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Cervical Cancer and its Vaccine Trends in Low- and Middle-Income Countries: A highlight

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Introduction

Cervical cancer is the fourth most common cancer in women and the fourth leading cause of cancer death, with approximately 604,000 cases reported and 342,000 deaths globally in 2020 (1). Cervical cancer develops when cells in a woman's cervix change. This cancer can affect cervix's deeper tissues and can metastasize to other sites, most commonly to the lungs, liver, bladder, vagina, and rectum (2). The majority of cases of cervical cancer are caused by human papillomavirus (HPV) infection, with HPV-16 and -18 identified as the most carcinogenic subtypes, accounting for over 50% and 10% of cases, respectively (3). Cervical cancer occurs at disproportionately higher rates in less developed countries, likely because of limited access to screening and the high cost of HPV vaccines (3).

There are three types of cervical cancer, namely squamous cell carcinoma which occurs in the squamous cell lining of the cervix and causes up to 90% of the cases, adenocarcinoma, which occurs in the mucus-secreting cells and mixed carcinoma, which is less common and has the features of the other two types (1).

Several risk factors increase the incidence of cervical cancer. These include early first sexual encounter, having multiple partners, smoking, and having co-infections, for example, chlamydia, genital herpes, and HIV infection. Multi-parous women, women who use oral contraceptives for an extended period i.e., for more than five years, and women who have been treated for cervical dysplasia are also at a greater risk of developing cervical cancer (3).

A large number of cervical cancer cases are caused by HPV infection. Therefore, vaccination against HPV can decrease the incidence of cervical cancer. There are three kinds of vaccines available: the bivalent vaccine, Cervarix, the 4-valent recombinant vaccine, Gardasil, and the 9-valent vaccine, Gardasil 9 (4). To date, 15 high-risk HPV strains have been identified, with seven of those strains (HPV 16, 18, 31, 33, 45, 52, 58) covered by the commercially available HPV vaccine, Gardasil-9 (5). The vaccine is safe and

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effective. It may be administered in two doses with an interval of nine to 12 months in between. It is recommended that the first dose of the vaccine may be given at 11-12 years of age, but maybe given as early as 9 years, up till the age of 26, if not previously vaccinated (3).

The vaccine has been important in catering to this issue of cervical cancer, but their trends are considerably low in low- and middle-income countries. A comparative analysis of 78 low and middle-income countries has shown that less than 30% of women in these countries have been introduced to the HPV vaccine. However, the toll is more than 85% of women when it comes to high-income countries (6). This depicts that vaccine trends are immensely lower in low- and middle-income countries and show a wide gap compared to high-income countries.

There are certain challenges faced by LMICs in vaccinating the population. Among the socio-cultural barriers, it was revealed that the information and knowledge among the masses are poorer in such countries. The social stigma associated with it also poses a serious threat to vaccination coverage in these countries. Moreover, parents are concerned regarding the side effects such as the early onset of sexual activity and sterility, etc. (7).

Finance also plays a key role in this regard. As these countries are devoid of infrastructure and human resources, they are not able to have good vaccine coverage for all. Moreover, reaching out to the target population in school is not much promoted in such LMICs (8). There is a lack of a strategic plan for vaccine coverage too.

Lack of interest and coordination of different stakeholders play a key role in this low incidence of vaccine coverage. Moreover, the political will to enhance vaccine coverage is also not strong enough to bring about a change in these trends (9). The lack of competitive health authorities and evidence-based decision-making is also a major barrier in this regard.

Suggestions to overcome these changes

- The HPV vaccine is the most effective solution to decrease the toll of cervical cancer in LMICs. WHO has taken a step forward in this case. The policy has been made to ensure that the HPV vaccine should be administered to all individuals at age of 35 and 45 years in all of the LMICs (10). So global efforts are needed to improve the trends of the vaccine in LMICs irrespective of the income status of the countries. The world authorities should meet hands and come to a common platform to eradicate this disease.
- Healthcare providers are the main role players in such cases as they can recommence vaccines by explaining the efficacy of the vaccine in preventing cervical cancer. It is recommended that health care providers spread awareness about how to reduce the risk by abstaining from sexual activity at a young age, not having multiple sexual partners, and using condoms, and along with that, discuss HPV vaccination as a routine cancer prevention vaccine.
- Mass awareness programs should be run to educate the whole population. In this way, the stigma associated with it can be catered and people can be more receptive to getting vaccinated.
- Specific strategies should be made and implemented with a directed time frame as well as the target population.
- Surveillance of the trends of the vaccine as well as the incidence of cancer should be done meticulously to gauge the effectiveness of the efforts. Political authorities, as well as health policymakers, should be held accountable for the implementation of effective vaccine programs in the masses.
- Moreover, there is an urgent need of an integrated healthcare system in low- and middle-income countries. As screening and HPV vaccination is the most effective way of controlling the toll of cervical cancers so it should be propagated in LMICs.

Ethics approval and consent to participate

Not applicable

Author contributions

IU and QM conceived the idea. FY, SI, and QM worked on the first draft of the manuscript. QM, SR, and IU revised and edited the final manuscript. All authors approve the final version of the manuscript.

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Competing interests

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