Current Perspectives on Cervical Cancer Screening: Knowledge, Accessibility, And Preventive Strategies

Piyush Solanki[1], Divya Prajapati[2], Neelima Goswami[3], R. B. Goswami[4]
[1,2,3,4]*Sagar Institute of Research Technology & Science-Pharmacy, Bhopal*

Abstract—**Cervical Cancer remains one of the biggest health concerns affecting women worldwide. It is the fourth most common cancer among women globally, with about 570,000 new cases and 311,000 deaths reported in 2018. Most of these cases occur in developing countries, where access to healthcare services and awareness programs may be limited. This study was carried out to understand the socio-demographic factors that influence cervical cancer screening, assess women's knowledge about cervical cancer, and examine how accessible screening services are to women. The research used a cross-sectional descriptive survey design and was conducted among women attending the gynecology ward, antenatal clinic, and family planning clinic at Embu Teaching and Referral Hospital. A total of 60 women of reproductive age participated in the study through self-administered questionnaires.**

The collected data was analyzed using Microsoft Excel, and the results were presented using descriptive statistics and tables. Findings showed that all participants had heard about cervical cancer screening. However, despite this high level of awareness, detailed knowledge about the signs, symptoms, and prevention of cervical cancer was still low. Only 33% of the women knew the warning signs, while 27% understood preventive measures. In addition, only 33.3% of the participants had actually utilized cervical cancer screening services.

The study also found that socio-demographic factors influenced women's participation in screening programs, even though screening services were generally available and accessible. Based on these findings, the study concluded that awareness alone is not enough to improve screening uptake. More community education and sensitization programs are needed to encourage women to undergo regular cervical cancer screening. The Ministry of Health should continue promoting early screening and organize health education campaigns to provide accurate information and reduce misconceptions about cervical cancer screening services.

I. INTRODUCTION

Cervical cancer is a major global health problem and is the fourth most common cancer among women worldwide. According to the World Health Organization (WHO, 2018), approximately 570,000 new cases and 311,000 deaths were reported globally in 2018. The highest incidence and mortality rates are found in Africa, where the rates are seven to ten times higher than those reported in North America, Australia, New Zealand, and Western Asia. About 86% of cervical cancer deaths occur in low-income countries within sub-Saharan Africa. In addition, nearly 70% of the global burden occurs in less developed regions, and more than one-fifth of new cases are diagnosed in India (WHO, 2013).

Cervical cancer is considered a preventable disease; however, it remains one of the leading causes of cancer-related deaths among women in low- and middle-income countries. Many women die during their most productive years of life (WHO, 2013). Although various technologies and preventive measures are available, these services remain inaccessible to many women who need them most. Despite the strong relationship between Human Papillomavirus (HPV) infection and cervical cancer, HPV vaccines are not widely available in many developing countries, and screening rates remain low. Lack of awareness and social stigma related to the disease further limit women from seeking screening and treatment services (WHO, 2013).

Cervical cancer is a malignant condition of the cervix in which abnormal cells grow uncontrollably and form tumors (Kumar et al., 2007). In advanced stages, the disease is associated with high morbidity and mortality, and the prognosis becomes poor. Therefore, early diagnosis and treatment of precancerous lesions are essential in reducing deaths and complications

associated with cervical cancer (Kumar et al., 2007).
Studies conducted in the United States and Sweden have shown that regular cervical cancer screening and follow-up of abnormal findings significantly reduce the incidence, morbidity, and mortality associated with cervical cancer (Saslow, Boates & Burke, 2008; Bergestrom et al., 1999). The American Cancer Society recommends that every sexually active woman, or women aged 21 years and above, should undergo annual cervical cancer screening for the first three consecutive years (Saslow, Boates & Burke, 2008).
In low-income countries, cervical cancer remains one of the most common cancers among women, accounting for over three-quarters of the estimated half a million new cases diagnosed annually. The highest incidence rates are reported in developing countries, particularly in sub-Saharan Africa (GLOBOCAN, 2013; Stat Bite, 2006). This high prevalence is mainly attributed to poor access to screening services, inadequate screening programs, and low awareness about the disease in developing nations (Stat Bite, 2006; Gatune & Nyamongo, 2005).
A study conducted at the former Central Provincial General Hospital in Nyeri, Kenya, revealed that the utilization of cervical cancer screening services was low at 24.7%, despite the participants
being relatively educated and capable of making independent health decisions. Less than 20% of the women understood the importance of cervical cancer screening, while 80% could only mention one or two risk factors associated with the disease (Gichogo, 2012). Since cervical cancer develops slowly over a period of 10–12 years, regular screening is essential for early detection and prevention. Therefore, women should be educated about the available screening services, risk factors, preventive measures, and treatment options for precancerous conditions.

