Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination

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Introduction

Cervical cancer is a malignant neoplasm of the cervix uteri or cervical area. Globally, cervical cancer is the second most common cancer amongst women, after breast cancer. However, it is the most common cancer affecting Indian women. Approximately 200 women die every day due to cervical cancer in India.

Cervical cancer is caused by persistent oncogenic HPV (Human papillomavirus) infection. Other risk factors other than HPV infection include smoking, immunosuppression, dietary factors, hormonal contraception, multiple pregnancies, chlamydial infection, low socioeconomic status and a family history of cervical cancer which are contributory to the development of cervical cancer and need to be tackled.

Cervical cancer commonly presents with vaginal bleeding however symptoms may be absent till the cancer is in its advanced stages. Hence the need to adopt regular screening methods to detect the disease earlier, in its pre-cancerous stage. The American Cancer Society (ACS) [1] recommends that cervical cancer screening should begin approximately three years after the onset of vaginal intercourse and/or no later than twenty-one years of age. However in a developing country like ours, where screening is sporadic due to poor funding, lack of infrastructure and low level of awareness about the disease, this becomes a difficult task.

The newly developed HPV vaccine holds great light in the fight against cervical cancer. Although vaccination to prevent HPV infection and thus cervical cancer seems an attractive option, the major obstacles include cost acceptability, lack of public awareness and infrastructure, concern about unknown side-effects and social and religious barriers.

Vaccination and screening, which are complementary and synergistic, now constitute the new paradigm for prevention of this disease.

Women, who are the home makers of Indian society, are affected to a great degree if they develop cervical cancer. The stigma associated with cancer is grave and so it is absolutely essential to educate the women about cervical cancer and make them aware of risk factors, screening methods and vaccination. With the changing attitudes of the youth today and changing sexual behavioral patterns, sex education in school can be used to propagate awareness about safe sex practices.

Lack of awareness about the disease with respect to risk factors, screening methods and vaccination is a major hindrance for early detection and prevention of disease. The higher the awareness among Indian women about the disease, the earlier will be the identification and appropriate treatment can be started at an earlier stage of the disease. The desire to understand and promote awareness regarding cervical cancer is what has fueled us to conduct this study. The awareness about cervical cancer amongst the different social classes can then be studied so that we can ascertain which social class of Indian society needs to be made aware about cervical cancer. This study also aims to determine the main source of awareness of most Indian women so that the same can be used to further propagate and spread the wealth of knowledge. The study also aims to determine the attitudes of Indian women towards screening for diagnosis of cervical cancer. Lastly, this study shall attempt to investigate the acceptability to the usage of the vaccine in the Indian population and determine the possible barriers to the implementation of the vaccination program.
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There is an urgent need to increase cervical cancer awareness in the community and to develop community-based screening and vaccination programs. Health and education ministry should promote a special course on cervical cancer for Indian women.

Review of Literature

Cervical cancer is a malignant neoplasm of the cervix uteri or cervical area. It may present with vaginal bleeding but symptoms may be absent until the cancer is in its advanced stages [2].

Symptoms of the cancer include abnormal bleeding, post-coital bleeding, foul smelling vaginal discharge, low back pain, dysuria, dyspareunia, hematuria, constipation, etc. Patient is often asymptomatic and presents in the later stages of cancer with the above mentioned symptoms [3].

Pathological grading of cervical cancer includes CIN 1, 2, 3 or LSIL and HSIL according to the Bethesda system. Clinically, AJCC has given four stages of the cancer [3].

Cervical cancer is the second most common cancer among women worldwide, and one of the leading causes of cancer in the developing countries including India. Most recent estimates suggest that each year there are more than a quarter of a million deaths from cervical cancer and over 500,000 new cases, most of which could be prevented. The WHO projects that without immediate action the global number of deaths from this disease will increase by nearly 80% by 2030, mostly in low and middle income countries [4].

There has been a regular campaign against cervical cancer for 30 years in India, but this has had little impact on the morbidity and mortality from the disease, with India ranking fourth worldwide. The number of deaths due to cervical cancer is estimated to rise to 79,000 by the year 2010. Approximately 200 women die due to cervical cancer everyday in India. The cancer mostly affects middle-aged women (between 40 and 55 years), especially those from the lower economic status who fail to carry out regular health check-ups due to financial inadequacy [5].

In urban areas, cancer of the cervix account for over 40% of cancers while in rural areas it accounts for 65% of cancers as per the information from the cancer registry in Barshi [5].

Risk factors for cervical cancer

Role of HPV in the causation of cervical cancer

HPVs are non-enveloped, double-stranded deoxyribonucleic acid (DNA) viruses in the family of Papillomaviridae [6]. They colonise the epithelial layer of skin and mucous membrane and produce a wide range of changes, ranging from asymptomatic mild grade infection to koilocyte formation and dysplasia and eventually after a long period of latency, frank carcinoma [3].

More than 150(some sources say more than 200 subtypes) HPV genotypes are known [7,8]. Of these, 15 are classified as high-risk types (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, and 82), 3 as probable high-risk (26, 53, and 66), and 12 as low-risk (6, 11, 40, 42, 43, 44, 54, 61, 70, 72, 81, and CP6108), but even those may cause cancer. Types 16 and 18 are generally acknowledged to cause about 70% of cervical cancer cases [9].

Research studies have shown that prevalence of HPV infection among general population in the developing nations (India, Bangladesh, Nepal, and Sri Lanka) varies from 7 - 14%. This observation maybe the result of a low clearance rate of incident infections, frequent re-infections, limited or no data in target high-risk groups and sexual behavioral patterns in the population. High risk HPV types were found in 97% of cervical cancers in India and HPV 16 & 18 were found in 80% of cancers in India [10].

In a study conducted by Hoque ME [11] amongst South African university students, of the 33% who had heard about cervical cancer, only 32% had heard of HPV virus as a risk factor for cervical cancer. 26% had heard of multiple sexual partners as a risk factor. This highlighted the importance of developing policies on health education to prevent transmission of the HPV virus.

Citation: Charu Dutt Arora, et al. “Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
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This is of special importance and correlates well with my survey, thus highlighting the urgent need for using health education as a primary preventive measure to spread awareness about the role of Human papillomavirus as a major causative factor for cervical cancer along with conventionally known other risk factors and measures to prevent them.

Other risk factors

The American cancer society gives a list of risk factors / predisposing factors for cervical cancer. These include smoking, immunosuppression, dietary factors, hormonal contraception, multiple pregnancies, early age at pregnancy, multiple sexual exposures, early age at sexual intercourse, chlamydial infection, low socioeconomic status and a family history of cervical cancer [12]. The role of HPV in causation of cervical cancer has already been illustrated with the help of various studies.

A WHO publication, IARC handbook of cancer prevention [13] gave a preview of the demographic determinants of risk factors. It was noted that cervical cancer has quite marked differences according to classical variables (age, social class, marital status, ethnicity, religion, occupation). Later case control studies showed significant associations between early age at initiation of sexual activity, promiscuous sexual behavior; etc. One of the earliest observations in cancer epidemiology was the rarity of cancer of the cervix among (unmarried) nuns, an observation that has been confirmed more recently. The striking contrast of this is the higher incidence among prostitutes. Risk is higher in women who are divorced or separated than in married women. The risk of cervical cancer is especially high among women marrying at young ages. These associations are related to other aspects of sexual behavior such as number of sexual partners and age at initiation of intercourse.

The American Cancer Society research studies [12] show that women who smoke are twice as likely as non-smokers to get cervical cancer. There is evidence that taking oral contraceptives (OCs) for a long time increases the risk of cancer of the cervix. Research suggests that the risk of cervical cancer goes up the longer a woman takes OCs, but the risk goes back down again after the OCs are stopped. In a recent study, the risk of cervical cancer was doubled in women who took birth control pills longer than 5 years, but the risk returned to normal 10 years after they were stopped. DES is a hormonal drug that was given to some women to prevent miscarriage between 1940 and 1971. Women whose mothers took DES (when pregnant with them) develop clear-cell adenocarcinoma of the vagina or cervix more often than would normally be expected. This type of cancer is extremely rare in non-DES exposed women. Similarly risk of 2 - 3 times higher in those having positive family history [12].

Women of lower socioeconomic status (defined by, for example, income, and educational level or housing type) are at higher risk for cervical cancer. HPV infection appears to be more prevalent in women of lower educational and income levels. Other correlates of social status such as nutrition, genital hygiene, parity, and smoking, other genital infections and use of preventive services (especially screening) may be responsible for the observed differences. Varghese (2000) found a significant association between social status and HPV infection in India, and social status remained a determinant of HPV infection even after adjustment for promiscuity [13].

In my study, I compared the level of awareness of cervical cancer with the socioeconomic and educational status. The above study of the high incidence of cervical cancer in women of lower socioeconomic status highlights the importance of carrying out such a comparison in our study.

The low level of awareness about the mode of spread of HPV due to high-risk behavior also highlights the importance of our study.

Screening Methods

Screening programs form the mainstay for the early diagnosis, prevention and subsequent treatment of cervical cancer. It has been widely believed that invasive cervical cancer develops from dysplastic precursor lesions, progressing steadily from mild to moderate to severe dysplasia, then to carcinoma in situ, and finally to cancer. It now appears that the direct precursor of cervical cancer is high-grade dysplasia, which in about a third of instances may progress to cervical cancer over a period of 10 – 15 years, while most low-grade dysplasia’s regress spontaneously [14]. The various screening methods include cytological testing (Pap smear), direct visual inspection by acetic acid or Lugol’s iodine, HPV testing, colposcopy and other biopsy procedures [3].

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In developed countries, initiation and sustenance of cervical cytology programs such as Pap smear testing involving the screening of sexually active women annually, or once in every 2 - 5 years, have resulted in a large decline in cervical cancer incidence and mortality over the last 40 - 50 years. The aim of these programs is to detect precancerous lesions and treat them before they progress to invasive cancer. In contrast, the risks of disease and death from such lesions have remained largely uncontrolled in high-risk developing countries, mostly because of the lack of screening programs or because of their ineffectiveness. The incidence of cervical cancer can be reduced by as much as 80% if the quality, coverage, and follow-up of screening are high [14].

India accounts for one-fifth of the world burden of cervical cancer. There are no organized or high level opportunistic screening programs for cervical cancer in any of the provincial states. Data from population-based cancer registries in different regions indicate a slow, but steady, decline in the incidence of cervical cancer. However, the rates are still too high, particularly in the rural areas, and the absolute number of cases is on the increase due to population growth [14].

Efforts to improve awareness of the population have resulted in early detection of and improved survival from cervical cancer in a backward rural region in western India.

Also in two sub-districts of western India where the literacy among women is less than 20% there have been attempts to evaluate the role of improved awareness in the early detection and control of cervical cancer [14].

