

Epidemiology of cervical cancer: A retrospective study in tertiary health-care center in Kolkata over one decade

Linkon Biswas, Anjan Bera, Debojyoti Manna, Srikrishna Mondal

Department of Radiotherapy, Nil Ratan Sircar Medical College and Hospital, Kolkata, West Bengal, India


Correspondence to: Anjan Bera, E-mail: anjanbera78@gmail.com

Received: August 11, 2019; Accepted: September 13, 2019

ABSTRACT

Background: Globally, cervical cancer is the most common gynecological cancer and the 4th most common malignancy in women with over 526,000 cases diagnosed in 2015 and 239,000 dying of carcinoma cervix every year. Cervical cancer is more common in areas where women have less access to screening, including parts of Asia, Africa, and Central and South America. Cervical cancer is the second most common cancer among women in India and also the second most common cancer among women between 15 and 44 years of age and one of the leading causes of cancer mortality, accounting for 17% of all cancer death among women aged between 30 and 69 years. Nearly, all cases of cervical carcinoma can be attributable to human papillomavirus (HPV), and type 16 and 18 cause 70% of cervical cancer and precancerous cervical lesion worldwide. It is now well-established fact that persistence of HPV infection is a causative factor for cervical neoplasia. Epidemiological data regarding cervical cancer are lacking in India. **Objectives:** The aim of our study was to evaluate the prevalence and epidemiology of cervical cancer in our institution. **Materials and Methods:** Newly diagnosed carcinoma cervix cases registered at Nil Ratan Sircar Medical College, Kolkata, West Bengal, India, between January 2009 and December 2018, were analyzed retrospectively. A total of 4082 cases confirmed by histopathological examination included for analysis. Age, parity, age at marriage, residential area, symptoms, stage, and histological types collected from patient's record file. Staging was done using Federation of Gynecology and Obstetrics staging system. **Results:** About 92% of patients came from rural areas and rest of the patients came from urban areas. Median age of diagnosis is 48 years. Most patients presented in Stage II and Stage III disease (85%). Squamous cell carcinoma found in 85% of patients and most common histology; adenocarcinoma second most common histology (14%). Lymph node metastasis seen in pelvic nodes (48%) followed by para-aortic node (9%) and supraclavicular metastasis in <1% of patients. The most common sites of distant metastasis seen in lung (19%) followed by bone (14%) most commonly to pelvic bone and lumbar vertebra. **Conclusion:** Most carcinoma cervix patients presented in Stages II and III and squamous cell carcinoma is the most common histology seen in 85% of patients. HPV related and molecular risk factors are needed further investigation in future. Multi-institutional and longer period of study may represent population-based data. Awareness of our society regarding needs for screening of asymptomatic patients and HPV vaccination initiative from government is needed for the reduction of incidence and death from cervical cancer.

KEY WORDS: Cervical Cancer; Parity; Squamous Cell Carcinoma; Human Papilloma Virus

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2019.0925914092019	

INTRODUCTION

Globally, cervical cancer is the most common gynecological cancer and the 4th most common malignancy in women with over 526,000 cases diagnosed in 2015 and 239,000 dying of carcinoma cervix every year.^[1] In developed nations, the relative morbidity and mortality of locally advanced

International Journal of Medical Science and Public Health Online 2019. © 2019 Anjan Bera, *et al.* This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

invasive carcinoma have decreased primarily due to adoption of screening programs and treatment of pre-invasive lesion.^[2] However, in the past decade, incidence rates of invasive carcinoma have remained relatively constant due to population growth and aging, and there is marked difference in the incidence of cervical cancer across different region of the world.^[1] In contrast to developed countries, it is a major public health problem in developing countries like India, where women have less access to screening, lack of necessary infrastructure, and so much so that India alone accounts for one-quarter of the worldwide burden of cervical cancer.^[1,3] Cervical cancer is the second most common cancer among women in India and also the second most common cancer among women between 15 and 44 years of age and one of the leading causes of cancer mortality, accounting for 17% of all cancer death among women aged between 30 and 69 years.^[1,3] Nearly, all cases of cervical carcinoma can be attributable to human papillomavirus (HPV), and type 16 and 18 cause 70% of cervical cancer and precancerous cervical lesion worldwide.^[4-6] It is now well-established fact that persistence of HPV infection is a causative factor for cervical neoplasia. In systematic reviews and meta-analyses of literature by ICO HPV Information Centre, HPVs 16 or 18 present in about 82.7% of invasive cervical cancer.^[7] Other epidemiological risk factors for cervical cancer include early age at marriage, multiple sexual partners, multiple pregnancies, poor genital hygiene, malnutrition, use oral contraceptive, and lack of awareness. Early diagnosis and treatment could be initiated by screening, unlike other cancers. In India, there is large burden of cervical carcinoma but effective screening and vaccination not accessible to all part of country; this may be partly because India is culturally and socioeconomically diverse. Epidemiological data regarding cervical cancer are lacking in Eastern India. The aim of our study was to evaluate the prevalence and epidemiology of cervical cancer in our institution.

