



Cervical Cancer in India: An overview of preventive aspects

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Abstract:

Cervical cancer, is mainly caused by Human Papillomavirus infection. It is the leading cancer in Indian women and the second most common cancer in women worldwide. The differential pattern of cervical cancer and the wide variation in incidence are possibly related to environmental differences. Prevention by vaccination is emerging as the most effective option, with the availability of two vaccines. Questions and controversy remain regarding mandatory vaccination, need for booster doses and cost-effectiveness, particularly in the Indian context.

Key words: Cervical Cancer; Human Papilloma Virus; India; Prevention; Vaccination

Introduction

Cervical cancer, is mainly caused by Human Papillomavirus infection. It is the leading cancer in Indian women and the second most common cancer in women worldwide. The differential pattern of cervical cancer and the wide variation in incidence are possibly related to environmental differences [1]. Cancer cervix is a multifactorial disease. A number of risk factors have been associated with cervical cancer, namely; Illiteracy, low socioeconomic status (SES), long duration of married life, early menarche, marital status, early marriage, early first childbirth, age at last child birth (LCB), multiparity, abortion, multiple sexual partners, late menopause, genital infection, poor genital hygiene, tobacco use, passive smoking and contraceptive use [2-6]. The combined effect of these risk factors can help in better prediction of cancer cervix as-compared to the individual effects. In cervical cancer, (cancer of the uterine cervix), cancer develops in the tissues of the cervix, which is a part of the female reproductive system. The cervix connects the upper body of the uterus to the vagina. The endocervix (the upper part which is close to the uterus) is covered by glandular cells, and the ectocervix (the lower part which is close to the vagina) is covered by squamous cells. The transformation zone refers to the place where these two regions of the cervix meet [7].

There are several types of cervical cancer, classified on the basis of where they develop in the cervix. Cancer that develops in the ectocervix is called squamous cell carcinoma, and around 80-90% of cervical cancer cases (more than 90% in India) are of this type [8]. Cancer that develops in the endocervix is called adenocarcinoma. In addition, a small percentage of cervical cancer cases are mixed versions of the above two, and are called adenosquamous carcinomas or mixed carcinomas. There are also some very rare types of cervical cancer, such as small cell carcinoma, neuroendocrine carcinoma etc [7].

Cervical cancer occurs early and strikes at the productive period of a woman's life. The incidence rises in 30-34 years of age and peaks at 55-65 years, with a median age of 38 years (age 21-67 years). Estimates suggest that more than 80% of the sexually active women acquire genital HPV by 50 years of age [9]. At least 15 HPV types associated with malignancy of both genital tract and non-genital tract have been categorized as High Risk (HR) types (HPV 16, 18, 31, 35, 39, 45, 51, 52, 56, 59, 66, 68, 69, 73 and 82), whereas those associated with benign lesions such as genital and skin warts, as Low-Risk (LR) types (HPV 6, 11, 40, 42, 43, 44, 54, 61, 70, 72, 81, CP6108). Although a wide spectrum of HPV is seen across India, HPV-16 and HPV-18 are the most common types [10].

Prevention by early detection:

In Cervical cancer, symptoms often don't manifest until the disease has reached advanced stages where chances of survival are relatively slimmer and treatment more expensive. When symptoms do occur they may include pain or bleeding during sexual intercourse, unusual discharge from the vagina, and/or blood spots or light bleeding other than a normal period. If detected early, it is possible to fight it. Population-based screening with Pap smear is an important secondary preventive measure for cervical cancer that leads to a high-cure rate among cervical cancer patients. According to the American Cancer Society, the 5-year relative survival rate for cervical cancer patients detected in stage 1A is 93 per cent. This drops to 80 per cent in stage IB and is 15 per cent in stage IVB or the most advanced stage. The relative survival rate compares the observed survival with what would be expected for people without the cancer [11].

The Pap test is a simple procedure in which a small sample of cells is collected from the cervix and examined under a microscope. The test detects both precancerous lesions and early stage cancer. However, many low-resource countries do not have the technical and public health infrastructure to support Pap testing for cervical cancer [12]. The most efficient and cost-effective screening techniques in low-resource countries include visual inspection using either acetic acid or Lugol's iodine and DNA testing for HPV in cervical cell samples [13]. A recent clinical trial in rural India, a low-resource area, found that a single round of HPV DNA testing significantly reduced the number of new cervical cancer cases and deaths [14]. HPV genotyping by PCR is necessary for epidemiological studies, the method is expensive, time-consuming and laborious. Development of the Hybrid Capture 2 (HC2) assay system (Digene Corp., Gaithersburg, USA) allowed detection of a cocktail of 13 high-risk HPV types seen most commonly in cervical cancer. This method, though cheaper than PCR, is more expensive than cytology [15].