Person-to-person and group health education on cervical cancer were provided to 97,000 women in Madha Tehsil, Solapur district, Maharashtra State, in western India; 79,000 women in Karmala Tehsil served as the control population. This program was initiated in 1995 and the preliminary results for 1995 - 99 indicate that, compared with the control area, in the intervention sub district a substantially higher proportion of women presented with cervical cancer in earlier stages with significantly reduced case fatality [14].

### Outcome of information/education on the control of cervical cancer, Solapur district, Maharashtra, 1995-99 [14].

<table>
<thead>
<tr>
<th></th>
<th>Intervention area (Madha Tehsil)</th>
<th>Control Area (Karmala Tehsil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of women</td>
<td>96,908</td>
<td>76,084</td>
</tr>
<tr>
<td>No. Of women –years</td>
<td>352,628</td>
<td>380,805</td>
</tr>
<tr>
<td>No. Of incident cervical cancers</td>
<td>80</td>
<td>64</td>
</tr>
<tr>
<td>Stage I and II cancers (%)</td>
<td>65.1</td>
<td>32.8</td>
</tr>
</tbody>
</table>
| Age –standardized incidence (per 100,000)
  \(a\)                         | 26.3                             | 18.7                          |
| No. Of deaths from cervical cancer | 17                               | 30                            |
| Age –standardized mortality rate (per 100,000)
  \(b\)                        | 5.6                              | 8.6                           |

\(a\) Incidence rate ratio: 1.41 (95% CI: 1.00 – 1.98). \(b\) Mortality rate ratio: 0.65 (95% CI: 0.36 – 1.18).

Visual inspection-based approaches to cervical cancer screening have been extensively investigated in India. Currently there are several ongoing, cross-sectional studies being carried out on other screening approaches such as VIA, VIA with magnification (VIAM), and VILI, as well as HPV testing as alternative screening approaches [14].

Results from two reported studies indicate that the sensitivity of VIA to detect high-grade lesions was similar or higher than that of conventional cytology but that its specificity was lower [14].

### HPV Vaccine

Human papillomavirus (HPV) is a necessary cause of cervical cancer, the leading cause of cancer deaths among Indian women. Current screening and prevention programs based on cytology have not been effective in reducing the disease burden. Two vaccines, the quadrivalent vaccine (HPV 16, 18, 31, 33) and bivalent vaccine (HPV 16, 18) are now available for primary prevention [15].

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When to vaccinate?

The quadrivalent HPV vaccine was the first to be licensed by the Food and Drug Administration (FDA) for use in girls/women aged 9 - 26 yr. The Advisory Committee for Immunization Practices (ACIP) - has recommended the HPV vaccine for 11 - 12 yr old girls. The vaccine is also recommended for 13 - 26 yr old girls/women who have not yet received or completed the vaccine series. In India, the quadrivalent vaccine is licensed for use in women up to age 26 yr and the bivalent vaccine up to 45 yr [15].

Who to vaccinate?

Since HPV vaccines are prophylactic vaccines, the most appropriate target population for HPV vaccination will depend on the age at which individuals first get exposed to HPV. This depends largely on the socio-cultural behavior patterns of the region [15].

In a survey among college students in Delhi, the age at sexual debut is earlier than the legal age at marriage, which is 18 yr (unpublished data). Similar results have been reported from the National Family Health Survey also. In order to ensure that recipients receive maximum protection, the target population should be young adolescents (9 - 13 yr of age). At this younger age the recipients mount a better immune response. Also, it may be feasible to link vaccine delivery with the school health program and improve coverage. Parental consent will, of course, be a prerequisite regardless of the mode of implementation. It has been seen that < 3 per cent of women suffer from infection of both HPV types [4]. Thus vaccination of sexually active women of any age is recommended as it will still protect against infection with the other HPV type, and may possibly protect against re-infection with the same HPV type in the future [15].

Importance of continuing cervical screening

Even after vaccination programs have been instituted and reasonable levels of coverage obtained, cervical cancer screening programs cannot be discontinued for a number of reasons. One is that the primary target population for vaccination is 9 - 13 yr old females. Secondly, vaccination will not protect against HPV types not included in the vaccines. Although there is evidence that some cross-protection against other high risk types the extent and duration of cross-protection is currently unclear. Since the vaccine does not protect against all types of HPV, as many as 30 per cent of cervical cancers will not be prevented by the vaccine. Thus if women who were previously in a screening program discontinue screening after vaccination, they will actually increase their risk of developing cervical cancer [15].

Obstacles

The major obstacles to implementation of HPV vaccine programs include cost, acceptability, lack of public awareness and infrastructure, concern about unknown side-effects and social and religious barriers. Also, the vaccine does not prevent about 10 per cent of genital warts nor will it prevent other STIs. Parental concerns include the possibility of change in sexual behavior of teenagers due to a false sense of security against STIs which may lead to an increase in other STIs. Since HPV vaccines target cancer prevention it may be difficult for parents to understand the role of vaccinating 9 - 13 yr old girls for a cancer that they are unlikely to develop for at least two to three decades. This problem is exacerbated by the fact that the duration of protection afforded by vaccination is not yet known [15].

However contrasting the findings of the above study by Bhatla N., et al. [15] in India were the studies conducted by Lenselink CH., et al. [16] where parental acceptance to HPV vaccination was as high as 88% and in a Turkish survey [17] where it was 70%. This reflects the variation in socio-cultural behavioral patterns as well as the literacy level.

Our study was so designed so as to assess the acceptance and attitudes of the women towards HPV vaccination keeping in mind the socio-cultural and behavioral patterns of our country. The above studies act as guidance to our study.

Studies conducted in the past

In a study about the awareness and uptake of cervical cancer screening in Owerri, Nigeria conducted by Ezem Bu [18], 846 respondents were given self administered questionnaires. The results showed that 52.8% (447) were aware of cervical screening while 7.1% (60) had done the test. The major source of information about cervical smear was hospital/health facilities (31.3%) and friends (30.9%).

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The most common reasons given for not doing the test were lack of awareness 390 (46.1%), no need for it 106 (12.5%) and fear of a bad result 98 (11.6%). Thus it was concluded that the level of awareness of cervical screening is low and a national cervical smear screening policy was advocated along with greater public education. This is similar to our study which also assess the awareness among women using questionnaire method and by cross sectional study design.

A study on knowledge and health beliefs of cervical cancer screening among college students in Ghana was conducted in April 2009 by Shokar NK [19]. 140 women were recruited for this cross sectional study. The prior Pap screening rate was 12%. The women were unaware of local screening initiatives, and only 7.9% were aware of the link between HPV and cervical cancer. The most prevalent barriers were lack of information about how to obtain screening services. Although women perceived the benefits of screening, about half perceived themselves to be at risk. Other barriers were lack of belief that cancer is diagnosed by screening, belief that pap test is painful, and belief that the test will take away virginity. A similar study can be initiated in India to assess the attitudes of the Indian women towards screening as well as their outlook towards the introduction of the HPV vaccine. However, the study should not be limited only to university students but should include women from different strata of society.

Roy B and Tang S [20] conducted a survey titled cervical cancer screening in Kolkata. Women in a gynecology clinic were recruited and were assessed for their knowledge, beliefs and attitudes about cervical cancer and screening. A total of 10% had received a Pap test at least once. Most women reported limited to no knowledge of cervical cancer (84%) and the Pap test (95%). Findings suggest a need to increase cervical cancer awareness in the community and to develop community based screening programs. This study, like our study was conducted in a clinic and so findings of this study can be extrapolated to our study.

Parental acceptance of Human papilloma virus vaccines is a qualitative study [16] with an objective to determine whether parents would accept Human papillomavirus (HPV) vaccination for their children. Results showed that HPV vaccination would be accepted by 88% of the parents, preferably when the child is aged 10-12 years. Parents of children who received all the vaccinations of the National Vaccination Programme accepted HPV vaccination significantly more. Less than a third of all parents had heard of HPV, and 14% were aware of the causal relationship of HPV and cervical cancer. HPV vaccine acceptance seems to be dependent on vaccine acceptance in general, even more than on knowledge of HPV and its causal relation with cervical cancer. However, parents requested more information about cervical cancer, HPV, and HPV vaccination, before the HPV vaccine is introduced. This study highlights the fact that HPV vaccine acceptance goes hand in hand with vaccine acceptance in general. However, it does not talk about possible barriers that may be encountered while establishing HPV vaccination. Other studies need to be considered to find out the possible barriers and find solution to these problems in order to successfully establish vaccination.

The study titled ‘Women’s knowledge about HPV and their acceptance of HPV vaccine’ [17] conducted among Turkish women. Among the participants, 77% believed that sex education should be provided at school, 45% had heard of HPV and 55% had no knowledge about HPV. It was known by 43% of the women that HPV might cause genital lesions. Of the parents, 40% knew HPV is related to cervical cancer. Of the parents interviewed, 70% reported they would accept HPV vaccination for themselves, 64% for their daughters. This study, like the above study did not try to investigate the possible hindrances in the establishment of a nationwide HPV vaccination program.

Doh P, Seng H., et al. [21] assessed Cambodian American and community leaders. Interview and focus group questions addressed HPV vaccine barriers and facilitators. Participants had limited knowledge about HPV infection and the HPV vaccine. Barriers to HPV vaccination included a lack of information about the vaccine, as well as concerns about vaccine safety, effectiveness, and financial costs. The most important facilitators were a health care provider recommendation for vaccination and believing in the importance of disease prevention. This study points the facilitators and barriers to HPV vaccination acceptance in a community. Health care providers play a key role in promotion of vaccination.

Accurate knowledge about Human papillomavirus (HPV) and its link to cervical cancer is essential for women to understand and make use of cervical cancer prevention and detection opportunities. This study conducted by Cerigo H., et al. [22] was the first to survey aware-
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Awareness of HPV was found to be associated with greater or equal to 13 years of education and knowing someone with cervical cancer. While this study assess the knowledge of women about HPV and its association with cervical cancer, it does not talk about other risk factors such as high-risk sexual behaviour, multiple pregnancies, poor socio-economic conditions, etc which are actually responsible for sexual transmission of HPV. Women must also be made aware of the mode of transmission of HPV and possible preventive measures for it.

