



Preventing Cervical Cancer in sub-Saharan Africa

Introduction

Cervical cancer is the most common cancer and the leading cancer-related cause of death among women in sub-Saharan Africa (SSA). An estimated 70,700 annual new cases occur each year in SSA, representing one-quarter of all female cancers. The magnitude of the problem has been under-recognised and under-prioritised compared to competing health priorities such as HIV/AIDS, tuberculosis and malaria. Most cases of women with cervical cancer in SSA present at advanced stages of the disease, when treatment is ineffective or not available.

Cervical cancer is caused by genital human papillomavirus (HPV) infection, the most common sexually transmitted infection among women. Of the more than 100 types of HPV, only some cause cervical cancer; types 16 and 18 are found in 70% of cases of the cancer. Other types, such as 6 and 11, cause genital warts, and others are harmless. Importantly, most people who become infected with HPV do not know they have it.

Cervical cancer is detectable and preventable through cervical screening for pre-cancerous lesions (Papanicolaou smear). Such screening has been effective in preventing cervical cancer in industrialized countries, where adequate health infrastructure and human and finance resources are available to ensure high quality and good coverage. However, this has largely failed in most developing countries where appropriate infrastructure is not achievable.

The availability of two effective prophylactic HPV vaccines gives new promise for a primary prevention strategy for HPV infection and cervical cancer. However, these vaccines will not have an effective impact in developing countries until they are affordable and integrated within the framework of national immunization programmes.

How can we prevent cervical cancer in sub-Saharan Africa?

Cervical screening

Since traditional cervical screening with Papanicolaou smear is too expensive for most developing countries, VIA (visual inspection with acetic acid) or VILI (visual inspection with Lugol's iodine), which are less infrastructure dependent, have been advocated as screening alternatives. Various evaluation studies in SSA have shown visual inspection methods, coupled with cryotherapy treatment¹ for those who screen positive, to be effective for primary screening. However, they are still prone to subjectivity, requiring good provider training and sustained quality assurance in order to achieve substantial gains in the prevention of cervical cancer in routine settings.

A more objective and reproducible screening test is detection of HPV DNA by molecular methods, which has been shown to be more sensitive than cervical cytology (Pap smear) in detecting pre-cancerous lesions in HIV-uninfected and infected women. The limitations of HPV DNA testing include the cost, infrastructure and time needed to obtain a result. Recently however, CareHPV (Qiagen Gaithersburg Inc., MD, USA) has been developed as a simple, rapid and operational HPV molecular-based test for low-resource settings that can produce results within 3 hours. The technology is compact, portable, battery-operated, and tests can be conducted with minimal training. Data from China indicate that CareHPV has the potential to reduce the incidence of cervical cancer by 56% in China if given just three times over a woman's lifetime and effective treatment is available, suggesting its potential impact in reducing the burden of cervical cancer in comparable settings like SSA. Regulatory approval is anticipated in

¹ In cryotherapy, an area of abnormal tissue on the cervix is destroyed by freezing it.



developing countries in the near future, and this test will be provided at low cost. CareHPV represents a promising alternative screening test, however its performance and diagnostic value in detecting pre-cancerous lesions need to be evaluated in African settings.

HPV vaccines

High safety and efficacy have been shown for two recently developed HPV vaccines. Gardasil® (Merck & Co., Inc.), a quadrivalent vaccine, protects against HPV types 16, 18, 6 and 11, and Cervarix™ (GlaxoSmithKline Biologicals), a bivalent vaccine, protects against HPV types 16 and 18. These HPV vaccines have shown 95% efficacy in preventing HPV 16 and 18 in large international cohorts of women, although noticeably excluding Africa. A number of studies are underway to evaluate their safety and ability to obtain an appropriate immunological response in young HIV-negative and HIV-positive women in Senegal, Tanzania and South Africa. Results from these trials are eagerly awaited in this HIV-endemic region since HIV-infected women are at an increased risk of being infected with oncogenic (cancer-inducing) HPV types, and being associated with cervical disease progression, compared to uninfected women.

As of March 2009, 22 countries in SSA have licensed the HPV vaccines, but vaccine implementation plans are lagging behind. Besides the high price of the vaccine, there still remains the challenge of delivering an 'adolescent' vaccine since no programme exists targeting this population, and the vaccine is recommended to be most effective if it is administered prior to initiation of sexual activity, which is when the risk of exposure to HPV infection increases. Local communities will need to first identify factors that influence vaccine acceptability and uptake among target populations and healthcare

providers, and then decide the most appropriate way for vaccine deployment. Further evaluation of a number of strategies considering vaccination or screening alone, or both in combination, will be needed to inform the most appropriate cost-effective prevention strategy.

Areas for action

In order to strengthen the efforts of cervical cancer prevention in sub-Saharan Africa, the following areas for action are highlighted:

Cervical screening

- Evaluation of VIA / VILI in conjunction with HPV testing (e.g. with CareHPV) as screening tools in a screen-and-treat approach.
- Evaluation of screening strategies in HIV-positive populations.

HPV vaccine delivery

- Vaccine trials in infants to evaluate the potential inclusion as part of an EPI standard immunization schedule.
- Vaccine deployment considerations: (i) community acceptability; (ii) health system capacity and channels of vaccine delivery; (iii) vaccination strategies, including appropriate age and sex, and catch-up vaccination strategies; (iv) health economics and impact modelling.
- Cost-effectiveness studies of vaccine and/or cervical screening strategies.
- Comparative analyses of cervical screening and/or vaccination strategies on disease impact.

Useful resources

Louie KS, de Sanjose S, Mayaud P. Epidemiology and prevention of human papillomavirus and cervical cancer in sub-Saharan Africa: a comprehensive review. *Tropical Medicine and International Health* (2009); 14(10): 1287-1302.

WHO/ICO Information Centre on Human Papillomavirus and Cervical Cancer (HPV Information Centre): <http://www.who.int/hpvcentre>

HPV Vaccine Global Community of Practice: <http://hpv-vaccines.net/>

International Agency for Research for Cancer: <http://www.iarc.fr/>

IARC Screening Group: <http://screening.iarc.fr/>

RHO Cervical Cancer: <http://www.rho.org/>

This factsheet was written by Karly Louie.

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