ORIGINAL ARTICLE

Socio-demographic and Clinico-pathological Profile of Cervical Cancer Patients at a Tertiary Care Centre in New Delhi: A Five-Year Retrospective analysis

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Abstract

Background: Cervical cancer remains a major public health challenge in low and middle-income countries including India. However, if detected early, it is preventable and curable. **Objective:** The present study aimed to ascertain the sociodemographic and clinical profile of cervical cancer patients visiting a tertiary cancer center. **Methodology:** A retrospective study was carried out at the Delhi State Cancer Institute, New Delhi. The study population included 136 women who were diagnosed with cervical cancer. A pretested data extraction sheet was used as the study tool for collecting information from the inpatient records. Descriptive analysis and chi-square test were performed and the level of significance was set at $p<0.05$. **Results:** A total of 136 cervical cancer patients with mean age of 46 ± 9.85 and mean BMI of 23.78 ± 5.03, were studied retrospectively. About 36.8% of patients were aged between 40-49 years and 57.4% were illiterate. While 40.4% of the patients belonged to FIGO stage II, 27.2% had FIGO stage III cancer. Majority (63.2%) of patients were diagnosed with squamous cell carcinoma (SCC), while the rest were adenocarcinoma (25%) and adenosquamous (11.8%). Clinical stage of cancer was found to be significantly associated with educational status ($p=0.03$) and dietary practices ($p=.007$). **Conclusion:** Our study found higher percentage of women with stage II and III cervical lesions and reaffirms the importance of education and healthy diet in early detection and prevention of cervical cancer. Therefore, it is suggested that accelerated population awareness and screening, incorporating digital innovations including vaccination programs are mandatory.

Keywords

Cervical cancer; Clinico-pathology; Epidemiology; Screening; Public Health

Introduction

Cervical cancer is the most common gynecological malignancy in women and remains a public health problem, particularly in low and middle-income countries (LMICs) including India (1). It is the fourth highest morbidity and mortality causing cancer world over, contributing to an estimated 604,127 cases and 341,831 deaths in 2020 with LMICs harboring about 90% of all cervical cancer deaths (2). In India, it is the second most common cancer among women with 123,907 new cases and 77,348 deaths with a five-year prevalence of 42.82 per 100,000 (3, 4). Based on the differential clinico-pathological features, cervical cancer can be classified into squamous cell carcinoma (SCC), adenocarcinoma, adeno-squamous carcinoma and neuroendocrine carcinoma. However, SCC and adenocarcinoma contribute to the greatest burden globally and in India (5). Several

epidemiological risk factors are associated with the pathology of cervical cancer. Most prominently, Human Papillomavirus (HPV) infection is the principal causative agent with about 80% of cervical cancers attributable to the two high risk HPV types; 16 and 18 (6,7,8). Other crucial factors include early age at marriage and first childbirth, multiparity, having multiple sex partners, smoking, lack of awareness of cervical cancer, along with inadequate menstrual hygiene practices (9-10-13). Population-based cancer registries have emphasized the need for HPV vaccination along with increasing awareness of cervical cancer in women (14). However, inadequate primary healthcare infrastructure, limited skilled manpower and out of pocket expenses are major lacuna in accelerating screening including vaccination programs for controlling the burden of cervical cancer in India (15-16).

Aims & Objectives

To determine the socio-demographic characteristics and clinic-pathological profile of cervical cancer patients.

Material & Methods

Study design and case selection: A retrospective study based on hospital records of Delhi State Cancer Institute was conducted from January 2020 to March 2020. The population selected for this study included 136 women who were diagnosed with cervical cancer and presented to the Delhi State Cancer Institute from January 1, 2014 to December 31, 2018 for treatment and surgery. Patients who were registered before the study period and already on treatment were excluded from the study. Due ethical clearance was obtained from Amity University Uttar Pradesh, Noida and Delhi State Cancer Institute, New Delhi.