A study was conducted by Sehgal A., et al. [23] by survey questionnaire method in order to determine the knowledge of women towards cervical cancer prior to initiation of cytological screening. The Alipur Primary Health Center field practice area of MAMC provides health care to 65,000 people in 27 villages. Non-acceptors of treatment in this group lacked correct knowledge about cervical cancer: 34.5% of acceptors (those who sought treatment, who were informed or those who had gynecological problems) knew about the age of onset, 11.4% about early symptoms, and 24.8% about the method of early detection compared to 30.6%, 0.0%, and 3.7% of non-acceptors, respectively. 68.5% of the non-acceptors had obtained information regarding cervical cancer from relatives, neighbors, and friends, while the acceptors had obtained the information from hospitals and mass media also. 60.2% of acceptors were exposed to family planning compared to 50.9% of non-acceptors. Thus, while the awareness about cervical cancer is generally low, women who had prior contact with health care facilities showed greater level of awareness. This study emphasizes the role of the health care provider in increasing awareness about this topic.

Sankaranarayan R, Bhatla N., et al. [10] point out that although one-third of the world cervical cancer burden is endured in India, Bangladesh, Nepal and Sri Lanka, there are important gaps in our knowledge of the distribution and determinants of the disease in addition to inadequate investments in screening, diagnosis and treatment in these countries. Prevalence of human papillomavirus (HPV) infection among the general populations varies from 7 - 14%. High-risk HPV types were found in 97% of cervical cancers, and HPV-16 and 18 were found in 80% of cancers in India. Cervical cancer is a relatively neglected disease in terms of advocacy, screening and prevention from professional or public health organizations. Cytology, HPV testing and visual screening with acetic acid (VIA) or Lugol's iodine (VILI) is known to be accurate and effective methods to detect cervical cancer and could contribute to the reduction of disease in these countries. While HPV vaccination provides hope for the future, several barriers prohibit the introduction of prophylactic vaccines in these countries such as high costs and low public awareness of cervical cancer. Efforts to implement screening based on the research experiences in the region offer the only currently viable means of rapidly reducing the heavy burden of disease. This study discusses the current scenario about cervical cancer in the developing nations and highlights the importance of carrying out a survey to assess the knowledge and awareness of Indian women and possible solutions to overcome their problems.

In a study on Cervical cancer awareness amongst South African University students and conducted by Hoque ME [11], a third (33%) of the participants heard about cervical cancer. Among them a third (32%) and over a quarter (26%) knew about the HPV virus and multiple sexual partners, respectively, as risk factors for cervical cancer. Participants were twice more likely to use condoms if they heard about cervical cancer. Only 31% participants had heard about the Pap smear test, and among them a third (33%) knew that Pap smear is used for detection or prevention of cervical cancer. It was concluded that University management should concentrate on developing policies on health education and promotion particularly targeting preventable health conditions to prevent transmission of the HPV virus. This study includes university students as a population of study and so the results may be biased since they possess more knowledge than those who have never had any form of education before.

In a survey amongst major hospitals in Malaysia [24], women who were still undergoing treatment for cervical cancer, were given questionnaires to determine their awareness about screening. Most had not had a Pap smear within 3 years before cancer development. The percentages of patients who had had Pap smear ranged from 0 - 12%. 56.3% had none or only primary education and 61.1% had a household income of RM 1,000 or less. Level of education and the household income were strongly associated (p < 0.05) with knowledge
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and having had a Pap test. The main reasons cited for not having had a Pap smear were "Never heard about it" (36.2%), "Shy" (10.4%), "Afraid to do it" (13.1%), "Think the test is not important" (8.1%) and "No encouragement from family" (4.5%). A large majority (95.9%) of the patients did not know the optimal interval. In conclusion, a large number of cervical cancer patients had not had a Pap smear within 3 years preceding cancer development and most had inadequate knowledge about this screening test. This study highlights the role of social class and level of education in awareness about this topic. Such a study can also be done in our country to find out the influence of these factors on level of awareness. Also, since this study is conducted amongst women already having cervical cancer, results could be biased.

A study was conducted among young Dutch adults [25], to determine if they had ever heard of human papillomavirus (HPV) and whether they would accept vaccination, and to assess the factors influencing their decision. One hundred and six (17.7%) participants had heard of HPV and 536 (94%) had heard of cervical carcinoma. In total, 61% of the female participants were willing to accept a 'catch-up' HPV vaccination. Women and younger participants were significantly more willing to accept HPV vaccination. However, in these subgroups, acceptance of HPV vaccination seems to be affected by other, still unidentified, factors. These factors could be evaluated in a more qualitative orientated study. Such a study can also be initiated in our country to find out the level of acceptance towards the HPV vaccine.

In a study among women in Saudi Arabia [26], the knowledge, attitude, and practices related to cervical cancer screening were assessed. The knowledge of the human papilloma virus (HPV) as an etiological agent for cervical cancer was expressed by 72 (14.4%), and the HPV vaccine by 49 (9.8%) of the respondents. Whereas, 338 (67.6%) of the respondents were aware of the Pap smear; however, only 84 (16.8%) had undergone the test. The main reason for not having a Pap smear was the lack of awareness. The awareness on cervical cancer among women in Saudi Arabia is far behind that in the developed countries. There is a need to educate and promote awareness of cervical cancer in this population. Such a study can also be initiated in our country covering women from all strata of society so as to assess the level of awareness among them.

In a study in Taiwan [27] health beliefs and reasons for HPV vaccination among young adult women (aged 18-26 years), and adult women (aged over 26 years) were examined. One hundred and eighty-nine subjects completed a questionnaire on health beliefs and reasons for HPV vaccinations. Health beliefs regarding HPV vaccination differ between young adult women and adult women. Recommendations from others (family, health care providers, etc.) are among the main reasons for young adult women to initiate HPV vaccination; while self-awareness of the risk for HPV infection and personal gynecological diseases are main reasons for adult women to initiate HPV vaccination. Furthermore, women aged 18 - 26 are more likely than women aged over 26 to consider the cost and availability of vaccination. Media also plays an important role in a woman's decision to seek HPV vaccination. This study tries to find out the facilitators and barriers to vaccination. A detailed study to find out the barriers to vaccination and means to overcome these barriers can be undertaken.

Social Classification

Socioeconomic Status (SES) is an important determinant of the standard of living and health status as it influences the incidence and prevalence of various health conditions. Socioeconomic status also influences social security in terms of the accessibility, affordability, acceptability and actual utilization of various health facilities. The need for developing a uniform system of socioeconomic classification of the population universally based on the income with scientific basis and should applied with ease and simplicity in each sector or strata wise of population.

There have been several attempts to develop different scales to measure socio-economic status but Prasad's classification has been extensively used in the Indian scenario and has been quite effective in performing the task under discussion.

Thus, the modified Prasad's Classification [28] currently in use is:

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<table>
<thead>
<tr>
<th>Per Capita Monthly Income (Rs)</th>
<th>Social Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000 and above</td>
<td>(I) Very High</td>
</tr>
<tr>
<td>5,000 - 9,999</td>
<td>(II) High</td>
</tr>
<tr>
<td>3,000 - 4,999</td>
<td>(III) Upper Middle</td>
</tr>
<tr>
<td>1,500 - 2,999</td>
<td>(IV) Lower Middle</td>
</tr>
<tr>
<td>500 - 1,499</td>
<td>(V) Poor</td>
</tr>
<tr>
<td>Below 500</td>
<td>(VI) Very Poor or Below Poverty Line (BPL)</td>
</tr>
</tbody>
</table>

Aims and Objectives

1. To determine the knowledge and level of awareness regarding cervical cancer in women with respect to risk factors, screening methods and vaccination.
2. To identify the source of information for screening methods and vaccination so that the same can be used to further propagate knowledge and awareness regarding cervical cancer.
3. To investigate the attitude of women towards screening for diagnosis of cervical cancer.
4. To investigate the acceptability to the usage of cervical cancer vaccine in the population.
5. To study the correlation between social class of the subject (as per Modified Prasad Classification) with the awareness regarding cervical cancer in women.

Methodology

Study Design: Cross-sectional study.

Settings: Gynecology- Out Patients Department (OPD) & Wards of BYL Nair Charitable Hospital.

Duration: 2 months.

Sample Size: Sample size is 194. While 500 questionnaires were distributed, only of 194 these were returned and contained complete and valid information.

Study Population: Women between the ages of 18-55 years belonging to all strata of society currently residing in Mumbai.

Study Section:

Inclusion criteria

• All women who fall in the age group of 18 to 55 years of age who are non-pregnant
• Written informed consent from women participating in the study.

Exclusion criteria

• Women below the age of 18 years.
• Women above the age of 55 years
• Women who do not consent to be a part of the study

Ethical Consideration: Approval of the institutional ethics committee was taken prior to initiating the study.

Informed Consent: Informed consent was taken from all the women who were willing to participate in the study.

Information Sheet: An information sheet was given to all the participating women.

Methods

Women participating in the study were given a questionnaire on cervical cancer, HPV infection and associated risk factors, screening methods and vaccination and the following parameters were assessed with the help of that.

Citation: Charu Dutt Arora, et al. "Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination". EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination

Parameters of Assessment:
1. Knowledge of women regarding cervical cancer with respect to HPV and other risk factors, screening methods and vaccination.
2. The source of information for screening methods and vaccine.
3. The attitude of women towards screening.
4. The acceptability to the usage of cervical cancer vaccine.
5. Correlation between socioeconomic status and awareness regarding cervical cancer in women.

Knowledge of Women:

Women were asked to provide personal information which included age, educational qualifications, family income per month (from which Prasad’s Class was calculated). Women were asked to answer questions related to cervical cancer-risk factors, screening methods and vaccination and they were assessed for their awareness regarding the same. They were asked to state their source of information for screening methods and vaccination. They were also asked if they have undergone screening procedures. They were also asked if they would accept the usage of the cervical cancer vaccine.

Statistical Analysis:

The data so collected was entered into MS-Excel from where it was transferred to SPSS package for tabulation and analysis. Both, the SPSS software and Graph Pad Instat 3 Software were used for Chi Square Analysis of the data. Graphs were created in MS-Excel. Deductions and discussion was then done using this analyzed data.

Observations and Results

Characteristics of Respondants

Total No. of women contacted: 500
No. of women responded adequately: 194

Knowledge and Awareness Regarding Cervical Cancer

Awareness regarding cervical Cancer

<table>
<thead>
<tr>
<th>Aware of cervical cancer</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>49</td>
<td>25%</td>
</tr>
<tr>
<td>No</td>
<td>145</td>
<td>75%</td>
</tr>
</tbody>
</table>

Citation: Charu Dutt Arora, et al. "Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
Of 194 women that responded to the survey questions, 49 (25%) women had heard of cervical cancer while 145(75%) were unaware or had never heard of cervical cancer.

