment patterns

Introduction

Prostate cancer has emerged as a major health concern in Bangladesh, where epidemiological studies indicate rising incidence rates coupled with late-stage diagnosis.[1] The disease burden reflects broader challenges in cancer care within resource-limited settings, including limited screening programs and treatment accessibility.[2] Current hospital-based data from Dhaka reveal that approximately 65% of patients present with advanced disease (Stage III or IV), significantly higher than reported in developed nations.[3] This advanced presentation correlates with poorer survival outcomes and restricts treatment options, leading to heavy reliance on androgen deprivation therapy rather than potentially curative interventions.[4] The Bangladeshi healthcare system faces unique obstacles in managing prostate cancer, including diagnostic delays and financial barriers to optimal treatment.[5] While international guidelines recommend multimodal approaches, real-world practice in Bangladesh remains constrained by

1. *Dr. Mohammad Ali Arafat, Assistant Professor, Department of Urology, Bangladesh Medical College, Dhaka, Bangladesh.
2. Dr. Mohammed Nazrul Islam Bhuiyan, Associate Professor & Amp; Head, Department of Urology, Bangladesh Medical College, Dhaka, Bangladesh.
3. Dr. Muhammed Akhtaruzzaman, Associate Professor, Department of Cardiology, Bangladesh Medical College, Dhaka, Bangladesh.
4. Dr. Masud Rana, Assistant Professor, Department of Urology, Bangladesh Medical College, Dhaka, Bangladesh.
5. Dr. Ashik Mahmud, Associate Professor, Department of Surgery, Brahmanbaria Medical College, Bangladesh.
6. Dr. Adnan Ahmed, Assistant Registrar, Department of Urology, Bangladesh Medical College, Dhaka, Bangladesh.
7. Dr. Sozib Khan, Assistant Registrar, Department of Urology, Bangladesh Medical College, Dhaka, Bangladesh.

Address of Correspondence:
Email: aliarafathira@gmail.com

infrastructure limitations and socioeconomic factors.[6] Treatment patterns show marked variation from global standards, with radical prostatectomy performed in less than 10% of eligible cases according to recent audits.[7] These disparities highlight the urgent need for context-specific clinical data to inform practice guidelines and health policy decisions. This hospital-based study examines treatment patterns and survival outcomes among prostate cancer patients, focusing on identifying prognostic factors through Cox regression analysis. We investigate how variables including clinical stage, PSA levels, and treatment delays influence survival in this population. Our findings aim to bridge critical knowledge gaps and provide evidence to optimize prostate cancer management within Bangladesh's healthcare framework.[8] The study's emphasis on real-world treatment utilization and prognostic factors responds to the pressing need for localized data to guide clinical decision-making and resource allocation.[9]

Methods

This hospital-based, cross-sectional study was conducted Bangladesh Medical College, Dhaka, Bangladesh from January 2022 to December 2024. We purposively recruited 86 histopathologically confirmed prostate cancer patients for this study.

Inclusion criteria

- Patients with histopathologically confirmed prostate cancer
- Availability of complete medical records
- Willingness to participate in structured interviews

Exclusion criteria

- Patients with missing or incomplete clinical data
- Those who refused to provide consent
- Cases with concurrent malignancies

Data collection and procedures

Data were collected through medical record review and structured patient interviews, capturing demographic characteristics (age, residence, socioeconomic status), clinical parameters (PSA levels, Gleason score, TNM stage), treatment modalities (surgery, radiotherapy, hormone therapy, chemotherapy), and survival outcomes (time from diagnosis to death or last follow-up). Diagnosis was confirmed via transrectal ultrasound-guided biopsy and histopathology, with clinical staging following the 8th edition AJCC TNM classification. Treatment patterns were categorized into radical prostatectomy, radiotherapy, androgen deprivation therapy (ADT), or combination therapies.

Statistical analysis

Data were analyzed using SPSS version 23.0. Cox proportional hazards regression models were employed to identify prognostic factors, with results reported as adjusted hazard ratios (HR) and 95% confidence intervals (CI). Variables showing a p-value < 0.25 in univariate analysis were included in the multivariate regression models to determine independent predictors of survival outcomes.