II. EPIDEMIOLOGY OF CERVICAL CANCER

1. Global Incidence and Mortality

Cervical cancer is one of the most common cancers in women worldwide. It is the fourth most common cancer among women and the seventh most common cancer overall. Every year, more than 500,000 women are diagnosed with cervical cancer, and around 250,000–324,000 women die from the disease.
The burden of cervical cancer is much higher in low- and middle-income countries (LMICs). About 85–90% of cervical cancer deaths occur in these countries because of poor access to healthcare, lack of awareness, and limited screening facilities.
The highest number of cases are seen in sub-Saharan Africa, Southeast Asia, Latin America, and parts of Central and Eastern Europe. In contrast, developed countries such as the United States, Canada, Australia, and Western Europe have lower rates because of regular screening programs and HPV vaccination.

2. Etiology: Role of HPV

The main cause of cervical cancer is persistent infection with high-risk types of Human Papillomavirus (HPV). More than 99% of cervical cancer cases are linked to HPV infection.
There are more than 130 types of HPV, but only some are cancer-causing. HPV-16 and HPV-18 are the most dangerous types and are responsible for about 70–75% of cervical cancer cases worldwide.
HPV infection is most common in sexually active young women under 25 years of age. However, cervical cancer usually develops many years later because the disease progresses slowly. Most cases are diagnosed in women between 40 and 60 years of age.

3. Co-factors and Behavioral Risk Factors

Although HPV infection is necessary for cervical cancer, not all HPV infections lead to cancer. Many infections disappear naturally within two years. Certain factors increase the risk of progression to cancer:

1. Sexual Behavior
2. Early age at first sexual intercourse
3. Multiple sexual partners
4. Having a partner with high-risk sexual behavior
5. These factors increase the chance of HPV transmission.
6. Tobacco Smoking

Smoking increases the risk of cervical cancer, especially squamous cell carcinoma. Chemicals in cigarettes weaken the immune system and help HPV infection persist for a longer time.

Immunosuppression (HIV)
Women with weak immune systems, especially those living with HIV, are more likely to develop persistent HPV infection and precancerous lesions. Other Risk Factors

1. Multiple pregnancies (high parity)

2. Long-term use of oral contraceptives
3. Malnutrition
4. Poor genital hygiene

These factors also contribute to the development of cervical cancer.

4. Histopathology

Cervical cancer mainly occurs in two forms:

Squamous Cell Carcinoma

This is the most common type of cervical cancer and accounts for the majority of cases worldwide. It begins in the squamous cells of the cervix.

Adenocarcinoma

This type develops from glandular cells of the cervix. It is less common but has been increasing in some developed countries.

5. Prevention and Elimination of Cervical Cancer

Primary Prevention: HPV Vaccination

HPV vaccines have been available since 2006. These vaccines protect against high-risk HPV types, especially HPV-16 and HPV-18. Vaccination is most effective when given before sexual activity begins.

Secondary Prevention: Screening

Regular screening helps detect precancerous changes early. Common screening methods include:

1. Pap smear test
2. Liquid-based cytology
3. HPV DNA testing

III. DIAGNOSTIC AND SCREENING

Cervical cancer screening is an important preventive healthcare practice used to detect abnormal changes in the cervix before they develop into cancer. Early detection helps doctors provide timely treatment and greatly reduces the risk of developing cervical cancer. Regular screening has been proven to save lives because cervical cancer usually develops slowly over many years.

Purpose of Cervical Cancer Screening

The main goals of screening are

To identify precancerous changes in cervical cells.

To detect cervical cancer at an early stage when treatment is most effective. To reduce the number of cervical cancer cases and related deaths.

To improve women's overall reproductive health and awareness.

Primary Screening Tests

1. Human Papillomavirus (HPV) Test

The HPV test checks for high-risk types of Human Papillomavirus, which is the major cause of most cervical cancer cases. During the test, a small sample of cells is collected from the cervix and examined in a laboratory. Detecting HPV early helps identify women who may be at higher risk of developing cervical cancer.