**Awareness regarding role of Human papilloma virus in the causation of Cervical Cancer**

<table>
<thead>
<tr>
<th>1</th>
<th>Aware of viral infection of the cervix</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>23</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>171</td>
<td>88%</td>
</tr>
<tr>
<td>2</td>
<td>Aware that HPV causes Cervical cancer</td>
<td>Number (N = 194)</td>
<td>Percentage</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>11</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>183</td>
<td>94%</td>
</tr>
<tr>
<td>3</td>
<td>Aware that HPV is sexually transmitted</td>
<td>Number (N = 194)</td>
<td>Percentage</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>17</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>177</td>
<td>91%</td>
</tr>
</tbody>
</table>

23 (12%) of 194 women had heard of viral infection of the cervix while 171 (88%) had never heard of the same.

11 women (6%) were aware that HPV causes cervical cancer while 183(94%) out of 194 women had never heard of HPV causing cancer.
Of 194 women, 17 women, i.e. 9% were aware that HPV is sexually transmitted while 177 (91%) of them had never heard of the same.

**Aware of other risk factors causing cervical cancer**

<table>
<thead>
<tr>
<th>Aware of other risk factors</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>4%</td>
</tr>
<tr>
<td>No</td>
<td>186</td>
<td>96%</td>
</tr>
</tbody>
</table>

8(4%) out of 194 women are aware of other risk factors for cervical cancer while 186(96%) are unaware as assessed by this survey.

HPV is the main causative agent for cervical cancer. The other causative factors asked for in this survey include smoking, immunosuppression, Chlamydia infection, Oral contraceptive pills, multiple full term pregnancies, young age at first full term pregnancy, poverty/low socio-economic status, family history of cervical cancer, women having multiple sexual exposures, high risk male partner and early age at coitus.

**Awareness regarding screening procedures for cervical cancer**

<table>
<thead>
<tr>
<th>Aware of screening procedures</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>35</td>
<td>18%</td>
</tr>
<tr>
<td>No</td>
<td>159</td>
<td>82%</td>
</tr>
</tbody>
</table>
Of the 194 women, 35 (18%) had heard of screening procedures for early detection of cervical cancer while 159(82%) were completely unaware of such screening methods.

**Awareness about the various types of screening methods**

<table>
<thead>
<tr>
<th>Type of screening method</th>
<th>Number of women aware of different types of screening methods (N = 35)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Direct visual</td>
<td>16</td>
<td>45.7%</td>
</tr>
<tr>
<td>inspection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Pap smear</td>
<td>33</td>
<td>94.2%</td>
</tr>
</tbody>
</table>

Of the women who were aware of screening methods for cervical cancer, 45.7% had heard of direct visual inspection and 94.2% had heard of Pap smear (cytological staining and examination) as a screening method for diagnosis of cervical cancer.

None of the women had heard of colposcopy.

**Awareness regarding cervical cancer vaccine**

<table>
<thead>
<tr>
<th>Aware of cervical cancer vaccine</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>No</td>
<td>189</td>
<td>97%</td>
</tr>
</tbody>
</table>
5(3%) out of 194 women were aware or had heard of the HPV vaccine while 189(97%) of them had never heard of it.

Source of Information regarding various aspects of cervical cancer

Source of awareness about various screening methods for cervical cancer

<table>
<thead>
<tr>
<th>Source of awareness regarding screening methods</th>
<th>Number (N=35)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hospital/ Family doctor</td>
<td>32</td>
<td>91%</td>
</tr>
<tr>
<td>2 Friends</td>
<td>8</td>
<td>22.8%</td>
</tr>
<tr>
<td>3 Books/Magazine</td>
<td>5</td>
<td>14.2%</td>
</tr>
<tr>
<td>4 Others</td>
<td>2</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

The most common source of awareness about various screening methods is Hospital/ family doctor (91%), followed by friends (22.8%), books or magazines (14.2%) and others (5.7%) which include media such TV/radio/newspaper and from people who are already having cervical cancer.

Awareness clinics, family members and school played no role as a source of awareness for screening methods.

Citation: Charu Dutt Arora, et al. “Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination

Source of awareness about cervical cancer vaccine

<table>
<thead>
<tr>
<th>Source of awareness about vaccine</th>
<th>Number (N = 5)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Hospital source/ Family doctor</td>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>2 Books/ Magazine</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>3 Media</td>
<td>3</td>
<td>60%</td>
</tr>
</tbody>
</table>

Media i.e., TV/radio/newspaper (60%) played the major role as a source of awareness about the HPV vaccine, followed by books/magazines (40%) and lastly Hospital source/family doctor (20%).

Friends, people having cervical cancer, school, family members and awareness clinics played no role as a source of information for knowledge about the HPV vaccine.

Attitude towards screening methods for cervical cancer

Number of women undergoing cervical cancer screening

<table>
<thead>
<tr>
<th>Type of procedure</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Per vaginal examination</td>
<td>16</td>
<td>8%</td>
</tr>
<tr>
<td>2 Per speculum examination</td>
<td>16</td>
<td>8%</td>
</tr>
<tr>
<td>3 Pap smear</td>
<td>26</td>
<td>13%</td>
</tr>
</tbody>
</table>
Of the women who underwent screening methods for cervical cancer, 13% did a Pap smear, while 8% each underwent per vaginal examination and per speculum examination.

**Reasons for not undergoing cervical cancer screening**

<table>
<thead>
<tr>
<th>Reasons for not undergoing screening</th>
<th>Number (N = 168)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Not aware of the test</td>
<td>78</td>
<td>46.4%</td>
</tr>
<tr>
<td>2 Felt there was no need</td>
<td>77</td>
<td>45.8%</td>
</tr>
<tr>
<td>3 Don’t know where it can be done</td>
<td>17</td>
<td>10.1%</td>
</tr>
<tr>
<td>4 Others</td>
<td>4</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

46.4% of the women not undergoing cervical cancer screening said that they were not aware of the test, 45.8% felt that there was no need to undergo screening since they had no problems/symptoms, 10.1% were unaware of where the test could be taken and 2.3% gave other reasons such as fear of treatment and false beliefs such as loss of virginity, painful procedure, etc.

**Attitude towards usage of cervical cancer vaccine**

**Acceptance towards usage of cervical cancer vaccine**
23 of the women said that they would like to use the HPV vaccine while 171 said that they would not use the vaccine.

**Reasons for using the vaccine**

<table>
<thead>
<tr>
<th>Reasons for using the vaccine</th>
<th>Number (N = 23)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Believing it would prevent the cancer</td>
<td>18</td>
<td>78.3%</td>
</tr>
<tr>
<td>2 Recommended by doctor</td>
<td>5</td>
<td>21.1%</td>
</tr>
<tr>
<td>3 Protecting oneself is important</td>
<td>2</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

78.3% of the women who agreed to use the vaccine said they would do so because they believed that it would prevent the disease, 21.1% would use it on recommendations of a doctor while 8.7% felt that protecting oneself was important.

**Reasons for not using the vaccine**

<table>
<thead>
<tr>
<th>Reasons for not using the vaccine</th>
<th>Number (N = 89)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lack of information about the vaccine</td>
<td>89</td>
<td>100%</td>
</tr>
<tr>
<td>2 Concerns about side effects and safety</td>
<td>54</td>
<td>60.7%</td>
</tr>
<tr>
<td>3 Concerns about effectiveness</td>
<td>17</td>
<td>19.1%</td>
</tr>
<tr>
<td>4 Financial cost</td>
<td>15</td>
<td>17%</td>
</tr>
<tr>
<td>5 Religious and ethnic background</td>
<td>10</td>
<td>11.3%</td>
</tr>
<tr>
<td>6 No need to vaccinate</td>
<td>17</td>
<td>19%</td>
</tr>
<tr>
<td>7 Long term protection not guaranteed</td>
<td>2</td>
<td>2.2%</td>
</tr>
</tbody>
</table>
Reasons for not using the vaccine

<table>
<thead>
<tr>
<th>Reasons for not using the vaccine</th>
<th>Number (N = 171)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Lack of information</td>
<td>89</td>
<td>52%</td>
</tr>
<tr>
<td>2 Concerns about side effects and safety</td>
<td>15</td>
<td>8.7%</td>
</tr>
<tr>
<td>3 Concerns about effectiveness</td>
<td>10</td>
<td>5.8%</td>
</tr>
<tr>
<td>4 Financial Cost</td>
<td>54</td>
<td>31.5%</td>
</tr>
<tr>
<td>5 Religious and ethnic background</td>
<td>17</td>
<td>9.9%</td>
</tr>
<tr>
<td>6 No need to vaccinate</td>
<td>15</td>
<td>8.7%</td>
</tr>
<tr>
<td>7 Long term protection not guaranteed</td>
<td>2</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Reasons given by women for not using the vaccine were as follows:
Lack of information about the vaccine (52%) was the major reason, followed by high cost of vaccine (31.5%), religious and ethnic background (9.9%), concerns about side effects and safety (8.7%), no need to vaccinate (8.7%), concerns about effectiveness (5.8%) and lastly worry that long term protection is not guaranteed (1.1%).

Correlation of socio-economic status with knowledge regarding cervical cancer

Distribution by social class as per Prasad’s modified classification

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Upper High</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 High</td>
<td>11</td>
<td>5.6%</td>
</tr>
<tr>
<td>3 Upper Middle</td>
<td>34</td>
<td>17.5%</td>
</tr>
<tr>
<td>4 Lower Middle</td>
<td>80</td>
<td>41.2%</td>
</tr>
<tr>
<td>5 Poor</td>
<td>58</td>
<td>29.8%</td>
</tr>
<tr>
<td>6 Very poor</td>
<td>11</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

5.6% of the women were classified as High class, 17.5% as Upper Middle, 41.2% as Lower Middle, 29.8% as poor and 5.6% as very poor.

None of the women could be classified under the Upper High class.

Distribution by educational classification

<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Number (N = 194)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Professional</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 Graduate</td>
<td>15</td>
<td>7.7%</td>
</tr>
<tr>
<td>3 Intermediate school (11-12)</td>
<td>35</td>
<td>18%</td>
</tr>
<tr>
<td>4 Secondary school (5-10)</td>
<td>74</td>
<td>38.1%</td>
</tr>
<tr>
<td>5 Primary school (1-4)</td>
<td>28</td>
<td>14.4%</td>
</tr>
<tr>
<td>6 Illiterate</td>
<td>42</td>
<td>21.6%</td>
</tr>
</tbody>
</table>

7.7% of the sample size are graduates, 18% are educated up to the 12th standard (Intermediate level), 38.1% up to the 10th standard (Secondary level), 14%, 4% up to the 4th standard (Primary level) and 21.6% are illiterate.

None of the women were educated up to the Professional level.
Correlation between social class and awareness regarding cervical cancer

<table>
<thead>
<tr>
<th>Social class</th>
<th>Aware of cervical cancer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1 High</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>2 Upper Middle</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>3 Lower Middle</td>
<td>23</td>
<td>57</td>
</tr>
<tr>
<td>4 Poor</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>5 Very poor</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>145</td>
</tr>
</tbody>
</table>

For the above data, applying Chi-square test, Chi square value = 13.9, degrees of freedom = 4, P value = 0.05, and hence data is statistically significant.