Risk factor profiling and staging: Sociodemographic and risk factor profile including age, education, marital status, diet, parity, BMI were recorded along with clinic-pathological details like presenting symptoms, tumour stage, tumor histology, were obtained from pathological reports in hospital patient records. The data were extracted from the inpatient records kept at the Medical Records Department (MRD) of DSCI. Hospital MRD was visited by investigators and they individually went through patient case sheets for available information and staged cancer as per FIGO (International Federation of Gynecology and Obstetrics) criteria. All the collected information was kept confidential and stored in password protected files.

Statistical analysis: The information obtained from the data extraction sheet was entered and analyzed using SPSS Version 24.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics such as mean, median and percentage were calculated. Descriptive analysis was performed and value of $P < 0.05$ was considered as statistically significant. Association between variables of importance was tested using Chi-square test.

Results

Our study included 136 women with mean age of 46 ± 9.85 and mean BMI of 23.78 ± 5.03 at enrolment. Majority of women (36.8%) were aged between 40-49 years and 57.4% women were illiterate. About 19.9% (n=27) women were non-vegetarians with 17.6% of the study participants being underweight and 12.5% were found to be obese (Table 1).

Most common presenting symptoms of cancer cervix patients included white and foul-smelling discharge (n=28, 20.6%), abdominal pain (n=30, 22.1%) and post-menopausal bleeding (n=20, 14.7%) (Table 2). Regarding the staging of the disease, majority belonged to stage II (40.4%) and stage III (27.2%). Among the various histologically types of carcinoma cervix, majority (63.2%) were of SCC type, while adenocarcinoma was found among 25% of study participants with 23.5% participants having history of diabetes mellitus. After treatment, about 32(23.5%) study participants presented with recurrent tumour at distant sites and about 22.1% (n=30) study participants presented with treatment complications (Table 2)

Of the 136 cervical cancer patients, a slightly higher proportion of women with age >40 years presented in late stages of the disease (n = 21, 25%) compared to women <40years of age (n = 10, 28.6%), however the difference was not statistically significant (P = 0.934). Similarly, a higher proportion of women who had normal weight (n=16, 30.2%) presented in late stage of disease compared to women who were underweight (n=7, 29.2%) and overweight 4(23.7%) but statistical significance was not found (p=.474). Interestingly, stage of disease was found to be significantly associated with both education status (p=0.03) and dietary practices (p=.007) (Table 3)

On studying the association between staging of cervical cancer and clinical profile of patients, it was observed that women with higher parity (>2) showed a higher proportion of late presentation (n = 17, 36.2%) compared to women with a lower parity (n=20, 22.5%). It was also seen that women suffering from diabetes mellitus (n=9, 28.1%) showed late presentation compared to women without diabetes mellitus (n=28, 26.9%), but this difference was not statistically significant (p=.925). Evidently, women who suffered from complications during treatment (n=9, 30%) had presented at a higher stage of cancer (Table 4).

Discussion

Cervical cancer is a highly preventable women cancer and can be effectively controlled through accelerated population-based screening programmes including high risk communities, given the long latent period of intraepithelial neoplasia, which can be easily detectable through Pap-smear test (17). Although, in developed countries, robust large-scale screening programs have shown a significant decline in the incidence of cervical

cancer (18), however, its country-wide deployment in LMICs such as India, having scarcity of trained manpower, inadequate healthcare infrastructure and poor awareness of cervical cancer have not yet been completely feasible (19). Cervical cancer can develop in women of all ages, but it usually develops in women aged 35-55 years with the peak age of incidence varying among different population (20). The median age of cervical cancer patients in our study is 45 years. Similar finding has been reported by Arbyn and colleagues (21), where cervical cancer mostly affected middle-aged women, especially in resource limited countries. Studies done by Sankaranarayanan et al. (22) among 452 cervical cancer patients in Kerala reported a higher median age of 54.7 years. This older age indicates a relative lack of awareness and access to adequate and equitable screening facilities for cervical cancer in our country (23). Age has a significant effect on the timing and frequency of cancer screening as demonstrated in a study by Sawaya et al. (24). It has been previously established that lifestyle and dietary choices play a pivotal role in the etiopathology and clinical prognosis of cervical cancer (25). Our findings also re-affirm this observation that dietary choices are indeed significantly associated with cervical cancer ($p< 0.007$).