2. Pap Smear (Papanicolaou Test)

A Pap smear is a simple and commonly used screening test. In this procedure, a healthcare professional gently collects cells from the cervix using a small brush or spatula. These cells are then examined under a microscope to look for abnormal or precancerous changes.

3. Co-testing

Co-testing combines both the HPV test and the Pap smear at the same time. This method provides more accurate results because it checks for both HPV infection and abnormal cervical cells together.

General Screening Guidelines

Screening recommendations vary depending on a woman's age, medical history, and risk factors. Ages 21–29 Years

Women are generally advised to undergo a Pap smear every 3 years.

HPV testing is usually not done routinely in this age group unless Pap smear results are abnormal.

Ages 30–65 Years

Women in this age group may choose one of the following:

Primary HPV testing every 5 years.

Co-testing (HPV + Pap smear) every 5 years. Pap smear alone every 3 years.

Over 65 Years

Screening may be stopped if:

Previous screening results have been consistently normal.

There is no history of serious cervical abnormalities or high-risk conditions. Importance of Early Detection

Early detection of cervical abnormalities can prevent cancer from developing. Most precancerous changes can be treated successfully before they become dangerous. Regular screening also helps reduce treatment costs and improves survival rates

Diagnosis of Cervical Cancer

If screening results are abnormal or if symptoms such as unusual vaginal bleeding, pelvic pain, pain during intercourse, or abnormal vaginal discharge are present, further tests are needed to confirm the diagnosis. Additional Diagnostic Procedures

Colposcopy

A colposcopy is a procedure in which the doctor uses a special instrument called a colposcope to closely examine the cervix for abnormal areas.

Biopsy

During a biopsy, a small tissue sample is taken from the cervix and examined in the laboratory to determine whether cancer or precancerous cells are present.

Imaging Tests

In confirmed cases of cervical cancer, imaging tests such as ultrasound, CT scan, MRI, or PET scan may be used to determine the stage and spread of cancer.

IV. METHOD AND MATERIAL

A cross-sectional study was conducted to assess the level of knowledge and awareness regarding cervical cancer and screening for precancerous cervical lesions among women aged 20–70 years in the districts of Visakhapatnam, Vizianagaram, and Srikakulam in Andhra Pradesh. The study included participants from both urban and rural communities in order to obtain a broader understanding of awareness levels across different social and geographical backgrounds. Cervical cancer remains one of the leading causes of cancerrelated deaths among women in developing countries, mainly due to lack of awareness, poor screening practices, and limited access to healthcare facilities. Therefore, understanding women's knowledge and perceptions regarding cervical cancer is important for planning effective prevention and awareness programs.

Data were collected from 200 women, including housewives, employed women, and students, who were registered at Mahatma Gandhi Cancer Hospital and Research Centre, Visakhapatnam, for treatment procedures such as surgery, radiation therapy, and chemotherapy during the period of 2019–2020. The participants were selected to represent women from different educational, occupational, and socio-economic backgrounds. Prior to data collection, the purpose of the study was clearly explained to all participants, and informed consent was obtained. Confidentiality and privacy of the respondents were maintained throughout the study.

A structured questionnaire was used as the main tool for data collection. The questionnaire consisted of two sections. The first section included personal and demographic details such as age, height, educational qualification, occupation, socio-economic status, marital status, place of residence, and family history of cancer. The second section focused on assessing participants' knowledge and awareness regarding cervical cancer, its symptoms, risk factors, preventive measures, and screening methods.

Information regarding reproductive and lifestyle factors was also collected, including age at marriage, age at first childbirth, number of children, number of sexual partners, menstrual and reproductive history, smoking and alcohol consumption habits, personal hygiene practices, and use of contraceptives. Participants were further asked about common symptoms of cervical cancer such as abnormal vaginal bleeding, pelvic pain, foulsmelling discharge, and pain during intercourse.

The questionnaire also assessed awareness regarding risk factors associated with cervical cancer, including early marriage, multiple sexual partners, human papillomavirus (HPV) infection, poor genital hygiene, long-term oral contraceptive use, smoking, weakened immune system, and lack of regular medical check-ups. In addition, participants were asked whether they had heard about cervical cancer screening tests such as the Pap smear test and HPV vaccination, and whether they had ever undergone screening or received vaccination.

The collected data helped in evaluating the level of awareness, attitudes, and preventive practices related to cervical cancer among women in the selected districts. The findings of the study may help healthcare professionals, policymakers, and public health organizations to develop educational programs and awareness campaigns aimed at improving early detection and prevention of cervical cancer, particularly among women living in rural and underserved areas.

