International Journal of Research in Medical Sciences
Nahar S et al. Int J Res Med Sci. 2026 Feb;14(2):404-409
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20260220

Original Research Article

Assessment of the status of inoperable cervical cancer patients treated in a selected hospital: a single-center, observational study

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Received: 26 October 2025
Revised: 09 December 2025
Accepted: 20 January 2026

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ABSTRACT

Background: Cervical cancer remains a leading cause of cancer-related morbidity and mortality in low-resource settings. This study aimed to assess the socio-demographic and clinical characteristics of inoperable cervical cancer patients treated at a tertiary care hospital in Bangladesh.
Methods: A single-centered, observational study was conducted using retrospective data from patients diagnosed with inoperable cervical cancer. Patient demographics, tumor staging, histopathological features, and treatment modalities were analyzed. Statistical associations between variables were evaluated using chi-square and Fisher's exact tests.
Results: The mean age of patients was 48.94 years, with 61.1% aged between 41 and 60. Over half (55.6%) were married at or before age 15, and 79.2% had three or more children. Most patients (83.3%) reported using oral contraceptives, and 23.6% had a family history of cancer. Stage IIB was the most common FIGO stage (52.8%), and squamous cell carcinoma (SCC) was the predominant histological type (73.6%). Tumor grade II was most frequent (73.6%). Standard chemoradiation was administered, including weekly cisplatin, external beam radiotherapy (EBRT) (mean dose 48.94 Gy), and intracavitary brachytherapy (80.6% received 21 Gy in three insertions). No significant associations were found between histopathological type (HPR) and stage (p=0.334) or family history and stage (p=1.000).
Conclusions: The study reveals a pattern of late-stage cervical cancer diagnosis in middle-aged women with identifiable socio-demographic risk factors. Strengthening early screening and awareness initiatives is critical to reducing the burden of inoperable cases in Bangladesh.

Keywords: Inoperable cervical cancer, FIGO stage IIB-IVA, chemoradiation, socio-demographic risk factors, Bangladesh

INTRODUCTION

Cervical cancer remains a formidable public-health challenge, ranking fourth among female malignancies worldwide with an estimated 662 000 new cases and 348 900 deaths in 2022.[1,2] Although the disease is preventable, a stark equity gap persists: almost 94 % of cervical-cancer deaths now occur in low- and middle-income countries (LMICs), where organized screening and human papillomavirus (HPV) vaccination have yet to attain meaningful coverage.[2,3] Comparative analyses of 204 LMICs reveal median screening uptake below 5%, with marked pro-urban and pro-rich differentials.[4,5] Likewise, global coverage estimates show that by 2019 only 15% of adolescent girls in LMICs had received the full two-dose HPV vaccine series, far short of the 90% target articulated

by the world health organisation (WHO) elimination roadmap.[4,6] The situation in Bangladesh is also alarming. GLOBOCAN 2023 estimates indicate 9,640 incidents of cervical-cancer cases and 5,826 deaths annually, corresponding to age-standardized incidence and mortality rates of 11.3 and 7.0 per 100 000 women, respectively; the malignancy is the nation's second most common female cancer, threatening a susceptible population of roughly 64 million women.[7,8] If current trajectories persist, modelling predicts that Bangladesh could witness more than 156,000 additional cervical-cancer cases and nearly 109,000 deaths by 2070, with cumulative mortality exceeding half a million by 2120.[9,10] These projections are underpinned by persistently late presentation: the national VIA registry documented only 2.7 % screening coverage among eligible women in 2022 despite more than 600 sites.[11] Qualitative evidence highlights that in LMICs, multifactorial barriers, stigma, spousal permission, indirect costs, and limited colposcopy capacity that collectively funnel women toward care only when disease is advanced and often surgically inoperable.[12] Clinically, "inoperable" cervical cancer encompasses bulky IB3 and IIA2 tumours (≥4 cm) and all locally advanced stages ≥ IIB, in which radical hysterectomy confers no oncological advantage.[13] Outcomes are consequently inferior: five-year survival in Bangladesh falls below 50% for stage ≥IIB despite treatment, and quality-of-life analyses consistently document higher pain scores and poorer functional status among women with advanced disease.[14] Despite this clinical imperative, Bangladeshi literature remains largely descriptive. Existing hospital audits report aggregate demographics and broad stage distributions yet omit granular staging (e.g., IB2 vs IIIB), histology-by-stage matrices, or clear documentation of surgical infeasibility.[11,15] A recent scoping review concluded that no local study has systematically profiled women deemed inoperable at presentation.[11] This evidentiary void undermines rational resource allocation for chemoradiation, brachytherapy, and palliative supportive care. Building on this rationale, the present study aims to characterize the sociodemographic factors, clinical-pathological spectrum, and treatment patterns of women presenting with inoperable cervical cancer at a tertiary center in Bangladesh.