36.3% of the women belonging to High class, 79.4% to Upper Middle, 71.25% to Lower Middle, 79.3% to Poor and 100% to Very Poor Class were NOT aware of cervical cancer or had never heard of cervical cancer.

Correlation between education and level of awareness regarding cervical cancer

**Citation:** Charu Dutt Arora., et al.”Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. *EC Gastroenterology and Digestive System* 2.3 (2017): 331-368.
<table>
<thead>
<tr>
<th>Educational level</th>
<th>Aware of cervical cancer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>1 Graduate</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>2 Intermediate school (11-12)</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>3 Secondary school (5-10)</td>
<td>23</td>
<td>51</td>
</tr>
<tr>
<td>4 Primary school (1-4)</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>5 Illiterate</td>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>145</td>
</tr>
</tbody>
</table>

For the above data, applying Chi-square test, Chi square = 51.9, degrees of freedom = 4, P value = 0.05, and hence data is statistically significant.

13.3% of the women who were graduates, 68.5% who were educated up to intermediate level, 68.9% up to secondary level, 100% up to primary level, and 95.2% who were illiterate were NOT aware of cervical cancer.

Discussion

This study was designed with the intention of finding out the knowledge and awareness regarding cervical cancer with respect to awareness about HPV infection and cervical cancer, other risk factors, screening methods, types of screening methods and HPV vaccination. The study also tried to find out the source of awareness regarding various screening methods and vaccination as well as the attitude towards screening for cancer and the acceptance towards the usage of cervical cancer vaccine. Lastly the study also correlated the social class and education with the awareness about cervical cancer.

It was found that majority of the women showed poor knowledge and complete lack of awareness about cervical cancer, thus implying that there is an urgent need to use health education as a mean to increase knowledge about this sensitive topic.

Awareness about cervical cancer

This survey, conducted in the OPD of B.Y.L.Nair Hospital and Topiwala National Medical College showed that of the 194 women who interviewed, 25% of them were aware of cervical cancer while 75% were not.

In a survey conducted in Kolkata in a gynecology clinic, 84% women stated that they had no knowledge of cervical cancer [20].

A study conducted by Hoque ME in a South African University showed that 33% of the participants had heard of cervical cancer [11].

Contrasting to the above findings is the study conducted in a university among young Dutch adults whereby 94% of the participants were aware of cervical cancer [25].

In our survey I had expected the findings to be almost equal to that of the Kolkata survey. However; error due to observer variation may have led to the results obtained. The positive response given by the participants on hearing the word CANCER, than actually being aware of cervical cancer may possibly be the reason for the above results of the survey.

Citation: Charu Dutt Arora., et al. ”Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
Awareness about HPV and cervical cancer

While 12% women said they had heard of viral infection of the cervix, only 6% were aware that HPV causes cervical cancer. Only 9% of the women had heard that HPV is sexually transmitted.

Now let us compare these results with results from other surveys.

<table>
<thead>
<tr>
<th>Studies conducted</th>
<th>Region</th>
<th>Aware of HPV</th>
<th>Aware of link between HPV and cervical cancer</th>
<th>Aware that HPV is Sexually transmitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shokar NK., et al. [19]</td>
<td>Ghana (college students)</td>
<td>-</td>
<td>7.9%</td>
<td>-</td>
</tr>
<tr>
<td>Do H., et al. [21]</td>
<td>Cambodia (American parents and community leaders)</td>
<td>Limited knowledge about HPV</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dursun P., et al. [17]</td>
<td>Turkish women</td>
<td>45%</td>
<td>40%</td>
<td>-</td>
</tr>
<tr>
<td>Abbate R., et al. [29]</td>
<td>Women in Italy</td>
<td>23.3%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hoque., et al. [11]</td>
<td>South African (University students)</td>
<td>32%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Franco EL., et al. [22]</td>
<td>Quebec, Canada</td>
<td>31%</td>
<td>53%</td>
<td>-</td>
</tr>
<tr>
<td>Lenselink CH., et al. [25]</td>
<td>Yound Dutch adults</td>
<td>17.7%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sait KH., et al. [26]</td>
<td>Women of Saudi Arabia</td>
<td>-</td>
<td>14.4%</td>
<td>-</td>
</tr>
<tr>
<td>Pitts MK., et al. [26]</td>
<td>Women in Australia</td>
<td>62.8%</td>
<td>66%</td>
<td>-</td>
</tr>
<tr>
<td>Our study</td>
<td>Women in gynecology clinic in Mumbai</td>
<td>12%</td>
<td>6%</td>
<td>9%</td>
</tr>
</tbody>
</table>

In a study conducted by Shokar NK., et al. among college students in Ghana, only 7.9% were aware of the link between HPV and cervical cancer [19].

Similarly a Cambodian study stated that the participants had very limited knowledge about HPV infection [21].

This is similar to our survey findings, reflecting the poor knowledge among women of developing countries.

In a study titled "Women's knowledge about HPV and acceptance of vaccine" among Turkish women, 45% of the participants having abnormal Pap test had heard of HPV while 55% of them had absolutely no knowledge of it. Of the parents, 40% knew HPV is related to cervical cancer, while 34% had no opinion on the subject [17].

An Italian study conducted by Angelillo., et al showed that only 23.3% of women have heard of HPV infection of the genital mucosa and about cervical cancer [29].

In a South African study conducted by Hoque., et al. 32% women who had heard of cervical cancer knew about HPV virus [11].

In Franco EL’s study in Canada, Quebec, 31% women reported that they had heard of HPV and 53% knew that HPV causes cervical cancer. The level of awareness was not found to vary with participant’s age. The awareness of HPV was found to be associated with greater or equal to 13 years of education and knowing someone with cervical cancer [22].

In a study among young Dutch adults, 17.7% of the participants were aware of Human papillomavirus [25].

Citation: Charu Dutt Arora., et al."Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. *EC Gastroenterology and Digestive System* 2.3 (2017): 331-368.
In Saudi Arabia, Sait KH in his study found out that only 14.4% women were aware of HPV as an etiological agent for cervical cancer [26].

In a study among Australian women, 62.8% women had heard of HPV and of these 66% correctly answered that HPV is associated with cervical cancer [30].

This particularly reflects the differing scenario in the developed nations where there is higher level of awareness due to higher literacy rates. However, some of the developed countries also showed lower level of awareness about HPV.

The findings in our survey are as expected and are also similar to those of the Ghana study [19], reflecting that lack of knowledge among women of developing countries as compared to their developed counterparts. The reasons for these differences were low literacy levels, poverty, low standards of living, low socioeconomic status, ignorance, lack of sex education in school, etc.

**Awareness about other risk factors**

Of the 194 women who consented to be a part of the study, only 4% women said that they had heard of other risk factors for cervical cancer. The other causative factors asked for in the survey include smoking, immunosuppression, Chlamydia infection, OCPs, multiple full term pregnancies, young age at first full term pregnancy, poverty/low socioeconomic status, family history of cervical cancer, women having multiple sexual exposures, high risk male partner and early age at coitus.

In study among Turkish women, 77% women believed that sex education should be provided at the school level so as to reduce the incidence of cervical cancer [17].

In a study conducted among a South African University, 26% knew about multiple sexual partners as a risk factor for cervical cancer. Participants were twice more likely to use condoms if they had heard of cervical cancer [11].

Thus, it can be concluded that the participants of our survey lack awareness about risk factors for cervical cancer when compared with participants of developed countries. Sex education at school level, as pointed out in the survey among Turkish women can be used as a means to increase awareness about various risk factors and measures to prevent them.

**Awareness regarding various screening methods for cervical cancer**

18% women stated that they were aware of screening procedures for cervical cancer while 82% stated that they were not aware.

Of the women who were aware of screening methods for cervical cancer, 45.7% were aware of direct visual inspection which include per speculum and per vaginal examination while 94.2% were aware of Pap smear testing. None of the women had heard of colposcopy.

<table>
<thead>
<tr>
<th>Studies conducted</th>
<th>Region</th>
<th>Aware of screening methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roy B., et al. [20]</td>
<td>Women in a gynecology clinic in Kolkata</td>
<td>5% (Pap Test)</td>
</tr>
<tr>
<td>Shokar NK., et al. [19]</td>
<td>College women in Ghana</td>
<td>Unaware of local screening initiatives</td>
</tr>
<tr>
<td>Ezem BU [18]</td>
<td>Nigeria</td>
<td>52.8%</td>
</tr>
<tr>
<td>Celik A., et al. [31]</td>
<td>Women in Islamic society in Turkey</td>
<td>70%</td>
</tr>
<tr>
<td>Sait KH [26]</td>
<td>Women in Saudi Arabia</td>
<td>67.6%(Pap test)</td>
</tr>
<tr>
<td>Our study</td>
<td>Women in gynecology clinic in Mumbai</td>
<td>18%</td>
</tr>
</tbody>
</table>

Roy B and Tang S conducted a study in a gynecology clinic in Kolkata where they found that 95% women had no knowledge about the Pap test. Findings suggested a need to increase cervical cancer awareness and to develop community based screening programmes [20].

Citation: Charu Dutt Arora., et al. “Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination

The Ghana study, which was a cross-sectional survey among college women, stated that women were unaware of local screening initiatives [19].

Contrasting to the above findings are those of the study conducted in Nigeria where 52.8% women were aware of cervical cancer screening [18].

In study conducted in a South African university, 31% participants had heard of the Pap smear test and among them a third (33%) knew that Pap smear is used for detection or prevention of cervical cancer [11].

In a survey amongst an Islamic society, the knowledge of cervical screening was high (70%) [31].

In Saudi Arabia, in a survey conducted among the women, 67.6% of the respondents were aware of the Pap smear test [26].

A survey was conducted in the Alipur PHC field practice area of MAMC where it was found that while 24.8% of the acceptors (those who were informed about cervical cancer; those who reported gynecological problems, and those who sought treatment) knew about methods of early detection of cervical cancer; only 3.7% of the non-acceptors were aware of the screening methods [23].

This tells us that people avail of health care facilities and become aware of certain diagnostic modalities (in this case screening) only after they experience some illness or some disturbing symptoms which bring them to the hospital. Also health education plays a key role in increasing awareness about screening. This explains the difference between acceptors and non-acceptors.

While the Kolkata [20] and MAMC [23] surveys were conducted in a gynecology clinic and PHC field practice area respectively, the other surveys were conducted among young university students. The type of population interviewed in our survey and the two Indian surveys are similar and so the suggestions made by the two Indian surveys of increasing awareness by using health education hold great importance.