Prevention by vaccination

The currently available and evaluated HPV vaccines target preventing infection by HPV types 16 and 18. HPV vaccines are prepared from virus-like particles (VLPs) produced by recombinant technology and are given as three 0.5 ml intramuscular injections over a six-month period. Two vaccines that protect against about 70% of viruses that cause cervical cancer are the new promise for preventing cervical cancer worldwide. However, in economically developing countries, the major barrier to widespread use is the high cost of the vaccine. Logistics such as vaccine acceptability and

delivery may also limit population-wide HPV vaccination programs in low- and medium-resource countries worldwide [16]. It is extremely important that all women continue to receive screening services. Current vaccines are only being given to adolescent girls, and even those who have been vaccinated should begin screening at the recommended age since the vaccines do not provide protection for 30% of chronic HPV infections that cause cervical cancer. The Centers for Disease Control (CDC) recommends routine HPV vaccination for 11- to 12-year-old girls and also for women ages 13- to 26-year-old who have not received the vaccination series previously [17].

Creating awareness in the community

Currently, all genital HPV infections cannot be prevented except by abstinence and lifetime mutual monogamy. There is no clear evidence that barrier methods of contraception, most notably use of condoms, confer a protection against HPV infection. Secondly, except for genital warts, the infection is asymptomatic.

HPV transmission is influenced by sexual activity and age. Almost 75% of all sexually active adults are likely to be infected with at least one HPV type. However, vast majority of the infections resolve spontaneously and only a minority (<1%) of the HPV infections progress to cancer. The lifetime risk for genital HPV is 50-80% and genital warts is approximately 5%. [11] In a study done in Gujarat among nursing students, suggests that levels of knowledge and understanding of cervical cancer as well as its preventable nature should be improved and only 5 (5%) respondents underwent Pap test [18]. A recent qualitative study [19] reported a low level of knowledge on HPV and cervical cancer among children, parents, teachers, community leaders and even health service providers of four developing countries (India, Peru, Uganda and Vietnam).

Since screening program is a new concept for the women in these rural areas, initial strategy should be to provide community education and rely on the well organized women self-help groups where women would be trained as local peer educators. Awareness should be given to all members in family regarding the importance of screening for cervical cancer. The number one preventive measure is regular cervical cancer screening, usually in the form of a Pap test. For many patients and especially those over 30, it is also recommended that an HPV test be performed at the same time. In most cases, this combination of testing can detect significant abnormal cell changes before cervical cancer fully develops.

A comprehensive disease control initiative by applying the three levels of prevention should be planned to reduce the disease burden. A combination of increasing awareness among public and effective HPV vaccination (primary prevention). With improved screening and treatment of precancerous lesions (secondary prevention).

Primary cancer prevention encompasses a healthy lifestyle and includes all measures to avoid carcinogen exposure and promote health. The focus of primary prevention is to prevent a cancer from ever developing or to delay the development of a malignancy.

Secondary prevention refers to the early detection and treatment of subclinical, asymptomatic, or early disease in individuals without obvious signs or symptoms of cancer. Secondary cancer prevention includes identifying people who are at risk for developing malignancy and implementing appropriate screening recommendations based on the risk assessment. Screening may include physical examinations, self-examinations, radiologic procedures, laboratory tests, or other examinations. Examples of secondary cancer prevention include the use of the Pap smear to detect cervical cancer. Screening tests seek to decrease the morbidity and mortality associated with cancer. Following a positive screening test, further diagnostic testing is required to determine if a malignancy exists.

Tertiary prevention includes monitoring for and preventing recurrence of the originally diagnosed cancer and screening for second primary cancers and long-term effects of treatment in cancer survivors. The focus of this form of prevention is aimed at detecting complications and second cancers in long-term survivors when treatment is most likely to be effective and ultimately improve their quality of life. The survival or reduced morbidity due to cervical cancer is markedly affected by the extent and stage of disease at the time of diagnosis.

National Cancer Control Programme, should take a lead in spreading the message of prevention of Cervical cancer by using different media tools and through screening camps for early detection of cervical cancer.

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