METHODS

This observational, cross-sectional study was conducted at the department of clinical oncology, Bangladesh medical university (Former BSMMU), Dhaka, Bangladesh, from January 2023 to December 2023. A total 72 female patients diagnosed with inoperable cervical cancer were included using purposive sampling. Inclusion criteria were histologically confirmed cervical cancer cases deemed inoperable based on FIGO staging (>IB2, IIA2, bulky IB3 and IIA2 or more advanced stages), receiving chemo-radiotherapy with curative or palliative intent. Patients were excluded if they were older than 70 years, had early-stage operable disease (FIGO≤IB2), or had received prior treatment for cervical cancer, with severe renal, hepatic, or cardiac illness, an ECOG performance status of 3 or 4, incomplete medical records, or refusal to undergo treatment or provide clinical information. Data were collected prospectively from OPD and indoor patients, including sociodemographic variables (age, age at marriage, education level, parity, oral contraceptive pill use, and family history of cancer), clinical and pathological variables (FIGO stage, histological subtype, and tumor grade), and treatment details (intracavitary brachy-radiotherapy, EBRT and chemotherapy). Histopathological classifications were based on pathology reports and tumor grading followed standard criteria. Staging was performed using clinical examination and imaging in accordance with FIGO 2018 guidelines. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize the data. Associations between categorical variables were analyzed using cross-tabulations. All analyses were performed using SPSS software, version 25.0. Ethical approval was obtained from the institutional review board of BMU, and patient confidentiality was strictly maintained throughout the study.

RESULTS

The majority of patients (61.1%) were aged between 41-60 years, with a mean age of 48.94 years, indicating a mid-life onset of inoperable cervical cancer. Early marriage (≤15 years) was reported in 55.6% of cases, highlighting a sociocultural risk factor. Educational status was predominantly low, with 57% having only primary or no formal education. A high proportion of women (79.2%) had three or more children, and 83.3% reported oral contraceptive pill use. Family history of cancer was noted in 23.6% of patients, though the majority (76.4%) had no such history (Table 1).

Over half of the patients (52.8%) were diagnosed at FIGO stage IIB, with another 32% presenting at stages IIIB, IIIC, or IVA, indicating a late-stage disease burden. Tumor grading revealed that 73.6% of the tumors were moderately differentiated (Grade II), while poorly differentiated tumors (Grade III) accounted for only 9.7%. SCC was the dominant histological subtype (73.6%), followed by "others" (16.7%) and adenocarcinoma (9.7%) (Table 2).

Most patients (80.6%) underwent the standard three-insertion schedule of intracavitary radiotherapy (ICRT) (21 Gy), while 19.4% received four insertions (24 Gy), likely reflecting residual disease or treatment adaptation. The mean dose of EBRT was 48.94 Gy. All patients received weekly cisplatin chemotherapy, consistent with conventional treatment protocols for inoperable cervical cancer (Table 3).

SCC was present across all FIGO stages, with no consistent pattern of association between cancer stage and histological subtype. Adenocarcinomas were slightly more concentrated in stage IIB, while "other" variants appeared

sporadically. The association between stage and histopathology was not statistically significant (p=0.334), suggesting that histological type does not significantly influence stage at presentation (Table 4).

Table 1: Demographic characteristics of the study population.