Results

The study analyzed 86 prostate cancer patients with a mean age of 68.4 years (SD ±8.2). Most participants (65.1%) presented with advanced-stage disease (Stage III-IV), reflecting delayed diagnosis patterns in our setting. Urban residents comprised 72.1% of cases, while 58.1% reported monthly incomes below 20,000 BDT. Clinical evaluation revealed 62.8% of patients had PSA levels >20 ng/mL at diagnosis, with 51.2% exhibiting high-grade tumors (Gleason score ≥8). Comorbidities were prevalent, including hypertension (39.5%) and

diabetes (27.9%), which may have influenced treatment decisions and outcomes. Treatment patterns showed heavy reliance on androgen deprivation therapy (72.1%), while only 7.0% underwent radical prostatectomy, primarily those with localized disease. Survival analysis demonstrated significant stage-dependent outcomes. The overall median survival was 34.5 months (95% CI: 28.2-40.8), with Stage IV patients surviving only 22.5 months compared to Stage I-II patients, where median survival was not reached during follow-up. Cox regression identified advanced stage (HR=3.12), elevated PSA (HR=2.10), and treatment delays >6 months (HR=2.34) as significant mortality predictors in univariate analysis. These remained significant after multivariate adjustment, confirming their independent prognostic value.

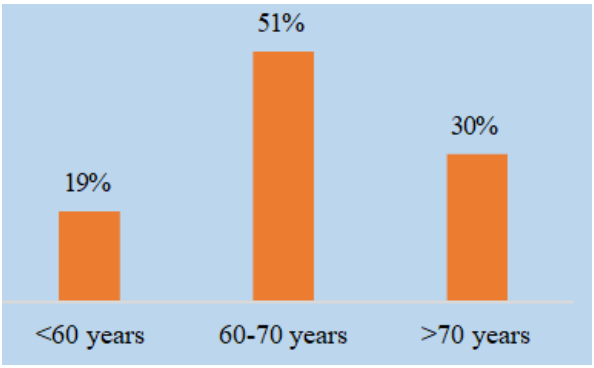

Figure 1: Age distribution of cases

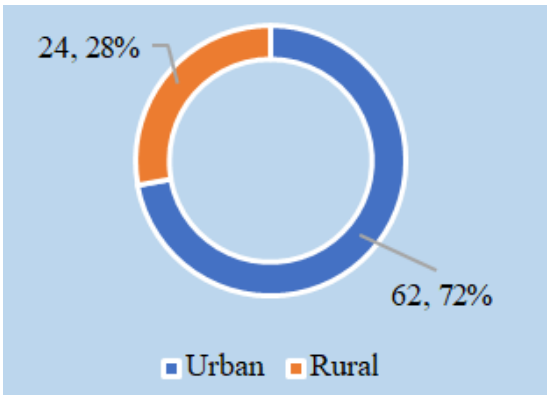

Figure 2: Gender distribution of cases

Table 1: Clinical Parameters

Parameter	n	%
PSA Level		
≤10 ng/mL	16	18.6%
10-20 ng/mL	16	18.6%
>20 ng/mL	54	62.8%
Gleason Score		
≤6	20	23.3%
7	22	25.6%
≥8	44	51.2%

Table 2: Treatment modalities

Treatment	n	%
ADT only	62	72.1%
ADT + Radiation	18	20.9%
Prostatectomy	6	7.0%

ADT: Androgen deprivation therapy

Table 3: Survival by stage

Stage	Median Survival (months)	95% CI
I-II	NR*	-
III	42.1	35.5-48.7
IV	22.5	18.3-26.7

NR: Not reached

Table 4: Univariate cox analysis

Factor	HR	95% CI	p-value
Stage IV	3.12	1.45-6.71	<0.001
PSA >20 ng/mL	2.1	1.22-3.60	0.007

