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In-depth analysis of cervical cancer burden among gynecological malignancies at a tertiary cancer hospital, Hyderabad.

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Abstract---Gynecologic malignancies are a major cause of morbidity and mortality worldwide. Understanding the most recent worldwide patterns and temporal changes in cervical cancer burden could help to prevent and control the disease. The goal of this retrospective study was to estimate the prevalence of cervical cancer among gynecological malignancies diagnosed at the Basavatarakam Indo-American Cancer Hospital & Research Institute (BIACH&RI) Hyderabad, Telangana, India, between January 2017 and December 2021. This study received permission from the BIACH&RI's ethical committee. The information was manually obtained from clinical records based on each patient's MR numbers and the results were analyzed using a statistical package available from IBM SPSS version 26. During the study period of 5 years, a total of 94133 cases of various cancers were documented at BIACH&RI, among which 5524 were gynecological malignancies. The cervix was the most common site with 56%, followed by the ovary (26%) and endometrial (11.5%). Vulva and vaginal tumors were less frequent. According to this study cervical cancers occurred between 20-90 years with 61 percent of cases occurring in women aged 41 to 60. The majority of cases (76%) were discovered in low-income households, with only around a quarter of cases reported in middle and high-income households. More than 80% of all cancers were discovered to be in an advanced stage, with 38% in stage II and 46% in stage III. Patients in stage IV accounted for nearly 10% of all cases. A tiny fraction of cases, about 6%, were presented early in the process, such as stage I.

It is concluded from the present research that cervical cancer is the most common cancer of gynecological cancers, owing to the high prevalence of HPV. The compounding factors include illiteracy, poor to moderate living standards, early marriage, lack of sanitation, and improper sexual activity which were observed mostly in the low-income category in this analysis, accounting for 76 % of the cases. More than 80% of all cancers were found to be in advanced stage due to a lack of awareness and structured and effective screening programs in rural areas. Since it has been proved that HPV infection is the aetiology of carcinoma cervix, we need to educate the public on the importance of HPV vaccination and the importance of early detection, diagnosis, and treatment.

Keywords: Cervical cancer, prevalence, socioeconomic groups, stage of presentation

Introduction

Gynecological cancers are a severe threat to women's health. Incidence, stage of presentation, and death vary greatly across the country. The group of gynecological cancers includes cancers of the cervix, uterus, ovary, vaginal canal, and vulva. Endometrial and ovarian cancers are the most

prevalent gynecological cancers in high-income countries, whereas cervical cancer is more common in low-to-middle-income countries and is the main cause of gynecological cancer fatalities globally. Cervical cancer is the fourth most frequent cancer in women worldwide, with 604 000 new cases and 342 000 deaths predicted in 2020. In 2020, low- and middle-income nations(LMICs) will account for over 90% of new cases and deaths worldwide. (1) Low- and middle-income countries have a substantially heavier incidence than high-income countries. This disparity is a direct effect of low socioeconomic status, illiteracy, unavailability of facilities, early marriages, and unaware hygienic practices. Developed countries have established immunization and screening programs that have reduced the prevalence of cervical cancer. However, because of the lack of resources and infrastructure in developing countries, such prevention and treatment initiatives are limited or non-existent. High HPV vaccination coverage for girls can lead to cervical cancer elimination in most LMICs by the end of the century. Screening with high uptake will expedite reductions and will be necessary to eliminate cervical cancer in countries with the highest-burden. (2) The relative risk of cervical cancer is increased in current users of oral contraceptives and declines after use ceases. (3) Cervical cancer is the most frequent malignancy, according to studies from India and Bangladesh. (4, 5)

According to Globocan 2020, cervical cancer accounted for 9.4% of all malignancies and 18.3 percent (123,907) of new cases in India in 2020. Despite the fact that the age-standardized incidence rate of cervical cancer declined by 39.7% (95 % UI 26.5–57.3) between 1990 and 2016, it is still the second largest cause of cancer mortality among females in 12 Indian states. (6)

