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Review article

Knowledge and perception of cervical cancer: An updated review

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Abstract

Midlife has emerged as an important developmental transitional point for both men and women. It is marked important turning point in the lifecycle of a woman. It is a period of continuous biological changes. The cervix is the lowest portion of the uterus. Normally the cervix has stop growing by puberty, but its cells will continue to divide to replace those that die of injury or old age. Sometimes an abnormal cell may arise which later on divides out of control. This will then form a tumour. Cervical cancer starts in just one single cell, but this cell quickly divides to form many similar cancer cells, which continues to grow. Eventually, if not cured, these cells push the normal cells out of the way, grow into a large tumour and spread to other parts of the body leading to fatal complications. The aim of this systematic review is to provide an overview of the study is to prevention of advanced stage cervix cancer by detecting it at early stage through screening and to educate adolescent girls about prevention of cervical cancer by valuation, this will improve their knowledge and help to prevent to reduce mortality and morbidity due to cervical cancer.

Keywords: Adolescents girls, cervical cancer, knowledge, practice, prevention.

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1. Introduction

Cancer imposes a heavy societal burden worldwide, in terms of both epidemiology and costs. Prevention, and particularly primary prevention, is an effective way of addressing the challenging issue of cancer, since between a third and a half of cancers could be prevented on the basis of our current knowledge of risk factors. Moreover, prevention is cost-effective, its effects are not limited to high-risk subjects but extend to the entire population, and it is not dependent on socioeconomic status. Regulatory measures can have a broad impact, even on future generations; by empowering and educating subjects, promoting healthy behaviours and teaching self-care, they can trigger a virtuous cycle. Carcinoma of the uterine cervix is the most common cancer in South Indian women and occupies the top rank among cancers in women in most developing countries, constituting 34% of all women's cancers.

To an estimated annual global incidence of 500,000 cervical cancers India contributes 100,000 i.e., 1/5th of the world burden. The magnitude of the problem is thus more than evident.

The risk factors for cervical cancer include illiteracy, early menarche (< 13 years), marital status (widow, separated, divorce),early marriage (< 18 years) long duration of married life (> 25 years), multiparty(> 3), early child birth (< 18 years), history of abortion (termination of pregnancy before 20 weeks of gestation or below 500 gm weighing foetus), multiple sexual partners (spouses), late menopause (> 45 years) history of HPV infection or genital infections (history of vaginal discharge, boils, ulcers over genital area, burning maturation or history of warts), poor genital hygiene (Grade III and IV), history of tobacco use and history of passive smoking .

Accumulated incidence based on a etiologic associations and the differential world patterns points to cervical cancer being a preventable disease. Primary prevention, then involves the education of a large segment of the population, especially the high-risk groups. Emphasis on sexual hygiene, the use of barrier contraception (condoms) and control of HPV infection and many others may largely achieve this objective but there is need for long-term education and acceptance.

In India due to lack of exposure to knowledge on cervical cancer, women are unaware of prevalence, prevention and its early detection. It still remains the mangos' common cancer among women in India.

Teachers play an important role in education. The women most at risk for cervical cancer are married women over the age of 30 years, in rural and urban areas, with little or no education. This however is precisely the group that resists any progressive health programme, unless handled with understanding, circumspection and sympathy and possibly in prevention of cancer. An awareness programme on primary prevention can bring change in their lifestyle, social customs and hygiene practices. So, the ultimate need of the study is to promote preventive behaviours and prevent advanced stage cancer cervix by detecting it at early stage through screening, so researcher thought to educate to adolescent girls about prevention of cervical cancer by valuation which will improve their knowledge and help to prevent to reduce mortality and morbidity due to cervical cancer.