HR: Hazard ratio, PSA: Prostate-specific Antigen

Table 5: Multivariate Cox analysis

Factor	aHR	95% CI	p-value
Stage IV	2.85	1.30-6.25	0.009
Treatment delay	2.1	1.05-4.20	0.036

Discussion

The present study provides critical insights into the treatment patterns and survival outcomes of prostate cancer in Bangladeshi patients, highlighting significant challenges in diagnosis, management, and prognosis. Our findings reveal that a majority of patients (65.1%) presented with advanced-stage disease (Stage III-IV), consistent with reports from other low- and middle-income countries (LMICs) where delayed diagnosis is common due to limited screening and healthcare access.[10] The mean age at diagnosis (68.4 years) aligns with global trends, though the predominance of advanced-stage cases underscores systemic delays in seeking medical care in our setting.[11] The high proportion of patients (62.8%) with PSA levels >20 ng/mL at diagnosis further reflects late- stage presentation, as elevated PSA is strongly associated with advanced disease.[12] This is compounded by the fact that 51.2% had high-grade tumors (Gleason score ≥8), which are linked to aggressive disease and poorer outcomes.[13] The prevalence of comorbidities such as hypertension (39.5%) and diabetes (27.9%) may also complicate treatment decisions, as these conditions often necessitate modifications to standard cancer therapies.[14] Treatment patterns in our cohort were heavily skewed toward androgen deprivation therapy (ADT) (72.1%), with only 7.0% undergoing radical prostatectomy—a finding consistent with studies from similar resource-limited settings where surgical interventions are underutilized.[15] The reliance on ADT may be attributed to the advanced stage at presentation, financial constraints, and limited access to specialized surgical or radiation oncology services.[16] However, the underuse of curative treatments for localized disease raises concerns about missed opportunities for improved survival, as radical prostatectomy and radiotherapy have demonstrated better long-term outcomes in early-stage prostate cancer.[17] Survival analysis revealed a median overall survival of 34.5 months, with stark disparities between stages—Stage IV patients survived only 22.5 months compared to Stage I-II patients, where median survival was not reached. These findings align with global data showing that advanced-stage prostate cancer carries a significantly worse prognosis.[18] Our Cox regression analysis identified advanced stage (HR=3.12), elevated PSA (HR=2.10), and treatment delays >6 months (HR=2.34) as independent predictors of mortality, reinforcing the importance of early detection and timely intervention.[19,20] These factors have been similarly linked to poor outcomes in other populations, suggesting that strategies to reduce diagnostic and treatment delays could substantially improve survival.[20] The urban predominance (72.1%) in our study may reflect healthcare access disparities, as rural populations in Bangladesh often face greater barriers to cancer diagnosis and treatment.[21] Additionally, the economic burden is evident, with 58.1% of patients reporting monthly incomes below 20,000 BDT, potentially limiting their ability to afford advanced therapies.[7] These socioeconomic factors must be addressed through policy interventions, including expanded screening programs and subsidized treatment options.[22]

Limitations

The small sample size and single-center design of this study may limit generalizability. Additionally, retrospective data collection could introduce selection bias. Longer follow-up and multicenter studies are needed to validate these findings and better assess survival trends in Bangladesh.

Conclusion

This study highlights critical gaps in prostate cancer management in Bangladesh, where most patients present with advanced-stage disease and face limited treatment options. The heavy reliance on androgen deprivation therapy and low rates of curative interventions underscore systemic challenges in early detection and specialized care access. With advanced stage, high PSA, and treatment delays significantly worsening survival, urgent public health interventions are needed to implement screening programs, reduce diagnostic delays, and expand access to multidisciplinary treatment to improve patient outcomes.