It is one of the most common causes of cancer death, accounting for 17% of all cancer deaths among women aged 30 to 69 years. Cervical cancer is projected to affect 1 in every 53 Indian women during their lifetime, compared to 1 in every 100 women in more developed countries of the world. (7)

To estimate the disease burden, a high-quality cancer registry and population-based data are required. It will aid in the development of proper evidence-based control programs for nations where the disease is most prevalent. Carcinoma cervix is curable if diagnosed early. Cervical cancer, unlike other cancer locations, can be screened for early detection and treatment by performing a simple VIAA test & PAP smear test. Despite the availability of many cervical cancer screening methods and the high prevalence of the disease in India, there is no countrywide government-sponsored public health policy on cervical cancer prevention by screening, vaccine, or both. As a result, this research was done to better understand the current burden of cervical cancer in a region of India, as well as to evaluate the various cervical cancer screening methods and studies that have been conducted to evaluate screening tests for the diagnosis of cervical carcinoma.

This study was designed to collect local data on the age group, socioeconomic status, marital status, parity, symptoms, stage of presentation, therapy, recurrence, addictions, and family history of cervical cancer patients who presented to a tertiary care hospital. It will aid in educating the people, developing strategies for early detection, and timely treatment, and prioritizing cancer prevention activities. This is the first five-year evaluation of cervical cancer data from BIACH&RI in Hyderabad, Telangana, India. The goal of this study was to determine the prevalence of cervical cancer in various age groups and socioeconomic categories, as well as the stage of presentation, the impact of addictions, and the impact of family history on cervical cancer in a tertiary cancer hospital.

Materials and Methods

This research was carried out at Basavatarakam Indo-American Cancer Hospital & Research Institute (BIACH&RI) in Hyderabad, Telangana, India, from January 1, 2017, to December 31, 2021. The ethical review committee of the BIACH&RI issued approval for this research – (ECR/7/Inst/AP/2013/RR-20).

A total of 5524 gynecological cancer cases were gathered over this time period, out of 94133 total malignancy cases got registered in the center. From the 5524 gynecological malignancy patients, 3118 cervical cancer cases were analyzed in depth. All the patients' clinical records are filed in the Medical Record section. It is the hospital policy to take consent from the patients at the time of registration itself. However, the identity of the patients is not revealed in our study. Data analysis was done using the hospital MR numbers only. The data was entered on a predesigned pro forma once the record was assessed. The data was carefully evaluated, and simple frequencies and percentages were calculated.

Sampling technique

Only gynecological malignancies (cervix, endometrium, ovary, vagina, and vulva) were chosen from the total number of cancer cases. Women with breast or extra-genital tract tumors were not allowed to participate. Cervical malignancies were chosen as the focus of several of the cases.

The study tools

Data was manually acquired by observing clinical records based on each patient's MR numbers and immediately placed into a spreadsheet. Age, primary site, socioeconomic status, stage of presentation, marital status, parity, symptoms, treatment, recurrence, metastasis in several locations, menopausal age, addictions, and family history are all listed on the pro forma.

Statistical analysis

IBM SPSS version 26 was used to analyze the data. Frequency, percentage, mean, standard deviation, and range were used to display the data (minimum and maximum values).

Results

Between January 1, 2017, and December 31, 2021, a total of 94113 patients with various malignancies were registered at Basavatarakam Indo-American Cancer Hospital & Research Institute in Hyderabad, India. The number of gynecological malignancies is 5524, with a frequency of (5.9 %).

Table 1 shows the annual distribution of gynecological malignancies by the site. The most frequent gynecological malignancy was cervical cancer, which was seen in 3118 instances (56.5%), followed

by ovarian cancer in 1433 cases (26%), endometrial cancer in 636 cases (11.5%), vaginal cancer in 267 cases (4.8%), and vulva cancer in 70 cases (1.2 %).