MATERIALS AND METHODS

Newly diagnosed carcinoma cervix cases registered at Nil Ratan Sircar Medical College, Kolkata, West Bengal, India, in the past 10 years (between January 2009 and December 2018) were analyzed retrospectively. A total of 4082 cases confirmed by histopathological examination included for analysis. Age, parity, age at marriage residential area, symptoms, stage, and histological types collected from patient's record file. Staging was done using FIGO (International Federation of Gynecology and obstetrics) staging system. Complete blood count, urea, creatinine, serum electrolytes, urine analysis, liver function test, sugar (fasting and PP), serology (HbsAg, anti-HCV, HIV1, 2), chest X-ray (posterior-anterior view), computed tomography (CT scan) of abdomen and pelvis, magnetic resonance imaging pelvis, and cystoscopy were done as a part of staging workup along with through clinical examination. Positron emission tomography (CT scan) and bone scan were

done when indicated. Although our study is retrospective in nature and we have collected all epidemiological data from patient's record file in our department only, we have informed formally ethical committee regarding nature the study and stating that no harm, no financial burden would occur to the patients, or patient's further treatment will not alter for our retrospective analysis.

RESULTS

Between 2009 and 2018, a total of 4082 patients were registered in our department and included for analysis. About 92% of patients came from rural areas and rest of the patients came from urban areas. Median age of diagnosis is 48 years [Table 1]. Most patients presented in Stage II and Stage III disease (total 85%, Table 2). Squamous cell carcinoma found in 85% of patients and most common histology; adenocarcinoma second most common histology (14%). Small cell carcinoma, adenosquamous and lymphoma least common histology, found in <1% of patients [Table 3]. Malignant melanoma, adenoid cystic carcinoma, glassy cell carcinoma, adenoma malignum, and basaloid carcinoma were not found. Patients were diagnosed with the following symptoms [Table 4] such as bleeding PV (95%), foul-smelling discharge PV (65%); pelvic, flank, and leg pain (46%); and dysuria (32%). Lymph node metastasis seen in pelvic nodes (48%) followed by para-aortic node (9%) and supraclavicular metastasis in <1% of patients. Most common sites of distant metastasis seen in lung (19%) followed by bone (14%) most commonly to pelvic bone and lumbar vertebra.

DISCUSSION

In our study, 92% of patients came from rural areas and 8% of patients came from urban areas and nearly three-fourth of this study population were presented in advanced stage which is incurable. Median age of diagnosis is 48 years. In this study, squamous cell carcinoma found in 85% of patients and most

Table 1: Disease characteristics and demographic profile

Patients' characteristics	Number of patients (n)
Age	
Median	48 years
Range	33–78 years
Parity (%)	
≤1	490 (12)
≥2	3592 (88)
Age at marriage (%)	
<15 years	2776 (68)
>15 years	1306 (32)
Residential area (%)	
Urban area	327 (8)
Rural area	3755 (92)

Table 2: Stage at diagnosis FIGO (International Federation of Gynecology and obstetrics)

Stage	Number of patients (n) (%)
I	245 (6)
II	1510 (37)
III	1959 (48)
IV	367 (9)

Table 3: Histopathology

Histology	n (%)
Squamous cell carcinoma	3469 (85)
Non-squamous histology	
Adenocarcinoma	571 (14)
Adenosquamous	<1
Small cell carcinoma	<1
Malignant lymphoma	<1

Table 4: Clinical features

Clinical features	%
Bleeding PV	95
Foul-smelling discharge PV	65
Pelvic, flank, or leg pain	46
Dysuria	32
Hematuria	<1
Constipation	<3

common histology, adenocarcinoma second most common histology. Incidence of pelvic lymph node metastasis is 48%.