V. SYMPTONS AND CLINICAL FEATURES

Cervical cancer is a slowly developing disease that may not show any symptoms in its early stages. Precancerous changes and early cervical cancer often go unnoticed, which is why regular screening is very important for early detection and prevention. As the disease progresses, different symptoms start appearing due to the growth and spread of the tumor to nearby tissues.

One of the earliest and most common signs of cervical cancer is abnormal vaginal bleeding. This bleeding may happen between menstrual periods, after sexual intercourse, after menopause, or even after a pelvic examination. The bleeding occurs because cancerous tissues are delicate and contain abnormal blood vessels that bleed easily. Another common symptom is unusual vaginal discharge, which may be watery, thick, blood-stained, or foulsmelling because of tissue damage and infection.

As the tumor grows, many women may experience pelvic pain or discomfort in the lower abdomen. Some may also feel pain during sexual intercourse, a condition known as dyspareunia, caused by irritation and inflammation of cervical tissues. In advanced stages, symptoms may become more severe and can include heavy vaginal bleeding, tiredness, weakness, weight loss, and loss of appetite.

When cervical cancer spreads beyond the cervix, further complications can occur. If the cancer affects the urinary bladder or ureters, it may cause painful urination, blood in urine, frequent urination, or blockage of urine flow. If it spreads to the rectum, it can lead to constipation, rectal bleeding, or painful bowel movements. Pressure on pelvic nerves and lymphatic vessels may result in lower back pain, leg pain, and swelling of the legs due to blockage of lymph flow.

During medical examination, the cervix may appear enlarged, irregular, ulcerated, and fragile, and it may bleed easily when touched. In advanced stages, the disease may also spread to nearby lymph nodes and distant organs such as the lungs, liver, and bones.

VI. DISCUSSION AND RESULT

Cervical cancer is one of the most commonly screened cancers worldwide, especially in developed and middle-income countries. Regular cervical screening programs using the Pap smear test every 3–4 years have greatly reduced both the incidence and mortality of cervical cancer. Studies from Europe, North America, Japan, Australia, and New Zealand have shown up to an 80% reduction in cervical cancer cases and deaths due to effective screening programs. Similarly, a cervical cancer screening program in Taiwan reported a 47.8% decrease in invasive cervical cancer cases between 1995 and 2006.

In the present study, the mean age of participants was 43.8 years. This age group is considered important because cervical cancer most commonly develops between 40–50 years of age, while precancerous lesions usually appear 5–10 years earlier. The most common clinical symptom observed among women with epithelial cell changes was abnormal vaginal discharge. Previous studies have also shown that HPV infection, intraepithelial lesions, and abnormal vaginal discharge are closely associated. Therefore, abnormal vaginal discharge should not be ignored, as it may indicate underlying cervical abnormalities.

The study also found that 40.6% of participants had previously undergone a Pap smear test. This percentage is higher than some earlier studies conducted in Turkey, where screening rates ranged between 10% and 20%. However, in developed countries, Pap smear screening rates are reported to be close to 90%. These differences may be due to variations in awareness, accessibility of healthcare services, and study methods.

The study highlights the importance of regular cervical cancer screening in the early detection and prevention of cervical cancer. Pap smear testing plays a major role in identifying precancerous lesions before they progress into invasive cancer. The findings also show that abnormal vaginal discharge is an important symptom associated with cervical abnormalities and should be evaluated carefully.

VII. CONCLUSION

Cervical cancer remains a major public health problem among women worldwide, especially in developing countries where awareness and screening services are limited. Persistent infection with high-risk Human Papillomavirus (HPV) is the main cause of cervical cancer, while factors such as poor hygiene, early marriage, multiple pregnancies, smoking, and lack of regular screening increase the risk of disease

progression.

Early detection through Pap smear tests, HPV testing, and regular gynecological examinations plays an important role in preventing cervical cancer and reducing mortality rates. Screening programs have significantly decreased the incidence of cervical cancer in many developed countries. In addition, HPV vaccination has become an effective preventive measure against cervical cancer.

Improving awareness about cervical cancer, encouraging regular screening, and increasing access to healthcare facilities are essential steps in reducing the global burden of the disease. Early diagnosis and timely treatment can greatly improve survival rates and quality of life among women.

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