Table 1
Annual distribution of gynecological malignancies by site

Site	2017	2018	2019	2020	2021	Total	%
Cervix	792	703	659	455	509	3118	56.4%
Endometrium	124	140	117	104	151	636	11.5%
Ovary	318	294	301	254	266	1433	25.9%
Vagina	45	61	71	59	31	267	4.8%
Vulva	12	23	18	7	10	70	1.3%
Total	1291	1221	1166	879	967	5524	100%

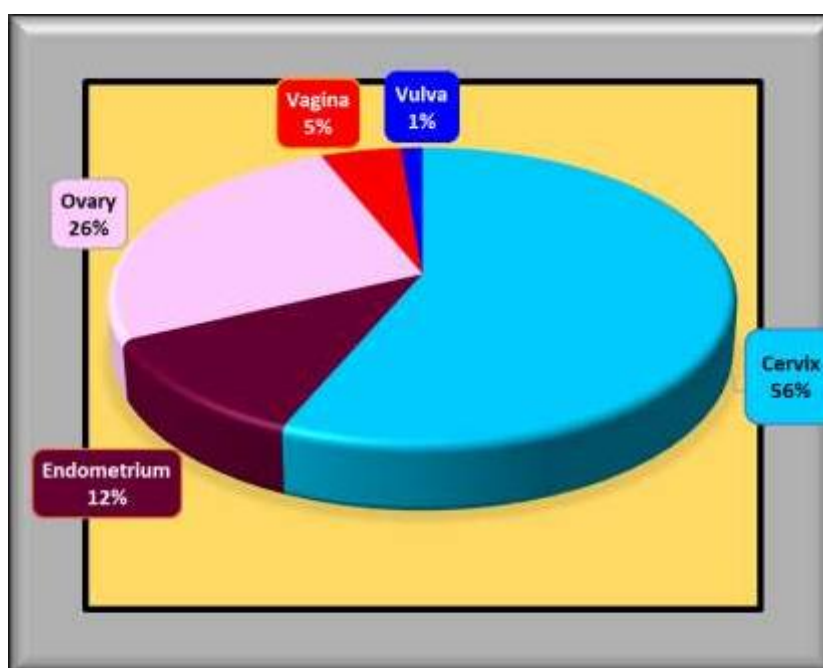


Figure 1. Represented percentage of gynecological malignancies by site

According to the current study, cervical cancer affects 56 percent of women shown in figure (1). The age-wise distribution of cervical cancer in the study population is shown in Table 2. Cervical cancers became more common as women became older, with 61 percent of cases occurring in women aged 41 to 60. Cervical malignancies were most commonly diagnosed after the age of 30, with a peak frequency in the fifties. Only 0.7 percent of instances were seen in the 20s, then increased to a peak in the fifties, then declined until the age of 90. One person was diagnosed with cervical cancer when she was 21 years old. At the age of 90, two cases were discovered. The mean age of cervical cancer in this study is 53.3 ± 2.65 .

Table 2

Age-wise distribution of cervical cancer in the study population

Age	No. of Cases	%
21-30	23	0.74%
31-40	335	10.74%
41-50	939	30.12%
51-60	958	30.72%
61-70	604	19.37%
71-80	231	7.41%
81-90	28	0.90%
Total	3118	100%
Mean ± SD		(Min - Max)
53.3 ± 2.65		(21-90)