Cervical cancer is a significant health burden in India despite the availability of effective, affordable screening methods, and HPV vaccine. Due to high prevalence of HPV infection, poor living standard, low socioeconomic condition, and lack of screening, age-adjusted incidence of carcinoma cervix in India is higher than world (19.2/100,000 vs. 7.9/100,000).^[8] Because in rural areas due to cervical cancer cases are underdiagnosed, hysterectomy specimen of subclinical microinvasive cancer cervix not subject to routine histopathological examination, the incidence rates of carcinoma cervix are underestimated.^[9] Although during gynecological examination, cervical cancer most frequently diagnosed in the United States.^[10] Carcinoma cervix patients at the time diagnosed asymptomatic state not seen in our study. As disease progresses with in cervix, bleeding, and ranging from minor spotting to life-threatening hemorrhage, vaginal discharge pain dyspareunia may occur.^[10] Local bulky disease or pelvic adenopathy may cause pressure on lumbosacral nerves or hypogastric plexus, so pain may be referred to lower back or gluteal region. Bladder wall invasion causes dysuria or hematuria. In our study, patients diagnosed with the following symptoms: Bleeding PV (95%), foul-smelling discharge PV (65%); pelvic, flank, and leg pain (46%); and dysuria (32%). These symptoms well

correlated with published literature.^[10] In multiple published literature, squamous cell carcinoma seen in >90% of patients, adenocarcinoma in 10–20%, and endometrioid carcinoma, adenoma malignum, adenoid cystic carcinoma, and small cell carcinoma (<2%) were rare histological types.^[11–13] In our study, squamous cell carcinoma found in 85% of patients and most common histology; adenocarcinoma second most common histology (14%) comparable to incidence reported in above-mentioned literature. In our study, most patients presented in Stage II and Stages III and IV disease (94%) and lymph node metastasis seen in 48% of patients; in these stages, cure rate is less. Because of lack of awareness, inaccessible health care facility in rural areas and organised mass screening programme is not in practice, regional spread of disease is common in most cervical carcinoma cases at the time of diagnosis and only very small portion of patients detected in early stage of disease which is curable.^[14] Immune compromised patients such as HIV infection and organ transplant; patients are increased risk of developing carcinoma cervix due to rapid progression of cervical intraepithelial neoplasia to invasive carcinomas.^[15–18] In our study, only nine patients found to be HIV positive. About 68% of patients married before the age of 15 in our study. Early age at initiation of sexual activity and multiple sexual partners (>5) is associated with increased risk of the development of cancer cervix. Intercourse before the age of 16 has 2-fold increase risk over those who began after the age of 20. This is due to fact that the process of transformation to squamous epithelium from columnar epithelium is active and this columnar epithelium is vulnerable to carcinogenic HPV virus infection.^[19–21] Some may be cofactors with other risk factors increased risk carcinoma cervix, for example, poor socioeconomic status which is related to the pattern of sexual activity, poor genital hygiene, smoking, and limited access to Pap screening.^[22] In India, survival rate of carcinoma cervix showed wide geographic variation ranging 59.6% in Chennai to 34.5% in Bhopal with overall 5-year survival rate 46%. The 5-year survival rates in other Southeast Asia Region country ranging from 61% in Thailand to 79% in South Korea are somehow higher than India.^[23,24] Because nationwide screening program is not available in India, inaccessible health-care facility in rural areas, most cases diagnosed in advanced stage which partly explain lower survival rate.^[25]

However, major limitation of our study is that the results may not be true representative of all carcinoma cervix patients' in the community because our study is retrospective, single-institution study and we have analyzed data of the past 10 years only.

CONCLUSION

Most carcinoma cervix patients came from rural areas, presented in Stages II and III and squamous cell carcinoma is the most common histology which seen in 85% of patients. HPV related and molecular risk factors are needed further investigation in

future. Multi-institutional and study with long follow-up may represent population-based data. Awareness of our society regarding needs for screening of asymptomatic patients and HPV vaccination initiative from government is needed for the reduction of incidence and death from cervical cancer.