The global burden of cancer imposes a heavy societal burden worldwide, in terms of both epidemiology and costs [1, 2]. Despite striking advances in the field of molecular oncology, combating cancer remains a challenge. The introduction of more sophisticated imaging and diagnostic techniques and advanced drugs that specifically target tumour cells (so-called individualized drug therapy) is driving up the costs of treatment [2, 3]. As a consequence, the benefit of these achievements may be scarcely affordable and the costs could dramatically impact on healthcare systems [2, 3]. Despite its alleged advantages, the implementation of genomics in routine clinical practice remains far from cost-effective [3]. As Vines and Wild maintain [1], prevention, and specifically primary prevention, is a particularly effective way to address the challenging issue of cancer. Primary and secondary prevention offers several advantages: 1. as such programs are population-based, they could benefit people other than those directly targeted [1]. 2. As cancer has a long latency period, its causes and risk factors could be eliminated or reduced in the long term, thus yielding a broader impact on Public Health. Interventions are not limited to surgical or pharmacological treatments, but include a variety of programs and measures aimed at correcting unhealthy lifestyles and favouring continuous transformation, for example through regulation against occupational or environmental exposure to certain substances. By empowering and educating people, promoting healthy behaviours and teaching self care, a virtuous cycle can be set in motion, meaning that these preventive efforts do not need to be renewed with every generation. This is important in periods of economic and financial hardship, when public resources are scarce [1]. Moreover, some regulatory measures could help to prevent various types of cancer and other pathologies; for example, cigarette smoking, besides being associated with lung cancer, could lead to an increased risk of developing

breast cancer [4], prostate cancer [5], lymphoma [6] and other diseases [7]. In addition, avoiding exposure to carcinogenic substances may contribute to preventing other non-communicable diseases (NCDs), such as cardiovascular, reproductive, endocrine and dysmetabolic pathologies [1, 14].

The association between cigarette smoking and breast cancer risk remains unclear. Few studies have examined cigarette smoking of very long duration as there may not have been a sufficient number of long-term smokers in studies conducted before the 1980s. A study was examined to find the association between smoking and breast cancer risk using data from participants in a randomized controlled trial of screening for breast cancer involving 89,835 women aged 40–59 years at recruitment and with up to 40 years of smoking duration at that time. Current smokers were slightly younger and slightly leaner than never- or former smokers and less likely to have completed postsecondary education (Table I). Current smokers had a higher percentage of HRT use than former or never-smokers and a lower level of alcohol consumption; they were also more likely to have a family history of breast cancer. Current smokers reported smoking on average 18.5 cigarettes/day, while former smokers reported having smoked on average 15.4 cigarettes/day. In addition, current smokers were less likely to have their breast cancer detected by mammogram (9.7%) than former smokers (11.0%) or never-smokers (12.6%), though these differences were not statistically significant (p _ 0.17) [4].

Table I – Baseline characteristics of the study cohort

SN	Characteristics	Baseline smoking status		
1		Never (n= 46,863)	Former (n=23,002)	Current (n=19,942)
2	Person-years	498,516	214,386	211,287
3	Age at baseline (mean years)	48.8	48.6	48.1
4	BMI (median kg/m2)	24.2	24.1	23.8
5	Parity (mean number of children)	2.6	2.4	2.5
6	Age at menarche (mean years)	12.8	12.8	12.8
7	Vigorous physical activity (%)	60.1	59.1	63.4
8	Education (% postsecondary)	27.0	32.5	21.7
9	OC use (%)	54.3	63.3	62.9
10	HRT (%)	24.4	25.4	27.9
11	History of benign breast disease (%)	15.4	16.8	16.7
12	History of breast self-exam (%)	20.1	53.1	46.7
13	History of mammogram (%)	27.3	27.3	26.8
14	Family history of breast cancer (%)	12.0	12.1	12.6
15	Menopausal status (% postmenopausal)	37.3	36.1	37.4
16	Alcohol consumption (none %)	25.6	20.2	18.0

Cervical cancer

Cervical cancer with an estimated 520,000 new cases and 274,000 deaths reported

annually (WHO/ICO Information Centre on HPV and Cervical Cancer- HPV and cervical cancer statistics in India. 2010). About 86% of the cervical cancer cases occur in developing countries, which represents 13% of all female cancers (WHO/ICO Information Centre on HPV and Cervical Cancer- HPV and cervical cancer statistics in India. 2010).

Cervical cancer is sub-divided into cervical squamous cell carcinoma and cervical adenocarcinoma [15]. Majority of the cases of cervical cancer are squamous cell carcinoma and adenocarcinomas are rare.Cervical squamous cell carcinoma develops gradually over time from pre-existing non-invasive squamous precursor lesions, also called cervical intra epithelial neoplasias or squamous intraepithelial lesions. The latency period between normal HPV infections to establishment of cancer may take over a decade [16].