Awareness about HPV vaccine

97% of the women said that they had no knowledge about the HPV vaccine.

<table>
<thead>
<tr>
<th>Studies conducted</th>
<th>Region</th>
<th>Aware of HPV vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do H., et al. [21]</td>
<td>Cambodia (American parents and community leaders)</td>
<td>Limited knowledge</td>
</tr>
<tr>
<td>Chelimo C., et al. [32]</td>
<td>Undergraduates in healthcare training in New Zealand</td>
<td>Compared to 19 year olds, an 18 year old is more likely to have heard of HPV vaccine.</td>
</tr>
<tr>
<td>Cates JR., et al. [33]</td>
<td>North Carolina residents</td>
<td>91%</td>
</tr>
<tr>
<td>Chapman E., et al. [34]</td>
<td>Pilot study</td>
<td>65% knew, prior to watching the video about the HPV vaccine.</td>
</tr>
<tr>
<td>Lim MK., et al. [35]</td>
<td>Women in Korea</td>
<td>8.6%</td>
</tr>
<tr>
<td>Gottvall M., et al. [36]</td>
<td>Swedish upper secondary school students</td>
<td>6%</td>
</tr>
<tr>
<td>Sait KH [26]</td>
<td>Women in Saudi Arabia</td>
<td>9.8%</td>
</tr>
<tr>
<td>Our study</td>
<td>Women in gynecology clinic in Mumbai</td>
<td>3%</td>
</tr>
</tbody>
</table>

The study conducted in Cambodia stated that participants had very limited knowledge about the HPV vaccine [21] which is very similar to the findings of our study.

A study in a New Zealand University stated that compared to 19 year olds, an 18 year old is more likely to have heard of HPV vaccine [32].

Citation: Charu Dutt Arora., et al. “Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. EC Gastroenterology and Digestive System 2.3 (2017): 331-368.
In a study amongst North Carolina residents [33], 91% of parents had heard of HPV vaccine.

In a pilot study for HPV vaccine acceptability, 65% knew, prior to watching the video about the HPV vaccine [34].

In a study in Korea, only 8.6% women knew of the preventive effects of HPV vaccination [35].

In a survey among Swedish upper secondary students, only 6% were aware of HPV vaccine [36].

Sait KH found out that only 9.8% of the respondents were aware of HPV vaccination [26].

Awareness about the HPV vaccine was generally low. This calls for urgent need to increase awareness about the same.

**Source of awareness about various screening methods**

Here it was found that the most important source of awareness for various screening methods was Hospitals/ Family doctor (91%), followed by friends (22.8%), books or magazines (14.2%) and others (5.7%) which include media such as T.V./radio/newspaper and from people who already have cervical cancer.

Awareness clinics, family members and school (education) played no role as a source of awareness for screening methods.

This is similar to the study by Ezem Bu. in Nigeria, where the major source of information about cervical smear testing was hospital/health facilities (31%) and friends (30.9%) [18].

In the Alipur study, it was found that acceptors (those who were informed about cervical cancer, those who reported gynaecological problems, those who sought treatment) had obtained information about cervical cancer (early detection methods) from hospital source and media while non acceptors from relatives, neighbours and friends [23].

This data is very useful as it tells us that most women receive their advice for screening for cervical cancer detection from medical personnel. While interviewing participants for our study I realised that many of them had undergone a Pap smear without actually knowing what it is or what it was done for. If doctors spend a few minutes with each patient providing counselling about the various screening methods and the importance of taking such tests then there would be a drastic improvement in the level of awareness about various screening methods and may even voluntarily undergo screening.

**Source of awareness about HPV vaccine**

Media i.e., TV/radio/newspaper (60%) played the major role as a source of awareness about the HPV vaccine, followed by books/magazines (40%) and lastly Hospital source/family doctor (20%).

Friends, people having cervical cancer, school, family members and awareness clinics played no role as a source of information for knowledge about the HPV vaccine.

Contrasting to this is the Study amongst university students in New Zealand where it was found that participants who knew someone ever diagnosed with cervical cancer were more likely to have ever heard of HPV vaccine [32].

In a study among North Carolina residents, parents were more likely to be aware if they had higher household incomes, were women, or had daughters vaccinated against meningitis. Information sources included drug advertisements (64%), healthcare providers (50%), news stories (50%) and schools (9%). Only parents who had heard from their children’s healthcare providers were more likely to vaccinate their daughters [33].

While in our study, media, books and magazines played a major role as a source of awareness for HPV vaccine, in other countries health care provider played a major role. Thus, doctors should play a positive role and spread awareness about HPV vaccine.

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**Citation:** Charu Dutt Arora, et al. “Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. *EC Gastroenterology and Digestive System* 2.3 (2017): 331-368.
Attitude towards screening methods

Number of women undergoing screening

Of the women who underwent screening methods for detection of cervical cancer, 13% underwent Pap smear testing while 8% each underwent per vaginal examination and per speculum examination.

<table>
<thead>
<tr>
<th>Studies conducted</th>
<th>Region</th>
<th>Number of women undergoing screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shokar NK., et al. [19]</td>
<td>College women in Ghana</td>
<td>12% (Pap test)</td>
</tr>
<tr>
<td>Ezem BU [18]</td>
<td>Nigeria</td>
<td>7.1%</td>
</tr>
<tr>
<td>Celik A., et al. [31]</td>
<td>Women in Islamic society in Turkey</td>
<td>51% (Pap test)</td>
</tr>
<tr>
<td>Sait KH [26]</td>
<td>Women in Saudi Arabia</td>
<td>16.8% (Pap test)</td>
</tr>
<tr>
<td>Our study</td>
<td>Women in a gynecology clinic in Mumbai</td>
<td>13% (Pap test), 8% (per vaginal examination), 8% (per speculum examination)</td>
</tr>
</tbody>
</table>

This is similar to the Kolkata survey in a gynaecological clinic where a total of 10% had received a Pap test at least once [20].

Ezem Bu, in his survey stated that 7.1% of the participants had done the test for cervical screening [18].

Shokar NK. in his study in Ghana found out that the prior Pap screening rate was 12%, which is also very similar to our survey [19].

In a survey conducted among patients of cervical cancer from 8 hospitals in Malaysia, most of them had not had a Pap smear within 3 years before cancer development. The percentages of patients who had a Pap smear ranged from 0 - 12%. 56.3% had none or only primary education and 61.1% had a household income of RM 1,000 or less. Level of education and the household income were strongly associated (p < 0.05) with knowledge and having had a Pap test [24].

In a study amongst Islamic women in Turkey, 51% of the subjects had had a Pap smear test at least once [31].

In a study in Saudi Arabia, 16.8% of the women had taken the Pap test [26].

Thus, it can be seen that the number of women undergoing screening as per our study is low. This low screening rate reflects the lack of awareness about various screening methods.

While conducting the survey, I realized that although many of the women had undergone a Pap smear test, they were not aware of it or for what it was done. If medical personnel spent a few extra minutes explaining to the women the nature and importance of these tests, it would automatically increase the awareness and screening rates.

Reasons for not undergoing screening

46.4% of the women not undergoing cervical cancer screening said that they were not aware of the test, 45.8% felt that there was no need to undergo screening since they had no problems/symptoms, 10.1% were unaware of where the test could be taken and 2.3% gave other reasons such as fear of treatment and false beliefs such as loss of virginity, painful procedure, etc.

Ezem Bu [18] in a study conducted in Nigeria stated that the most common reason for not doing the test were lack of awareness (46.1%), no need for it (12.5%) and fear of a bad result (11.6%). This it was concluded that level of awareness of cervical screening is low and a national cervical smear screening policy was advocated along with greater public education. This is very similar to our survey findings reflecting the similar thought process, attitudes and awareness of the women about cervical cancer screening methods. The recommendations made in the above study can be adopted for our study as well.

Citation: Charu Dutt Arora., et al. “Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination”. *EC Gastroenterology and Digestive System* 2.3 (2017): 331-368.
In a survey conducted in Ghana [19], it was seen that the most prevalent barriers were lack of information on how to obtain screening services. Although women perceived the benefits of screening, about half perceived themselves to be at risk. Other barriers were lack of belief that the cancer is diagnosed by screening, belief that Pap test is painful, and belief that the test will take away virginity.

In our study, as well, many of the women did not perceive themselves to be at risk and so felt that there was no need for such tests. They also felt that if they had no symptoms or difficulties there was no need to do the tests. Such barriers and wrong beliefs have to be overcome. Public education which can be given to the women by health care provider in the OPD itself is the answer to such problems.

In a survey amongst 8 hospitals in Malaysia, the main reasons cited for not having had a Pap smear were “Never heard about it” (36.2%), “Shy” (10.4%), “Afraid to do it” (13.1%), “Think the test is not important” (8.1%) and “No encouragement from family” (4.5%). A large majority (95.9%) of the patients did not know the optimal interval. In conclusion, a large number of cervical cancer patients had not had a Pap smear within 3 years preceding cancer development and most had inadequate knowledge about this screening test [24].

Thus, to conclude it is the attitudes of people towards screening that calls for a change. This can be achieved by developing new policies and greater public education. The health care provider should spend some extra time and explain to the women the nature and importance of screening methods. This will go a long way in changing the attitude towards screening.

**Attitude towards usage of HPV vaccine**

12% of the women agreed to use the HPV vaccine while 88% women were against the use of such a vaccine.

**Reasons for using the vaccine:** 78.3% of the women who agreed to use the vaccine said they would do so because they believed that it would prevent the disease, 21.1% would use it on the recommendations of a doctor while 8.7% felt that protecting oneself was important.

**Reasons for not using the vaccine:** Lack of information about the vaccine (52%) was the major reason, followed by high cost of vaccine (31.5%), religious and ethnic background (9.9%), concerns about side effects and safety (8.7%), no need to vaccinate (8.7%), concerns about effectiveness (5.8%) and lastly worry that long term protection is not guaranteed (1.1%).

Similar to our study is a study conducted in Cambodia [21] where participants had limited knowledge about HPV infection and vaccination. Barriers to HPV vaccination were lack of information about the vaccine, as well as concerns about vaccine safety, effectiveness, and financial costs. The most important facilitators were a health care provider recommendation for vaccination and believing in the importance of disease prevention.

Contrasting to the above findings were those of the study by Lenselink CH., et al [16]. Results showed that HPV vaccination would be accepted by 88% of the parents, preferably when the child is aged 10 - 12 years. Parents of children who received all the vaccinations of the National Vaccination Programme accepted HPV vaccination significantly more. Knowledge of HPV and cervical cancer, religion, age, education, and marital status did not show any significant relation with HPV vaccine acceptance. Thus, it was concluded that a majority of the parents would accept HPV vaccination. HPV vaccine acceptance seems to be dependent on vaccine acceptance in general, even more than on knowledge of HPV and its causal relation with cervical cancer. However, parents requested more information about cervical cancer, HPV, and HPV vaccination, before the HPV vaccine is introduced.