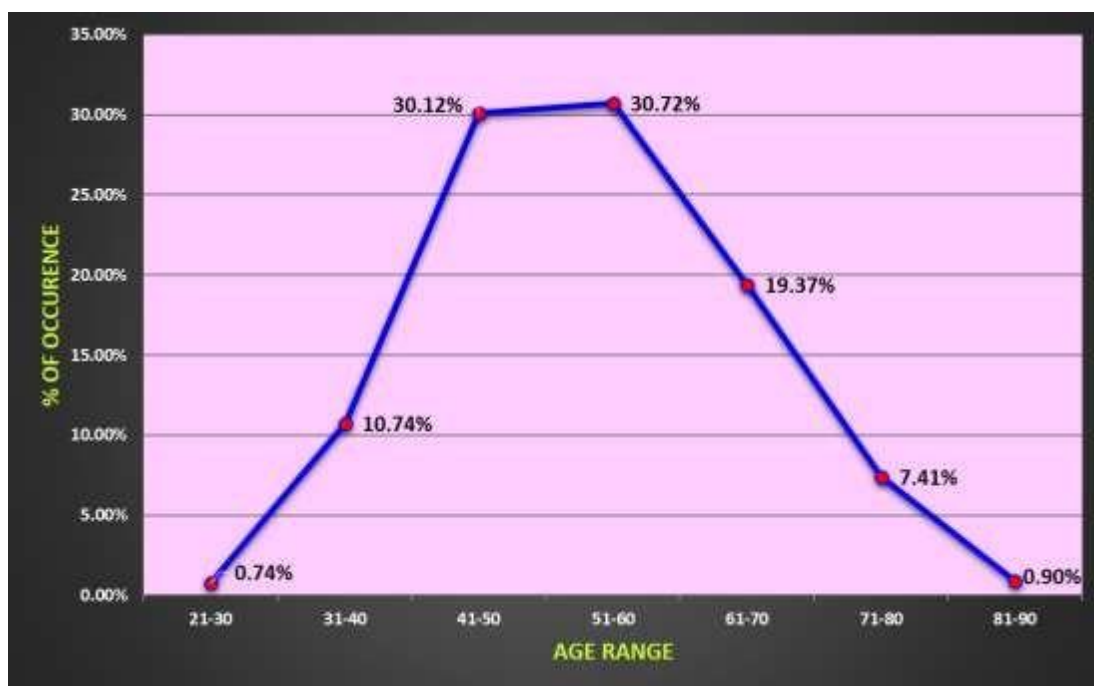


Figure 2. Shows the cervical cancer percentage in different age groups

Cervical cancers began in the 20s, peaked in the 40s and 50s, and then fell until the age of 90, according to the current study shown in figure (2).

Table 3 indicates the prevalence of cervical cancer in different socioeconomic groups, such as low-income group labor (LIGL), low-income group non-labor (LIGNL), and middle and high-income group (MAHIG). The majority of instances (76%) were found in the low-income group, with 66 percent in LIGL and 10% in LIGNL. Only about a quarter of the instances are seen in MAHIG.

Table 3

Prevalence of cervical cancer in different socioeconomic groups

Socioeconomic Group	No.of Cases	%
LIGNL	311	9.97%
LIGL	2055	65.91%
MAHIG	752	24.12%
TOTAL	3118	100.00%