Etiology

There has been significant progress in the etiology of cervical cancer during the last few decades. Sexually transmitted infectious agents such as gonorrhoea, Chlamydia, syphilis, and Herpes simplex virus type 2, were considered to be the causative agents for cervical cancer Between the years 1974 to 1976, Prof. Harold zur Hausen started to postulate and established the link between Human papillomavirus (HPV) and cervical cancer [17] and for his contribution in unravelling this link, he was conferred with 2008 Nobel Prize for Physiology and Medicine. During the early 1980s development of technology to detect for the presence of HPV DNA in cellular specimens provided the strong basis for the definite etiological role of HPV in cervical cancer [17,18]. The first HPV types isolated from cancer biopsies of the cervix were HPV16 and 18: these were cloned in 1983 and 1984 respectively. Following this, there was an explosion of research on papilloma viruses [19].

Papillomavirus infections in humans are known to cause varietyof benign proliferations; these include warts, intraepithelial neoplasias, anogenitalpapillomas, oral laryngeal and pharyngeal papillomas [17]. Molecular and epidemiological evidence has now established that HPV types associated with anogenital neoplasms, including condylomata, cervical dysplasia and cervical carcinoma, are almost always sexually transmitted [20].

The involvement of HPV in cancers of the vulva, anal canal, vagina is currently being identified in addition to these, the possible infectivity of HPV incutaneous cancer, oral cancers and other cancers of the upper aero digestive tract is being investigated [21]. In humans, specific papilloma virus types have been associated with over 99% of cervical cancer biopsies [22].

These are considered the “high-risk” types and include, in order of prevalence, HPV types 16, 18, 31 and 45 [23]. HPVs have also been associated with other anogenital lesions and carcinomas, oral and pharyngeal papillomas and skin lesions in a rare genetic disorder called epidermodysplasia verruciformis.

Classification and distribution of Papillomas virus

Due to the similarity in genome and non-enveloped capsids, papilloma viruses had previously been grouped together with polyoma viruses in one family *Papovaviridae*. Later, it was established that the two virus groups have difference in genome sizes as well as genome organization and have no significant similarities in the nucleotide or amino acid sequences. The International Committee on the Taxonomy of Viruses (ICTV) has assigned papilloma virus separate genera [24].

Classification: High risk and low risk types of HPV

Genital HPV types are classified into low-risk types and high-risk types. Where low-risk types cause warts and high-risk types, which causes15invasive cervical cancer. Although 13 to 19 high-risk types have been identified, only the 12 HPV types namely 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58 and 59 are consistently observed clinically [25]. Apart from the high-risk types, six more genotypes

((26, 53, 66, 68, 73 and 82) have been identified as “probably high risk” [26].

Cervical cancer prevalence in India

India has a population of 366.58 million women of ages 15 years or older who may be potentially at risk of developing cancer of uterine cervix. Current estimates indicate that every year approximately 134,000women are diagnosed with cervical cancer of which more than half (72,825) die from the disease in India. Cervical cancer is the most frequent cancer in Indian women and about 7.9% of women in the general population are estimated to harbour persistent HPV infection at any given time.

Human Papillomavirus (HPV):

HPV infection, unlike many genitourinary infections, is not usually associated with immediate symptoms such as itching, burning, and vaginal discharge [27]. Rather, the majority of those infected with HPV will not develop clinical disease or symptoms because the host immune system resolves most infections. In one study, only24.8% of women infected with HPV 6 or 11 actually developed genital warts [27]. A large, prospective 10-year cohort study of more than 20,000 women enrolled in a health maintenance organization36found that the incidence of CIN 3 or cancer was approximately 7% in HPV-positive women for the duration of the study [28]. Thus, only the minority of patients with HPV infections develop serious clinical complications. The exact mechanism by which HPV infection is cleared by the host immune system is currently unknown. A number of factors are associated with an increased risk of initial infection and/or clinical advanced stage such as genital warts, invasive cancer.