Thus, patients would be willing to try out HPV vaccination if they were well informed about it. This can be extended to our study since the major reason for not using HPV vaccine was lack of information about it. Also, as seen from the above study, HPV vaccine acceptance was dependant on general vaccine acceptance. Thus, HPV vaccination could be introduced in National vaccination programmes to make it more acceptable with due consideration to the cost benefit ratio.

In a study among Turkish women, 70% reported that they would use HPV vaccination for themselves and 64% agreed to use it for their daughters [17].

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Similar to our study is a study conducted in Cambodia where participants had limited knowledge about HPV infection and vaccination. Barriers to HPV vaccination were lack of information about the vaccine, as well as concerns about vaccine safety, effectiveness, and financial costs. The most important facilitators were a health care provider recommendation for vaccination and believing in the importance of disease prevention [21].

Hsu YY, Hsu KF., et al. in their study amongst Taiwanese women found out that recommendations from others (family, health care providers, etc.) are among the main reasons for young adult women to initiate HPV vaccination; while self-awareness of the risk for HPV infection and personal gynaecologic diseases are main reasons for adult women to initiate HPV vaccination. Furthermore, women aged 18-26 are more likely than women aged over 26 to consider the cost and availability of vaccination. Media also plays an important role in a woman’s decision to seek HPV vaccination [27].

In a study among Korean women, although awareness about HPV infection and HPV vaccine was low, willingness to vaccinate against HPV (55.0%) was relatively high, especially with regard to participants’ daughters (77.0%). Those who were informed about HPV infection or vaccination, or who perceived a susceptibility to HPV infection were more accepting of vaccination than those who did not. Appropriate knowledge transfer, guidance from a health professional, and reductions in the cost of the vaccine are key issues in promoting awareness of HPV infection and vaccination for cervical cancer prevention [35].

Angelillo., et al [29] in their study in Italy found out that the vast majority professed intent to receive HPV vaccine and the significant predictors were having at least one parent who is a health care professional, a high perceived risk of contracting HPV infection and of developing cervical cancer; and a high belief towards the utility of a vaccination for preventing cervical cancer. This reflects the differing attitudes of the women towards vaccination. In our study, women had very limited knowledge about HPV and its relation to cervical cancer and also did not believe that they were at risk. So, they were less willing to accept HPV vaccination unlike the Italian women who were intent to receive the vaccine.

In a study amongst young Dutch adults, 61% of the female participants were willing to accept a ‘catch-up’ HPV vaccination. Women and younger participants were significantly more willing to accept HPV vaccination. However, in these subgroups, acceptance of HPV vaccination seems to be affected by other, still unidentified, factors. These factors could be evaluated in a more qualitative orientated study. An educational campaign is needed to cover knowledge about HPV and cervical carcinoma, and beliefs and behaviours associated with the acceptance of vaccination [25]. This can also be used in our study where an educational campaign can be used to increase awareness and change attitudes of the women.

In a study amongst North Carolina women, parents were more likely to vaccinate their daughters on recommendations of a health care provider [33].

In a pilot study to assess the acceptability to HPV vaccination, individual vaccine acceptability increased from 66.7% to 78.0% after the video. Prior to the video, 54.8% of subjects supported mandatory HPV vaccination, with 51.1% supporting school vaccination, and 66.7% accepting vaccination if it were free. After the video, these percentages increased to 72.6%, 65.1% and 86.6% respectively. Initially, 56.5% of subjects would vaccinate their child at 15 years of age or younger. After the video, 94.1% approved of vaccination from age [34].

In a study among high risk populations in the US, possible barriers to HPV vaccination included access to healthcare, cultural beliefs and limited awareness of treatment options [37].

In a survey among students of a Swedish school, as many as 84% would like to be vaccinated against HPV. The major obstacles were high cost (37%), fear of needles (19%). Before considering vaccination, 73% wanted more information and 36% would want this information from a school nurse [36].

In a study by Celik A., et al. women stated that recommendation by a health care provider (67%) was the major influence in getting vaccinated. The importance of successful introduction on the vaccine by the drug providers and health care professionals in Turkey was

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shown in this present study with a high rate of awareness of cervical cancer vaccine. "Early-age vaccination knowledge" before any sexual contact is probably due to the correct education of mothers by health care professionals. The professionals should be educated and trained about HPV, vaccination, and its relation with cervical cancer to increase the knowledge about it [31].

Sankaranaranyan R found out that in developing countries widespread implementation of HPV vaccination programs are challenged by the unaffordable high costs of the vaccines and the lack of effective vaccine delivery platforms for sexually naïve girls. Other unresolved issues include long-term protection, cross-protection against HPV types not included in the vaccine and whether booster doses will be needed. Sensitivities associated with a vaccine preventing a sexually transmitted infection in girls, lack of awareness, public demand and political will, lack of coordination between cancer control, sexual and reproductive health and vaccine delivery services are additional challenges. Reduced costs, simple vaccine regimes and strengthening vaccine delivery platforms for adolescents should eventually facilitate HPV vaccine introduction in developing countries [38].

In yet another study for countries with low resource settings, understanding of cervical cancer and HPV was limited; however, the gravity of cancer and some symptoms of cervical cancer were recognized. Vaccination and government-sponsored immunization programs were generally supported by respondents. Sentiments toward cervical cancer vaccines were positive, but concerns about quality of delivery, safety, adverse effects, and the effect on fertility were raised. Communities requested comprehensive awareness-raising and health education to address these concerns [39].

Thus, while many of the women from nations were willing to try the vaccine, it was seen from our survey that the women were still hesitant in using the vaccine. This is mainly due to lack of knowledge and awareness about cervical cancer, HPV and the vaccine. Health care provider plays a major role in increasing awareness and positive response towards vaccination, as seen by other studies. Also, socio-cultural and sexual behavioural patterns influence the usage of the vaccine. Further research and comparisons would reveal the effect of such influences on vaccination.

**Correlation of socio-economic status with knowledge regarding cervical cancer**

On correlating with social class, we found that 36.3% of the women belonging to High class, 79.4% to Upper Middle, 71.25% to Lower Middle, 79.3% to Poor and 100% to Very Poor Class were NOT aware of cervical cancer or had never heard of cervical cancer.

This data is statistically significant, thus proving our hypothesis that increasing social class is associated with increased knowledge about cervical cancer.

On correlating with educational status, 13.3% of the women who were graduates, 68.5% who were educated up to intermediate level, 68.9% up to secondary level, 100% up to primary level, and 95.2% who were illiterate were NOT aware of cervical cancer.

Once again, our hypothesis is proved that increasing education is associated with increased knowledge about cervical cancer.

In our study, there was unequal distribution of women among various social classes and according to their educational level. Thus, we would like to conduct a further extensive study with equitable distribution of women among all social classes and according to their educational level.

**Conclusion**

**Aware of cervical cancer**

It was found that one-fourth of the women were aware of cervical cancer. This reflects a low level of knowledge and awareness about cervical cancer.

**Aware of HPV**

During the course of the study, we found that while a few women had heard of viral infection of the cervix, only a small portion of them...
knew of the causative link between HPV and cervical cancer and of HPV being sexually transmitted. Thus, we conclude that the level of awareness about HPV is extremely low and calls for immediate use of health education as a means to increase knowledge about the same.

**Aware of other risk others**

Just as knowledge about HPV was found to be very low, so also the awareness about other risk factors like smoking, OCP's, high-risk sexual behaviour etc. responsible for causing cervical cancer was found to be extremely poor. Indian women should be educated and taught about preventive measures to decrease the incidence of cervical cancer.

**Aware of screening methods**

It was found that Indian women had limited knowledge about screening methods for the diagnosis of cervical cancer, with less than one-fifth of the women being aware of the same. Of the women who had heard of various screening procedures, most of them knew about the Pap smear test and few were aware of the direct visual inspection method. None of the women had ever heard about colposcopy.

**Aware of HPV vaccine**

Indian women have almost limited to no knowledge about the HPV vaccine. This is unlike the Western countries where most of the women had more knowledge about HPV vaccination.

**Source of awareness regarding screening methods**

The most common source of awareness for screening methods is a Hospital/Family doctor. Friends and books/magazines also play a significant role, followed by media and people already having cervical cancer who have minor contributions. Thus, if the health care provider can spend a few extra minutes explaining to the patient about screening, it would go miles in increasing the awareness and help prevent cervical cancer.

**Source of awareness regarding HPV vaccine**

While media played the major role as a source of awareness for HPV vaccine, magazines/books and Hospital/Family doctor were relatively less important sources. This is contrasting to other studies where the health care provider played a pivotal role as a source of awareness for the HPV vaccine.

**Attitude towards screening/ screening rates**

While the Pap smear screening rates were found to be low, the rates for per vaginal and per speculum examination were found to be even lower. The health care provider should play a key role in changing the outlook towards screening and help increase screening rates.

**Reasons for not undergoing screening**

It was found that most women did not undergo screening because they were not aware about the test or they felt there was no need to take the test. Other minor reasons given were lack of knowledge about where the test could be done, fear of treatment and false beliefs. It is only by increasing awareness that we can overcome these barriers and bring about a positive attitude towards screening.

**Acceptance towards usage of HPV vaccine**

While a few women agreed to use the HPV vaccine, a large majority of them refused vaccination. It is interesting to note that most women in Western countries prefer to take vaccination for themselves and for their daughters. This could be simply due to their increased awareness about the subject which is something that we should try to emulate in our country.

**Reasons for using HPV vaccine**

According to this study, the most important facilitator for HPV vaccination was believing that it would prevent the disease, followed by recommendation by a doctor and lastly believing that protecting oneself is important. This differs from other studies, where again doctors play the key role, thus highlighting the important role they play in increasing awareness about this topic.

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**Citation:** Charu Dutt Arora, *et al.* "Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination". *EC Gastroenterology and Digestive System* 2.3 (2017): 331-368.
Reasons for not using HPV vaccine

The most important barrier towards HPV vaccination as expressed by Indian women was lack of information about vaccine, followed by financial cost, religious and ethnic background, concerns about side effects and safety, no need to vaccinate, concerns about effectiveness and lastly worry that long term protection is not guaranteed.

Correlation of social class and education with awareness about cervical cancer

On correlation with social class and educational status, it was seen that women of higher social class and greater education had more knowledge about cervical cancer as compared to those of lower social class/educational level. However, we would like to conduct a further extensive study with equitable distribution of women among various social classes and levels of education.