Our study shows that although multiparous women were diagnosed at higher stage of cervical cancer, yet this association was not statistically significant. However, it is well established that multiparous women are at a higher risk of cervical cancer (26). Similar findings have also been reported in a retrospective study conducted in a tertiary care hospital in Mangalore (27,28). Educating women regarding adoptive reproductive and sexual health practices could significantly allow behavioral change consequently reducing risk factor exposure and cervical cancer incidence. Another significant finding in the study was that 27.2% women were diagnosed in late stages of the disease. This had a statutory impact on the clinical prognosis of the patients with limited treatment options. Similar observations have also been reported in a retrospective study by Srivastava et al. (29). The probable causes for late presentation and poor prognosis of cervical cancer among women are varied. They include lack of awareness among women, cultural factors, lack of centralized policies regarding cancer prevention and HPV vaccination (30).

Majority of study participants (57.4%) were illiterate with only 22.1% of the patients educated up to secondary and above level. Statistical analyses of the data revealed that educational status was indeed significantly associated with staging of cancer. Similar observations have also been reported by Jain and colleagues among cervical cancer patients in a tertiary care hospital in Mumbai (10). Our findings are also consistent with other studies where illiteracy was documented as a risk factor for cervical cancer (31-33). Lack of education was also associated with early marriage and high parity rates, which are also considered to be independent risk factors for cervical cancer. These observations have clearly emphasized the fact that improvement in literacy level of women in India could serve as an essential tool for cervical cancer control. The most common clinical symptoms associated with onset of cervical cancer in our study was vaginal bleeding which may have been either post coital, or postmenopausal followed by white vaginal discharge along with foul smell. Similar findings have been reported by other studies as well (34-37). This stresses on the fact that there is a need to not only educate women regarding the symptoms of the disease but also coax them to undergo routine clinical examinations possibly at primary healthcare centres. In LMICs such as India, due importance needs to be given to large-scale screening programs to reduce the burden of cervical cancer (38-40). Development and incorporation of mobile health and portable artificial intelligence platforms for population screening including high risk communities could strongly help in ameliorating the problem of low screening rates in India and accelerate early detection (41-43). The combined approach i.e. education, primary prevention (vaccination) and secondary prevention (screening and treatment) needs to be accelerated in order to ameliorate the burden of cervical cancer.

Conclusion

Our study suggests a high proportion of late presenters with evidence that education and diet are associated with stage and clinical prognosis of cervical cancer, thus emphasizing the need for improving awareness and early detection of cervical cancer through accelerated country-wide screening programs with targeting of high-risk populations. Incorporation and implementation of mobile health models and portable artificial intelligence-based platforms for country-wide population-based screening including high-risk populations could help in counteracting late-presentation, improving the overall clinical prognosis and burden of cervical cancer in India.

Recommendation

Our data confirms the expeditious need for cervical cancer awareness and screening incorporating mobile health and artificial intelligence platforms in early detection.

Limitation of the study

Nevertheless, the study is limited by sample size which needs to be considered in future studies. Lack of documentation of certain epidemiological characteristics regarding the reproductive and sexual history of the patients such as age at marriage, age of first sexual intercourse, number of sexual partners, as well as use of oral contraceptive pills are limitations of the study. There was also no documentation on important investigations of HPV infection and vaccination. Thus, we were unable to study a number of associations that could have been useful.

Relevance of the study

This study highlights pertinence of education, lifestyle and diet in initiation, early detection and prognosis of carcinoma cervix.

Authors Contribution

KDS: concepts, design, data collection, manuscript preparation, editing and review. NT: manuscript preparation and editing. AMD: literature search, statistical analysis, manuscript drafting and review. SR: literature search and manuscript editing. PR: manuscript preparation, editing and review. HS: manuscript preparation, editing and review. VKJ: manuscript preparation and review. RJ: concepts, design, manuscript preparation, editing, and review.