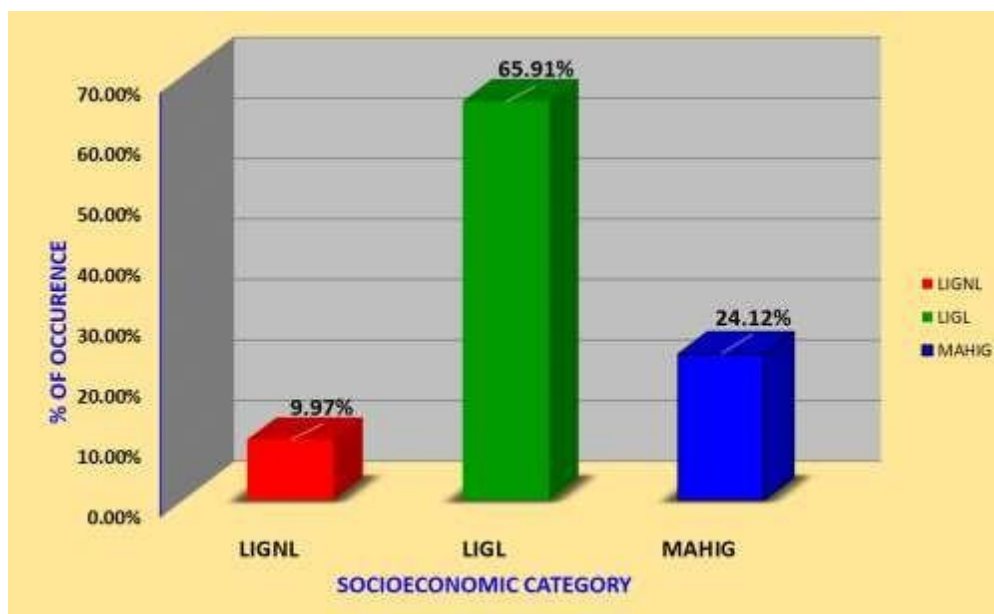


Figure 3. Represented cervical cancer percentage in different socioeconomic groups

Cervical cancer is more common in low-income groups, according to the findings of this study as shown in figure (3).

Table 4 shows the presentation of illness stages. More than 80% of all malignancies were found to be at an advanced stage, with 38% in stage II and 46% in stage III. Stage IV patients accounted for nearly 10% of all cases. A small percentage of cases, about 6%, were presented at an early stage, such as stage I.

Table 4

Cervical cancer stage of presentation

Stage	No. of Cases	%
I	170	5.46%
II	1189	38.13%
III	1439	46.15%
IV	320	10.26%
TOT	3118	100%

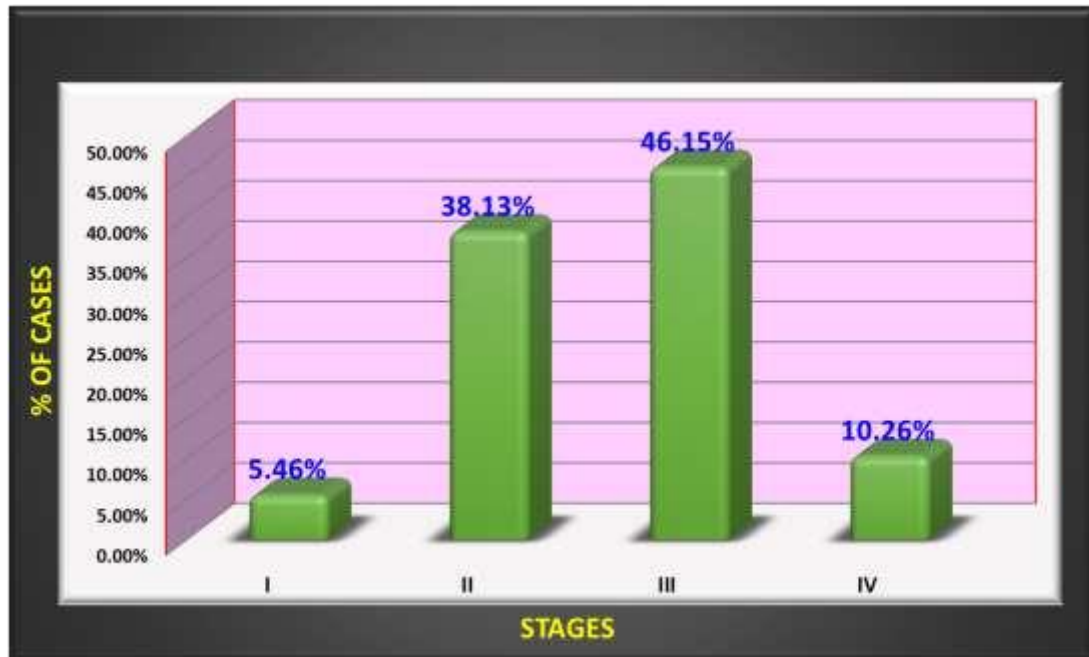


Figure 4. Represented the percentage of cervical cancer cases presented at different stages

The majority of cases were presented at stage II or III, according to the findings of the current study as shown in figure (4).