REFERENCES

1. Ferlay J, Soerjomataram I, Ervik M, Forman D, Bray F, Dixit R, *et al.* GLOBOCAN 2012, Cancer Incidence and Mortality Worldwide in 2012. Lyon, France: International Agency for Research on Cancer; 2012.
2. WHO. Age-standardized Incidence Rates of Cervical Cancer; 2009. Available from: <http://www.who.int/mediacentre/factsheets/fs297/en>. [Last accessed on 2010 May 22].
3. Institute for Health Metrics and Evaluation. The Challenge Ahead: Progress in Breast and Cervical Cancer. Seattle: Institute of Health Metrics and Evaluation; 2011.
4. Bosch FX, Lorincz A, Muñoz N, Meijer CJ, Shah KV. The causal relation between human papillomavirus and cervical cancer. *J Clin Pathol* 2002;55:244-65.
5. World Health Organization. Human Papillomavirus and Related Cancers; 2010. Available from: http://www.apps.who.int/hpvcentre/statistics/dynamic/ico/country_pdf/XWX.pdf?CFID=5541015. [Last accessed on 2019 Aug 01].
6. Zur Hausen H. Papillomaviruses causing cancer: Evasion from host-cell control in early events in carcinogenesis. *J Natl Cancer Inst* 2000;92:690-8.
7. ICO/IARC. Information Centre on HPV and Cancer. Summary Report 17 June 2019.
8. Sankaranarayanan R, Budukh AM, Rajkumar R. Effective screening programmes for cervical cancer in low and middle-income developing countries. *Bull World Health Organ* 2001;79:954-62.
9. Joshi S, Sankaranarayanan R. Opportunities for cervical cancer prevention in India. *J Krishna Inst Med Sci Univ* 2015;4:8-16.
10. Perez CA, Brady LW, Halperin EC. Principles and Practice of Radiation Oncology. 7th ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2018. p. 5172.
11. Kraus FT, Perezmesa C. Verrucous carcinoma. Clinical and pathologic study of 105 cases involving oral cavity, larynx and genitalia. *Cancer* 1966;19:26-38.
12. Look KY, Brunetto VL, Clarke-Pearson DL, Averette HE, Major FJ, Alvarez RD, *et al.* An analysis of cell type in patients with surgically staged stage IB carcinoma of the cervix: A gynecologic oncology group study. *Gynecol Oncol* 1996;63:304-11.
13. Perez CA, Brady LW, Halperin EC. Principles and Practice of Radiation Oncology. 7th ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2018. p. 5187.
14. Murthy NS, Chaudhry K, Saxena S. Trends in cervical cancer incidence Indian scenario. *Eur J Cancer Prev* 2005;14:513-8.
15. Ferenczy A, Coutlée F, Franco E, Hankins C. Human papillomavirus and HIV coinfection and the risk of neoplasias of the lower genital tract: A review of recent developments. *CMAJ* 2003;169:431-4.
16. Halpert R, Fruchter RG, Sedlis A, Butt K, Boyce JG, Sillman FH, *et al.* Human papillomavirus and lower genital neoplasia in renal transplant patients. *Obstet Gynecol* 1986;68:251-8.
17. Ellerbrock TV, Chiasson MA, Bush TJ, Sun XW, Sawo D, Brudney K, *et al.* Incidence of cervical squamous intraepithelial lesions in HIV-infected women. *JAMA* 2000;283:1031-7.
18. Wright TC Jr., Ellerbrock TV, Chiasson MA, Van Devanter N, Sun XW. Cervical intraepithelial neoplasia in women infected with human immunodeficiency virus: Prevalence, risk factors, and validity of papanicolaou smears. *New York cervical disease study. Obstet Gynecol* 1994;84:591-7.
19. Muñoz N, Bosch FX, de Sanjosé S, Vergara A, del Moral A, Muñoz MT, *et al.* Risk factors for cervical intraepithelial neoplasia grade III/carcinoma *in situ* in Spain and Colombia. *Cancer Epidemiol Biomarkers Prev* 1993;2:423-31.
20. Schiffman MH, Bauer HM, Hoover RN, Glass AG, Cadell DM, Rush BB, *et al.* Epidemiologic evidence showing that human papillomavirus infection causes most cervical intraepithelial neoplasia. *J Natl Cancer Inst* 1993;85:958-64.
21. Chan JK, Monk BJ, Brewer C, Keefe KA, Osann K, McMeekin S, *et al.* HPV infection and number of lifetime sexual partners are strong predictors for 'natural' regression of CIN 2 and 3. *Br J Cancer* 2003;89:1062-6.
22. Becker TM, Wheeler CM, McGough NS, Parmenter CA, Stidley CA, Jamison SF, *et al.* Cigarette smoking and other risk factors for cervical dysplasia in Southwestern hispanic and non-hispanic white women. *Cancer Epidemiol Biomarkers Prev* 1994;3:113-9.
23. Sankaranarayanan R, Swaminathan R, Lucas E. Cancer Survival in Africa, Asia, Caribbean and Central America: Survcan. Lyon: IARC Scientific Publication International Agency for Research on Cancer; 2010.
24. Sankaranarayanan R, Swaminathan R, Brenner H, Chen K, Chia KS, Chen JG, *et al.* Cancer survival in Africa, Asia, and Central America: A population-based study. *Lancet Oncol* 2010;11:165-73.
25. Yeole BB, Kumar AV, Kurkure A, Sunny L. Population-based survival from cancers of breast, cervix and ovary in women in Mumbai, India. *Asian Pac J Cancer Prev* 2004;5:308-15.

How to cite this article: Biswas L, Bera A, Manna D, Mondal S. Epidemiology of cervical cancer: A retrospective study in tertiary health-care center in Kolkata over one decade. *Int J Med Sci Public Health* 2019;8(11):971-974.

Source of Support: Nil, **Conflict of Interest:** None declared.