Characteristics	Categories	N	Percentage (%)
Age (in years)	21-40	21	29.2
	41-60	44	61.1
	61-80	7	9.7
	Mean±SD	48.94	
Age of marriage (in years)	≤15	40	55.6
	>15	32	44.4
Education level	Illiterate	12	16.7
	Primary	29	40.3
	Secondary	21	29.2
	Higher secondary	8	11.1
	Graduate or above	2	2.8
Oral contraceptive pill use	Yes	60	83.3
	No	12	16.7
Family history of cancer	Yes	17	23.6
	No	55	76.4
Para (Number of children)	1-2	15	20.8
	≥3	57	79.2

Table 2: Clinical characteristics of the study population.

Characteristics	Categories	N	Percentage (%)
FIGO stage	IB3	9	12.5
	IIA2	2	2.8
	IIB	38	52.8
	IIIA	3	4.2
	IIIB	6	8.3
	IIIC	7	9.7
	IVA	7	9.7
Tumor grade	Grade I	12	16.7
	Grade II	53	73.6
	Grade III	7	9.7
HPR	SCC	53	73.6
	Adenocarcinoma	7	9.7
	Others	12	16.7

Table 3: Treatment modalities received.

Treatment type	Categories	N	Percentage (%)
ICRT	3 Insertions (21 Gy)	58	80.6
	4 Insertions (24 Gy)	14	19.4
EBRT	Mean dose	48.94 Gy	
Chemotherapy	Inj. Cisplatin	Weekly	

Table 4: Association between stage and HPR.

Stages	Adenocarcinoma	Others	SCC	P value
IB3	2	5	2	
IIA2	0	0	0	
IIB	4	5	29	
IIIA	0	0	3	0.334
IIIB	0	1	5	
IIIC	1	1	5	
IVA	0	0	7	

Distribution of family history across stage groups showed no significant association (p=1.000). Among patients with a positive family history, 50% were diagnosed at stage IIB, 28.6% in advanced stages (III-IVA), and 21.4% in early stages (IB3-IIA2). The similar distribution of positive and negative family history across stage categories indicates that family history is not a significant predictor of stage at diagnosis in this population (Table 5).

DISCUSSION

The current observational study aimed to review the sociodemographic, clinical, and treatment profile of women diagnosed with inoperable cervical cancer at a tertiary referral center in Bangladesh, and the findings reveal a consistent pattern of late-stage presentation, histological predominance of SCC, and standard adherence to radiotherapeutic protocols.

The mean age of the cohort was 48.94 years, with the majority (61.1%) falling within the 41-60-year age range, aligning with previous studies from similar low- and middle-income settings. Thulaseedharan et al reported comparable age distributions in a rural Indian cohort, underscoring the susceptibility of middle-aged women to cervical cancer in South Asia, often due to cumulative reproductive risk exposure and limited screening access.[16]

Early marriage was another notable finding, with 55.6% of women married at or before the age of 15. This observation resonates with the study of Sanjose, who highlighted a strong nexus between early marital age and cervical cancer incidence, particularly in regions with socio-cultural norms encouraging early marriage.[17] The high prevalence of early sexual debut likely contributes to prolonged HPV exposure and heightened disease risk.

Educational background further reinforced vulnerability, with 57% of the women having no formal education or only primary schooling. Ndejjo et al emphasized that low educational attainment is a significant barrier to cervical cancer screening, leading to delayed diagnosis and advanced disease presentation.[18] Similarly, the high parity observed (79.2% with ≥3 children) is consistent with findings from Thulaseedharan et al who reported parity as a reproductive risk factor, likely due to hormonal changes and cervical trauma during childbirth.[16]

An overwhelming majority (83.3%) reported oral contraceptive pill (OCP) use, possibly reflecting prolonged hormonal exposure without adequate monitoring. This pattern has also been observed in other South Asian studies, suggesting a need for better reproductive health counselling and supervision regarding long-term OCP use.[16]

Although 23.6% of patients reported a family history of cancer, statistical analysis revealed no significant association with disease stage at diagnosis (p=1.000). These findings are in line with Moosazadeh et al who found no elevated cervical cancer risk in women with a positive family cancer history in their cohort study.[19] Likewise, Negri et al concluded that hereditary factors such as a family history of breast or female genital tract neoplasms were not significantly associated with cervical cancer incidence, indicating that familial influence may be less pronounced than environmental or behavioral factors in this population.[20]