Around 7% of cervical cancer patients have diabetes, 11% have hypertension, and 2% have hypothyroidism. Menopause is reached by 56 percent of women between the ages of 41 and 50, and 23 percent of women between the ages of 51 and 60.

There are 323 nulliparous members among the 3118 cases and ten single members.

In 1047 instances, postmenopausal bleeding is the most prevalent symptom, accounting for approximately 34% of all cases. Irregular per vaginal bleeding is the most common complaint, accounting for 22% of all cases. White discharge is a symptom in approximately 35% of 1092 members.

In 318 cases, cancer has progressed to other parts of the genital tract, and metastases have been found in the liver, bones, brain, lungs, and lymph nodes. After cytoreduction or chemotherapy, recurrence of illness was observed in roughly 150 instances. In these 150 cases, nearly half of the patients default at some point during the treatment and didn't complete the schedule. A total of ten hospital deaths have been reported all of them due to the progress of the disease.

Only 40 of the instances (1.3%) had a family history, indicating that this disease is not familial in nature.

Some addictions, such as smoking, tobacco chewing, alcohol drinking, gutka, zarda, and others, are only detected in 25 cases (1%), which is not statistically significant.

Discussion

Cervical cancer is a public health problem in India to date, despite the availability of HPV vaccinations and economical and effective technologies for early detection and treatment of cervical cancer precursor lesions. Because of poor to moderate living standards, a high incidence of HPV,

and a lack of screening, India and Southeast Asian countries have a high incidence of cervical cancer. (8) The peak age of occurrence of cervical cancer in India is between 55 and 59 years, and the highest age-adjusted rates are in Aizawl in the northeastern part of India at 24.3 per 100,000 women. (9) The incidence rates reported by individual Population-Based Cancer Registries vary widely (range: 4.91–23.07/100,000). (10)

In this study, cervical malignancies accounted for more than 56% of all malignant tumors in the female genital tract. These findings are similar to those of a study conducted at the University of Ilorin Teaching Hospital in Nigeria (Ibrahim HM, Ijaiya MA.2013), (11) which found that cervical cancer was the most common in 59.6 percent of cases, as well as a study conducted at the Gynaecology Department of OOUTH, Sagamu, Nigeria (Adefuye PO et al., 2014), (12) which found that 51.6 percent of cases had cervical cancer. In addition, a study conducted in the Department of Obstetrics and Gynecology Unit-II at Liaquat University of Medical and Health Sciences in Jamshoro (Khursheed F et al., 2010) (13) revealed that 60.28 percent of cervical cancer cases.

Parveen N et al., 2018 (14) in the Department of Obstetrics and Gynecology, Liaquat University of Medical and Health Sciences, Jamshoro, with 41.5 percent cases, and Yakasai IA et al., 2013 (15) in the Gynaecology Department of Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria, with 48.6 percent cases, both show lower percentages. However, Ugwu EO et al., 2011 (16) at the University of Nigeria Teaching Hospital in Enugu, south-eastern Nigeria, found 78 percent, and Tanko MN et al., 2012 (17) at the University of Botswana and the National Health Laboratory in Gaborone, Botswana, found 80.6 percent, which is very high percentages. According to Shalini Rajaram et al., 2014 (18), a total of 1315 gynecological malignancies were recorded in a tertiary care center in India, with cancer cervix being the most prevalent (70.4 percent) with a steady increase in the number from 56 in 2000 to 157 in 2009. These findings suggest that the prevalence of cervical cancer is affected by a variety of factors such as lifestyle, socioeconomic level, and public awareness.

In certain countries, cancer ovary may be the most common malignancy. Wasim T et al., 2021, (19) found 49.18 percent ovarian cancer, followed by 23.7 percent cervical cancer in a tertiary care hospital in Pakistan, and Manzoor H et al., 2017, (20) at the Centre for Nuclear Medicine and Radiotherapy (CENAR), the south western region of Pakistan, found 47 percent ovarian cancer, followed by 29 percent cervical cancer. The ovary was the most prevalent site, followed by the cervix, according to Bibi S et al., 2016, (21) at the nuclear institute of medicine and radiation Jamshoro Sindh.