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Tables

TABLE 1 STUDY PARTICIPANTS ACCORDING TO SOCIO-DEMOGRAPHIC CHARACTERISTICS (N=136)

Variable	N (%)
Age Mean ± SD, 46 ± 9.8	
20-29	6(4.4)
30-39	29(21.3)
40-49	50(36.8)
50-59	34(25.0)
≥60	17(12.5)
Education	
Illiterate	78(57.4)
Primary & Middle	28(20.6)
Secondary & above	30(22.1)
Place of residence	
Urban	91(66.9)
Rural	45(33.09)
Diet	
Nonveg	27(19.9)
Veg	109(80.1)
BMI Mean ± SD, 23.78 ± 5.03	
<18.5(Underweight)	24(17.6)
18.5-22.9(Normal)	37(27.2)
23-24.9(Overweight)	16(11.8)
25-29.9(Preobese)	42(30.9)
≥30(Obese)	17(12.5)

TABLE 2 DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO CLINIC-PATHOLOGICAL PROFILE (N= 136)

Variable	N (%)
Signs & Symptoms	
White discharge	4(2.9)
Foul smelling discharge	6(4.4)
White discharge & Foul-smelling discharge	28(20.6)
Pain abdomen	30(22.1)
Post coital bleeding	15(11.0)
Post-menopausal bleeding	20(14.7)
Fouls smelling discharge, white discharge and pain abdomen	33(24.3)
Parity	
2	89(65.4)
>2	47(34.6)

Tumour stage	
Stage I	44(32.4)
Stage II	55(40.4)
Stage III	37(27.2)
Stage IV	0
Histology	
SCC	86(63.2)
ADENOCARCINOMA	34(25.0)
ADENOSQUAMOUS	16(11.8)
History of diabetes mellitus	
Yes	32(23.5)
No	104(76.5)
Tumour recurrence	
None	104(76.5)
Pelvic	8(5.9)
Distant	12(8.8)
Pelvic and distant both	12(8.8)
Recurrence of tumour	
None	104(76.5)
Yes	32(23.5)
Treatment complications	
None	106(77.9)
Yes	30(22.1)
Patient prognosis	
Death	36(26.5)
Alive and disease free	100(73.5)

TABLE 3 ASSOCIATION OF SOCIO -DEMOGRAPHIC VARIABLES WITH CERVICAL CANCER STAGING

	Variable	Stage I	Stage II	Stage III	p value
Age	20-39 years	11(31.4%)	14(40.0%)	10(28.6%)	.934
	40- 59 years	28(33.3%)	35(41.7%)	21(25.0%)	
	≥60years	5(29.4%)	6(35.3%)	6(35.3%)	
Education	Illiterate	25(32.1%)	35(44.9%)	18(23.1%)	**.03**
	Primary & Middle	7(25.0%)	7(25.0%)	14(50.0%)	
	Secondary and above	12(40.0%)	13(43.3%)	5(16.7%)	
Diet	Nonveg	2(7.4%)	14(51.9%)	11(40.7%)	**.007**
	Veg	42(38.5%)	41(37.6%)	26(23.9%)	
BMI	Underweight	8(33.3%)	9(37.5%)	7(29.2%)	
	Normal	20(37.7%)	17(32.1%)	16(30.2%)	.474
	Overweight & above	16(27.1%)	29(49.2%)	14(23.7%)	

TABLE 4 ASSOCIATION OF CLINICAL PROFILE WITH CERVICAL CANCER STAGING

	Variable	Stage I	Stage II	Stage III	p value
Parity	2	31(34.8%)	38(42.7%)	20(22.5%)	.231
	>2	13(27.7%)	17(36.2%)	17(36.2%)	
History of diabetes mellitus	No	33(31.7%)	43(41.3%)	28(26.9%)	.925
	Yes	11(34.4%)	12(37.5%)	9(28.1%)	
Recurrence of tumour	None	38(36.5%)	39(37.5%)	27(26.0%)	.166
	Yes	6(18.8%)	16(50.0)	10(31.3%)	
Treatment complications	None	38(35.8%)	40(37.7%)	28(26.4%)	.247
	Yes	6(20.0%)	15(50.0%)	9(30.0%)	
	Patient prognosis				
	Dead	7(19.4%)	18(50.0%)	11(30.6%)	.166
	Alive	37(37.0%)	37(37.0%)	26(26.0%)	