Clinically, the majority of cases (52.8%) were diagnosed at FIGO stage IIB, with an additional 32% presenting at even more advanced stages (IIIB, IIIC, and IVA). These findings underscore a substantial delay in detection and reflect trends observed in Anggraeni et al who found that most cervical cancer patients in Indonesia were diagnosed at IIB or later.[21] The late-stage diagnosis indicates systemic gaps in screening, awareness, and health-seeking behavior, particularly in low-resource settings.

Histopathologically, SCC was the dominant subtype (73.6%), followed by adenocarcinoma (9.7%) and other variants (16.7%). These proportions are comparable to those found in multicentric studies by Yang et al and Ye et al where SCC remained the most prevalent type across all stages.[22,23] Importantly, no statistically significant association was found between stage and HPR (p=0.334), supporting findings from Teke et al and Liang et al who reported that histological subtype alone does not reliably predict disease stage or prognosis in early and advanced cases.[24,25]

Treatment-wise, 80.6% of patients received three insertions of ICRT totalling 21 Gy, while 19.4% underwent four insertions at 24 Gy. The mean dose of EBRT was 48.94 Gy. These dosing schedules are consistent with WHO guidelines, which recommend a combined EBRT + ICRT approach for radical treatment in inoperable cervical cancer.[26] Gupta et al further validated these regimens in a randomized study, confirming that a standard ICRT schedule interdigitated with EBRT is both safe and effective.[27] Similarly, the administration of weekly cisplatin chemotherapy in all patients corresponds with global recommendations and clinical trials, establishing it as a cornerstone of concurrent chemoradiation in locally advanced disease.[28]

Finally, when staging was grouped into early, mid, and advanced categories, there was no significant difference in family history distribution (p=1.000), further corroborating the limited role of familial predisposition in determining clinical severity. This reinforces findings by Bellinger et al who noted that while family history may influence screening behaviours, it does not appear to affect disease biology or progression.[29]

In summary, the study findings reflect persistent socio-cultural, reproductive, and healthcare system challenges in managing cervical cancer in Bangladesh. The results are largely consistent with patterns reported across South and Southeast Asia, reinforcing the need for strengthened early

screening, public education, and accessible treatment protocols.

This study has several limitations. First, its single-center design and relatively small sample size limit the generalizability of the findings. Second, the observational nature of the study precludes establishing causal relationships between sociodemographic factors and the presentation of advanced disease. Finally, important variables such as HPV status, treatment-related toxicities, and long-term survival outcomes were not assessed due to resource constraints. These limitations should be considered when interpreting the results.

CONCLUSION

This single-centered observational study highlights the alarming prevalence of inoperable cervical cancer among middle-aged women in Bangladesh, with a substantial proportion diagnosed at stage IIB or beyond, where curative surgery is no longer feasible. Early age at marriage, low educational attainment, high parity, and extensive use of oral contraceptives were frequently observed, underscoring socio-demographic and reproductive risk patterns associated with delayed diagnosis. Despite the advanced stage at presentation, the dominant histopathological subtype remained SCC, and no significant association was found between histology or family history with cancer stage, suggesting that other modifiable factors may be more influential in disease progression. The treatment protocol followed the standard approach of concurrent chemoradiation with cisplatin, intracavitary brachytherapy, and EBRT, consistent with global guidelines. These findings emphasize the urgent need for proactive screening, public health education, and timely referral to improve early detection and reduce the burden of inoperable cervical cancer in similar low-resource settings.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The authors also thank all the clinical staff and patients who participated in this study. The authors acknowledge Beximco Pharmaceuticals Limited for providing logistical and technical support

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Cite this article as: Nahar S, Haque MS, Hossain RZ, Anika AS, Ahmed F, Rashid MHO, et al. Assessment of the status of inoperable cervical cancer patients treated in a selected hospital: a single-center, observational study. Int J Res Med Sci 2026;14:404-9.