Surprisingly, both cervical and ovarian cancers had the same number of instances in one site, the Teaching Hospital in Batticaloa, Sri Lanka, where roughly 143 genital tract cancers were detected. Thirukumar M, Sinnathurai A. 2021 (22) found 52 cervical cancers (36.36 percent) and 52 ovarian malignancies (36.36 percent).

Cervical cancer has a low incidence and fatality rate in wealthy countries like the United States. (23)

The majority of cases of cervical cancer were discovered in low-income categories, with 66 percent in LIGL and 10 percent in LIGNL. Roughly a quarter of the cases are found in MAHIG. These findings matched those of a study conducted by Parveen N et al., 2018 (14) at Liaquat University of Medical

and Health Sciences, Jamshoro, in the Department of Obstetrics and Gynecology. Seventy-one percent of the participants were from low-income households.

But Cervical cancer is the most frequent malignancy among women in underdeveloped countries, according to various research. The absence of structured and effective screening programs has been blamed for the high prevalence of cervical cancer in Sub-Saharan Africa. Furthermore, the HIV pandemic has had a key role in the increased prevalence of cervical cancer. Cervical cancer risk is substantially impacted by sexual activity, according to epidemiological studies. (24,25,26)

Despite the fact that there is no proof that HIV causes cervical neoplasia directly, the risk of developing a cervical intraepithelial lesion is at least two to five times higher in HIV-positive women than in HIV-negative women.

Numerous studies have found that more than 90% of cervical cancer cells have high-risk human papillomavirus (HPV) DNA. (27) This implies that HPV infection is a direct cause of cervical cancer.

Cervical cancer is a disease that displays disparities among communities based on the availability of a national vaccination program, population-based cervical cancer screening, and effective treatment. Dr. Tedros Ghebreyesus, the Director-General of the World Health Organization (WHO), advocated for action to end cervical cancer as a public health issue in May 2018. The WHO's Executive Board asked the Director-General to "create, in conjunction with the Member States and other relevant stakeholders, a draught global strategy to accelerate cervical cancer elimination, with specific goals and targets for the period 2020–2030," in January 2019. Those nations will make significant gains in the near future in terms of cases averted and lives saved from invasive cervical cancer if they follow the strategic actions recommended by the draught global strategy for eliminating cervical cancer—by immunizing at least 90% of girls by the age of 15, screening at least twice in a lifetime for 70% or more of the target age groups, and treating more than 90% of women with screen-detected lesions. (28)

In India, efforts are being made to increase the coverage of human papillomavirus (HPV) vaccination among adolescent girls. In 2008, the nation approved bivalent and quadrivalent HPV vaccines, as well as a nonavalent vaccine in 2018. In 2009, demonstration projects in Andhra Pradesh and Gujarat brought HPV vaccination into India's public health systems. HPV vaccination in research projects was halted after a few deaths in these studies, which were later determined to be unrelated to vaccination. As a result of the suspension by default, some participants in a trial comparing two against three doses only received one dosage. Since 2016, the successful introduction of HPV vaccination in immunization programs in Punjab and Sikkim (with high coverage and safety), government-sponsored opportunistic vaccination in Delhi, the prospect of a single dose providing protection, and the future availability of an affordable Indian vaccine have all raised hopes for the widespread implementation and evaluation of HPV vaccination in India. (29)

Incorporating HPV vaccination into a state-run, extended immunization program aimed at adolescent girls in schools, health-care facilities, and community settings has the potential to save many lives in resource-constrained areas. (30)

Cervical cancer is most common in individuals in their fifties, according to the findings of this study. Sixty-one percent of these malignancies struck people in their forties and fifties. The mean age of cervical cancer in this study is 53.3 ± 2.65 . These findings are consistent with those of Wasim T, et

al., 2021 (19) at a tertiary care hospital in Pakistan, who found that the mean age of cervical cancer was 43 ± 8.9 years, Thirukumar M, Sinnathurai A. 2021 (22) at the Teaching Hospital, Batticaloa, Sri Lanka, who found that cervical malignancies peaked at 40-59 years and The mean age was 51 years, according to Aziz N, et al., 2013 (31) at Pakistan's Nuclear Institute of Medicine and Radiotherapy (NIMRA).