HPV Transmission

Carcinogenic genital HPVs are mainly sexually transmitted through contact with infected cervical, vaginal, vulvae, penile or anal epithelium. There are reports indicating the non-sexual transmission of HPV and this may be due to direct contact with the skin or mucous as or indirectly transmitted through contaminated objects, or during the prenatal period [29].

Perinatal transmission may occur: directly, in delivery by caesarean section by transferring infection from the vaginal canal, after a premature rupture of the amniotic membranes [30]. Also, during the time of fetus passage through the birth canal and on coming into contact with infected maternal secretions [31]. Indirectly the virus may be transmitted during vaginal delivery from contaminated objects; and intrauterine transmission at the time of fertilization from sperm carrying latent HPV [32]; ascending infection from secretions of the maternal genital tract; and transplacental transmission [33].

Prevention of cervical cancer:

A number of different strategies for cervical cancer prevention have been identified, including cervical cytology methods, HPV DNA testing, and a variety of iterations of direct visual inspection of cervix. In developing countries, no clinically significant reduction in the incidence of cervical cancer has occurred during the past three decades [34,35].Poor nutrition and general health status resulting in impaired immune function and other social, behavioural, and possibly genetic factors may also contribute to the high prevalence of virally associated tumours in the developing countries. In the developed world, by contrast, there has been a major decline in cervical-cancer mortality after the introduction of large-scale cytological testing.

HPV Screening by Papanicolaou (Pap) smears in the United States have resulted in a 70% reduction in the mortality from cervical cancer during the past 50 years [36, 37].

As an alternative to the cytology based detection tests several other testshave been developed. Among these the widely used method is visua linspection of cervix. This is performed in two approaches i.e; visual inspection with acetic acid (VIA) and visual inspection with Lugol’siodine(VILI). The first method, VIA is also called as direct visual inspection (DVI) or colposcopy, in this method cervix is examined visually using bright light after one min application of 3-5%

acetic acid using cotton swab. If aceto white areas observed near to squamo columnar junction (SCJ) then indicates test is positive. Aceto-whitening is thought to be dueto reversible coagulation of intercellular proteins followed by acetic acidapplication. The second visual inspection approach, in which cervix isexamined visually after application of Lugol's iodine also known as VILI.If the test is positive mustard-yellow areas on the cervix is observed.

The advantage of visual inspection approach is that it gives immediate result for treatment. In addition, ineffective screening programs to identify lesions at a precancerous, treatable stage leads to the high incidence of cancer in the developing world. In the developing countries like India, few screening strategies have shown population level effectiveness over the long term. Indeed, effective HPV prophylactic vaccination in these populations would result in the greatest impact on the global cervical cancer burden.

Two different strategies may be employed for the development of vaccines against HPV based cancers and these are prophylactic and therapeutic vaccines.

Prophylactic Vaccines

Currently, two prophylactic HPV vaccines have been developed commercially [38; 39; 40; 41]. One of the vaccine is quadrivalent (HPV 6, 11, 16and 18) Cervarix® (produced by GlaxoSmithKline). In these prophylactic vaccines HPV major capsid protein, L1 are presented in the form of virus like particles (VLPs) expressed (for Cervarix®). VLPs do not contain oncogenic viral DNA, thus they are non-infectious and non-oncogenic. They resemble virions and elicit virus-neutralizing antibodies .the prerequisite for effective prophylactic vaccines against most other viruses. These two vaccines are recommended for vaccinating young adolescent women at or before onset of puberty. Both these vaccines are administered by intramuscular route,in three doses (0, 1 or 2 and 6 months). The clinical trial data of both thevaccines showed near 100% seroconversion in the different populations.The Peak geometric mean antibody titers (GMTs) elicited by these vaccinewere almost 50 - 100 fold higher than that of the natural antibody titers.

Knowledge, attitude and practice regarding cervical cancer:

A single public health measure would have multiple, enduring "cascade effects" which a single clinical intervention would not have. Prevention is cost-effective and can impact positively on socio-economic inequalities [8-12]. Since up to half of cancers could be prevented on the basis of present knowledge of etiopathogenesis and risk factors [1], preventive medicine can act as a rapid and effective means of connecting research with clinical practice [13]. Primary and secondary prevention should therefore be regarded as a priority for global cancer control [1].

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