Summary

Objective
1) To determine the knowledge and level of awareness regarding cervical cancer with respect to risk factor, screening methods and vaccination.
2) To find out the source of information for screening methods and vaccination and to investigate the attitude of women towards screening and vaccination.

Methodology

A self-constructed semi-structured questionnaire was administered to all the women. The questionnaire was designed to measure the knowledge and awareness and the attitude of the women towards cervical cancer. A cross-sectional interview of 194 Indian women coming to the O.P.D of Nair Hospital was conducted using the semi-structured questionnaire and was analysed statistically.

Results
1. 25% women had heard of cervical cancer as per this study.
2. 12% of the women had heard of viral infection of the cervix, 6% were aware that HPV causes cervical cancer while 9% were aware that HPV is sexually transmitted.
3. 4% of the women had heard about other risk factors responsible in the causation of cervical cancer.
4. 18% of the women were aware of screening procedures for early detection of cervical cancer.
5. Of the women, aware of screening methods for detection of cervical cancer, 45.7% had heard of direct visual inspection while 94.2% knew about the Pap smear test.
6. Only 3% of the women were aware of the HPV vaccine.
7. The most common source of awareness for screening for detection of cervical cancer is from Hospital/family doctor (91%), followed by friends (22.8%), books or magazines (14.2%), and others-media and from person having cervical cancer (5.7%).
8. The most common source of awareness for the HPV vaccine is from media (60%), followed by books/magazines (40%), and lastly hospital/family doctor (20%).
9. 13% women had undergone a Pap smear test, 8% of the women had done a per vaginal examination and another 8% had undergone a per speculum examination as a part of the screening procedures for cervical cancer detection.
Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination

10. 46.4% of the women not undergoing cervical cancer screening said that they were not aware of the test, 45.8% felt that there was no need to undergo screening since they had no problems/symptoms, 10.1% were unaware of where the test could be taken and 2.3% gave other reasons such as fear of treatment and false beliefs such as loss of virginity, painful procedure, etc.

11. 12% of the women agreed to use the HPV vaccine.

12. The most common reason cited for using the vaccine was believing it would prevent the disease (78.3%), followed by recommendation of a health care provider (21.1%), and 8.7% felt that protecting oneself was important.

13. 52% of the women said that lack of information was the major reason for not using the vaccine, followed by high cost of vaccine (31.5%), religious and ethnic background (9.9%), concerns about side effects and safety (8.7%), no need to vaccinate (8.7%), concerns about effectiveness (5.8%) and lastly worry that long term protection is not guaranteed (1.1%).

14. 36.3% of the women belonging to High class, 79.4% to Upper Middle, 71.25% to Lower Middle, 79.3% to Poor and 100% to Very Poor Class were NOT aware of cervical cancer or had never heard of cervical cancer.

15. 13.3% of the women who were graduates, 68.5% who were educated up to intermediate level, 68.9% up to secondary level, 100% up to primary level, and 95.2% who were illiterate were NOT aware of cervical cancer.

Conclusion

The level of awareness about cervical cancer with respect to risk factors, screening methods and vaccination is low. The screening rates and acceptance to the HPV vaccine is also low. The battle against cervical cancer is a long and unending one and it can be overcome with only one tool- KNOWLEDGE. Increasing the level of awareness amongst women by health education is the only means of reducing the disease burden in our country.

Questionnaire

Questionnaire on Knowledge and Awareness regarding cervical cancer in women with respect to risk factors, screening methods and vaccination

Proforma No.__________

Demographic Details

1. Age- ____________
2. Resident of-_______ Community-_______
3. Marital status- Single/ Married/ Divorced/ Widow
4. Sexually active- Yes/ No
5. Number of children- Gravid/ Parous/ Aborted/ Living
6. Education
   • Professional
   • Graduate
   • Intermediate or Higher Secondary School (Std. 11-12)
   • Secondary School (Std. 5-10)
   • Primary school (Std. 1-4)
   • Illiterate
7. Occupation
   • Professional

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Knowledge and Awareness Regarding Cervical Cancer in Women with Respect to Risk Factors, Screening Methods and Vaccination

- Self-employed or businesswoman
- Skilled worker
- Semi-skilled worker
- Unskilled worker
- Unemployed
- Housewife

8. What is the total monthly income of your family? ________

9. How many people are there in your family over 10?

10. How many children are there in your family between 1 to 9 years? How many infants are below 12 months?

11. Calculated per capita Income: ________

12. What is the per capita Income (Rs. per Month) of your family?
   - 10,000 and above (I) Upper High
   - 5,000-9,999 (II) High
   - 3,000-4,999 (III) Upper Middle
   - 1,500-2,999 (IV) Lower Middle
   - 500-1,499 (V) Poor
   - Below 500 (VI) Very Poor or Below Poverty Line

Therefore, Class of subject as per modified Prasad Classification is: ________

1. Have you heard about cervical cancer? Yes/ No

2. Have you heard of HPV (Human Papillomavirus) / viral infection of Cervix? Yes/ No

3. If yes,
   a. Are you aware that HPV causes Cervical cancer? Yes/ No
   b. Do you have knowledge of the fact that HPV is sexually transmitted? Yes/ No

4. A. Are you aware of other risk factors for Cervical cancer? Yes/ No
   B. If yes, which of the following have you heard of?
      1. Smoking
      2. Immunosuppression (HIV)
      3. Chlamydia infection
      4. OCP (Oral contraceptive pills)/ Hormonal contraception.
      5. Multiple full term pregnancies
      6. Young age at first full-term pregnancy
      7. Poverty/Low socio-economic status
      8. Family history of cervical cancer
      9. Diet (Low in fruits and vegetables)
      10. High risk male partner
      11. Women having multiple exposures
      12. Early age at coitus

5. A. Are you aware of various screening procedures for cervical cancer? Yes/ No
   B. If yes, which procedure have you heard of?
      1. Direct visual inspection
      2. Pap smear
      3. Colposcopy

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4. Others (Please specify______)

C. If yes, what is your source of information?
   1. Hospital source/Family doctor
   2. Friends
   3. Books/Magazines
   4. TV/radio/newspaper (Media)
   5. From a person already having cervical cancer
   6. School
   7. Awareness clinic
   8. Others (please specify______)

6. A. Have you undergone the following screening procedure for cervical cancer?
   1. 1. Per vaginal Examination  Yes/ No
   2. 2. Per speculum Examination  Yes/ No
   3. 3. Pap smear  Yes/ No
   4. Others (Please specify______)

B. If yes, when was the last time? ___________

C. If no, why not?
   1. Did not know/ not aware of the test
   2. Felt that there was no need
   3. Don’t know where it can be done locally
   4. Fear of a positive result
   5. Too expensive
   6. Fear of treatment
   7. False belief (loss of virginity, painful procedure)
   8. Others (specify________________)

7. A. Have you heard of the cervical cancer vaccine (HPV vaccine-bivalent and quadrivalent) as a prophylactic measure to prevent HPV infection and cervical cancer?  Yes/No

B. If yes, what is your source of information?
   1. Hospital source/ Family doctor
   2. Friends
   3. Books/Magazines
   4. TV/radio/newspaper (Media)
   5. From a person already having cervical cancer
   6. School
   7. Husband/ Other family members
   8. Awareness clinics
   9. Others (specify______)

8. A. Whether you would accept the vaccine/ use the vaccine?
   1. For yourself  Yes/ No
   2. For your daughter  Yes/ No
   3. For other relatives  Yes/ No

B. If yes, what are your reasons?

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Believing that it would prevent the disease
Recommendations by a health care provider to vaccinate
Positive role played by the media
Protecting oneself is important
Others (Specify_______)

C. If no, what are your reasons?

1. Lack of information about the vaccine and cervical cancer
2. Concerns about side effects and safety
3. Concerns about effectiveness of the vaccine
4. Financial cost
5. Poor patient acceptability
6. Concerns that STD related vaccine would promote sexual activity
7. Religious and ethnic background
8. Long term protection not guaranteed
9. Others (Specify______)

Knowledge and Awareness regarding cervical cancer in women with respect to risk factors, screening methods and vaccination

Informed Consent Form

I _______________________________ the undersigned, am willing to voluntarily participate in the study titled "Knowledge and Awareness regarding cervical cancer in women with respect to risk factors, screening methods and vaccination".

1. All the aspects of the study have been explained to me in great detail in the language I understand.
2. I reserve the right to withdraw my participation from the study at any given point of time.
3. My identity will not be revealed at any time during or after the completion of the study.
4. The data generated herewith can be used for publication or presentation at any given time.

Signature of the participant:
Name: Date:

Signature of the investigator:
Name: Date:

Signature of witness:
Name: Date:

Information Sheet

This is to inform you that I, Charu Dutt Arora, MBBS class of 2015 in Topiwala National Medical College, would like you to be a part of my study titled "Knowledge and Awareness regarding cervical cancer in women with respect to risk factors, screening methods and vaccination".

Contact No: 3144459663

What is the aim of the study?

1. To determine the level of awareness of cervical cancer in women with respect to risk factors, screening methods and cervical cancer vaccine

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2. To study the correlation between social class of the subject (as per Modified Prasad’s classification) with the awareness regarding cervical cancer.

3. To investigate the acceptability to the usage of the cervical cancer vaccine in the population.

4. To identify the source of information for screening methods and vaccination so the same can be used to propagate knowledge and awareness regarding cervical cancer.

**What is cervical cancer?**

Cervical cancer is a cancer of the cervical area. Cervical cancer is caused by the persistent Human Papillomavirus (HPV) infection which has been detected in 99.7% cases. There are about 100 known types of HPV classified into high risk type (mainly 16, 18, 31, 33 and 45) and low risk type (6, 11). Other risk factors include smoking, immunosupression, hormonal contraception, poor personal hygiene, multiple pregnancies, early age at sexual intercourse, family history of cervical cancer.

It commonly presents as vaginal bleeding, however symptoms may be absent till the cancer is present in its last stages. Hence the need for regular screening and checkups to detect the precancerous lesions and prevent it from progressing to an advanced stage of the disease.

The cervical cancer vaccine is most effective when given before the onset of sexual activity that is before the exposure to HPV infection. However high cost of the vaccine is a major drawback.

Cervical cancer is one of the leading causes of death amongst Indian women and a major reason for this is the lack of awareness about the disease. The higher the awareness about the disease, the earlier will be the identification and appropriate treatment can be started at an earlier stage of the disease.

Lack of awareness about the disease with respect to risk factors, screening methods and vaccination is a major hindrance for early detection and prevention of disease. Health and education ministry should promote a special course on cervical cancer for Indian women.

All women have the right to withdraw their participation at any stage. The identity of the participants will remain confidential at any time during or after the completion of the study. No invasive procedures will be performed and there is no risk of any sort involved in the study.

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**Bibliography**


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