Heavy menstrual bleeding and postmenopausal bleeding were observed in 56% of the individuals in this study. Similar symptoms were observed in the study of Wasim T et al., 2021 (19) at a tertiary care hospital in Pakistan.

More than 80% of all cancers were found to be at an advanced stage, with 38% in stage II and 46% in stage III, according to the current study. Nearly 10% of all cases were stage IV. Only around 6% of the cases were presented at an early stage, such as stage I. These findings are consistent with those of Aziz N, et al., 2013 (31) at Pakistan's Nuclear Institute of Medicine and Radiotherapy (NIMRA), which found that only 8 (14.28%) cases were in Stage I, whereas 20 (35.71%), 22 (39.28%) were in stage II and stage III respectively and 6 (10.71%) cases were in advanced stage IV.

The disease has spread to other regions of the genital tract in 318 cases, with metastasis discovered in the liver, bones, brain, lungs, and lymph nodes. Ninety percent of these were discovered at an advanced stage. In about 150 cases, recurrence of illness was found after cytoreduction or chemotherapy. In these 150 cases, nearly half of the patients defaulted at some time throughout therapy.

There is a strong link between early cancer detection and higher survival and cure rates. When cancer spreads, therapy becomes complicated and expensive, and survival chances are slim. Unfortunately, the findings are highly discouraging, as 60% of the cancers showed at an advanced stage. The problem is multi-factorial and complex, owing to socio-economic and cultural background, as well as a lack of inexpensive and standardized cancer care in comparison to other developed countries. (32, 33)

The condition is exacerbated by illiteracy, poverty, and a lack of awareness. In resource-poor nations, a major roadblock in the fight against cancer is a lack of awareness of the benefits of screening, early diagnosis, and treatment.

With limited resources and budgetary constraints in India, public awareness campaigns are a low-cost method worth pursuing. To highlight the importance of early detection and treatment, mass media such as newspapers, television, FM radio, and mobile phone messages can be used. Health-care providers preferably women are welcome to join the team. It will assist women, their families, and the community in overcoming cancer myths, misconceptions, and fear. The most cost-effective screening approach for preventing cervical cancer in resource-poor nations is one that involves fewer visits for testing, treatment, and follow-up. On the same visit, a comprehensive strategy of simultaneous VIA or VILI screening and cryotherapy treatment of pre-cancerous lesions are particularly beneficial. (34) In BIACH&RI, they are conducting regular screening camps in the villages and small towns and creating awareness of the healthy practices among the public through medical education programs.

Conclusions

As we are aware cervix was shown to be the most common location for gynecological cancers which is clearly evidenced in this study. Cervical cancer affects 61 percent of women in their forties and fifties.

This study also indicated that 76 percent of cervical malignancies were identified in the low-income group, with 66 percent in the low-income daily labors. More than 80% of all cases were discovered to be in advanced stages. As HPV is proved to be the main causative factor of the disease, HPV vaccination has to be made mandatory like other vaccinations for adolescent girls. Since carcinoma cervix is preventable cancer educating the public is the most important step in the prevention of cancer. The females should not be deterred from coming to the hospitals in case of any small complaints like white discharge and bleeding. Robust awareness and screening programs will guide the females to come for health check-ups.

Recommendations

Unlike other cancer sites, the cervix can be checked for early identification and treatment, which can save a lot of lives. It is of utmost importance in India to implement the HPV vaccination program focused on adolescent girls must be stressed in schools, healthcare facilities, and community settings. By 2030, India is expected to have met the WHO's 90-70-90 guidelines, putting it on pace to eliminate cervical cancer within the next century.

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