References

1. *Raisa, Aantaki, et al. "A systematic scoping review of cancer communication about prevention and detection in Bangladesh." Expanding Horizons in Health Communication: An Asian Perspective (2020): 223-248.*
2. *Hussain, Syed Md Akram. "Comprehensive update on cancer scenario of Bangladesh." South Asian journal of cancer 2.4 (2013): 279.*
3. *Rahman, Mohammad Mukhlesur, et al. "Frequency of Prostate Cancer Among the Prostatic Tissue Samples-Collected from Different Tertiary Level Hospitals in Dhaka City." Bangladesh Journal of Urology 21.2 (2018): 88-92.*
4. *Kirby, Mike, Ceri Hirst, and E. D. Crawford. "Characterising the castration-resistant prostate cancer population: a systematic review." International journal of clinical practice 65.11 (2011): 1180-1192.*
5. *Litwin, Mark S., and Hung-Jui Tan. "The diagnosis and treatment of prostate cancer: a review." Jama 317.24 (2017): 2532-2542.*
6. *Mohler, James L., et al. "Prostate cancer, version 2.2019, NCCN clinical practice guidelines in oncology." Journal of the National Comprehensive Cancer Network 17.5 (2019): 479-505.*
7. *Hossain, Mohammad Sorowar, et al. "Epidemiology of childhood and adolescent cancer in Bangladesh, 2001–2014." BMC cancer 16 (2016): 1-8.*
8. *Sharma, Karishma, Shahin Sayed, and Mansoor Saleh. "Promoting best practice in cancer care in sub Saharan africa." Frontiers in Medicine 9 (2022): 950309.*
9. *Biswas, Md Mamun Ali, et al. "Expression of Estrogen Receptor, Progesterone Receptor and HER-2/Neu among Bangladeshi Women with Invasive Breast Cancer at a Tertiary Care Hospital." Journal of Enam Medical College 11.3 (2021): 185-189.*
10. *Rebbeck, Timothy R. "Prostate cancer disparities by race and ethnicity: from nucleotide to neighborhood." Cold Spring Harbor perspectives in medicine 8.9 (2018): a030387.*
11. *Rawla, Prashanth. "Epidemiology of prostate cancer." World journal of oncology 10.2 (2019): 63.*
12. *Loeb, Stacy, et al. "Overdiagnosis and overtreatment of prostate cancer." European urology 65.6 (2014): 1046-1055.*
13. *Epstein, Jonathan I., et al. "Contemporary Gleason grading of prostatic carcinoma: an update with discussion on practical issues to implement the 2014 International Society of Urological Pathology (ISUP) consensus conference on Gleason grading of prostatic carcinoma." The American journal of surgical pathology 41.4 (2017): e1-e7.*
14. *Taylor, Kathryn L., et al. "Treatment preferences for active surveillance versus active treatment among men with low-risk prostate cancer." Cancer epidemiology, biomarkers & prevention 25.8 (2016): 1240- 1250.*
15. *Rine, Sarah, et al. "The impact of the COVID-19 pandemic on cancer care including innovations implemented in Sub-Saharan Africa: A systematic review." Journal of Global Health 13 (2023): 06048.*
16. *Yap, Mei Ling, et al. "Global access to radiotherapy services: have we made progress during the past decade?" Journal of global oncology 2.4 (2016): 207-215.*

17. *Weiner, Adam B., et al. "Cause of death during prostate cancer survivorship: a contemporary, US population–based analysis." Cancer 127.16 (2021): 2895-2904.*

18. *Culp, MaryBeth B., et al. "Recent global patterns in prostate cancer incidence and mortality rates." European urology 77.1 (2020): 38-52.*

19. *Beyer, Katharina, et al. "Diagnostic and prognostic factors in patients with prostate cancer: a systematic review." BMJ open 12.4 (2022): e058267.*

20. *Heidenreich, Axel, et al. "EAU guidelines on prostate cancer. Part II: Treatment of advanced, relapsing, and castration-resistant prostate cancer." European urology 65.2 (2014): 467-479.*

21. *Islam, Sheikh Mohammed Shariful, et al. "Non-Communicable Diseases (NCDs) in developing countries: a symposium report." Globalization and health 10 (2014): 1-8.*

22. *Ginsburg, Ophira, et al. "Changing global policy to deliver safe, equitable, and affordable care for women's cancers." The Lancet 389.10071 (2017): 871-880.*