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Cervical Cancer Screening in Low-Resource Settings

ABSTRACT: Cytology-based cervical cancer screening programs require a number of elements to be successful. Certain low-resource settings, like the U.S. Affiliated Pacific Islands, lack these elements. Implementing alternative cervical cancer screening strategies in low-resource settings can provide consistent, accessible screening opportunities.

Recommendations

The following are acceptable alternative cervical cancer screening methodologies where cytology-based screening is not feasible or practical:

- Human papillomavirus (HPV) testing with subsequent treatment for women with positive test results, with or without intermediate triage using visual inspection with acetic acid
- Where HPV testing is not available, visual inspection with acetic acid followed by treatment with cryotherapy

Background

In September 2013, an expert panel on cervical cancer screening in the U.S. Territories and Pacific Island Jurisdictions met to explore screening strategies to improve the rates and efficacy of cervical cancer screening in the U.S. Affiliated Pacific Islands.* This Committee Opinion summarizes the recommendations of the American College of Obstetricians and Gynecologists (the College) based on the deliberations and findings of the expert panel.

Residents of the U.S. Affiliated Pacific Islands receive varying coverage from U.S. safety net health programs. All six of the U.S. Affiliated Pacific Islands jurisdictions receive funding for cervical cancer screening from the Title X Federal Family Planning Program and all, except the Federated States of Micronesia and the Republic of the Marshall Islands, receive funding from the Centers for Disease Control and Prevention's National Breast and Cervical Cancer Early Detection Program.

In 2009, only 30% of women in the Commonwealth of the Northern Mariana Islands had received cervical

cytology screening within the previous 3 years (1). In 2006, only 55% of women in Palau reported having had cervical cytology in the previous 5 years (2). By comparison, in 2010, 83% of U.S. women who had not reported a hysterectomy had obtained cervical cytology within the previous 3 years (3). The age-adjusted cervical cancer rate for the U.S. Affiliated Pacific Islands is 20.6 cases/100,000 (4), compared with 9.9/100,000 for the overall U.S. population (5). Cancer in the U.S. Affiliated Pacific Islands is less likely to be detected at an early stage, and higher mortality rates exist compared with the overall U.S. population (4).

Obstacles to Cytology-Based Screening in the U.S. Affiliated Pacific Islands

Many or all of the elements of a successful cytology-based screening program are lacking in each of the U.S.

*An expert panel on cervical cancer screening in the U.S. Territories and Pacific Island Jurisdictions (www.ent-s-t.com/Cervical_Cancer_Screening/) met at the request of the Centers for Disease Control and Prevention's Office of International Cancer Control, Division of Cancer Prevention and Control, and the Office of Population Affairs (Title X Federal Family Planning Program) in conjunction with the American College of Obstetricians and Gynecologists' (the College) Committee on Health Care for Underserved Women and the American Society for Colposcopy and Cervical Pathology (ASCCP). Expert panel members represented the College, ASCCP, U.S. government agencies, the World Health Organization, the Pan American Health Organization, several academic institutions including, the University of Hawaii (administrator of the Pacific Regional Cancer Programs), and health representatives from Puerto Rico and the six U.S. Affiliated Pacific Islands (the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of Palau, the Republic of the Marshall Islands, Guam, and American Samoa). The recommendations presented here are those of the College, as informed by the work of the expert panel.

Affiliated Pacific Islands. In the U.S. Affiliated Pacific Islands, screening is hampered by poverty, low health literacy, an inefficient transportation system, the absence of communication infrastructure, inconsistent health policies and data collection, and a lack of resources.

Health literacy is low in the U.S. Affiliated Pacific Islands' communities. The concept of screening to prevent disease is often not well understood. Women may be inhibited from seeking health care services because of confidentiality concerns in small communities. Cervical cytology performed in Guam must be sent 3,700 miles to Honolulu, Hawaii, for interpretation. Recently, cervical cytology could not be completed in the Federated States of Micronesia because they lacked the funds to send slides off the island for interpretation. In addition, travel to clinics for screening can be problematic. In Guam and the Commonwealth of the Northern Mariana Islands, the only public transportation available is taxi, and the cost is prohibitive. Health workers in the Republic of the Marshall Islands and the Federated States of Micronesia sporadically travel by boat to the outer islands to provide cervical cytology screening. Access to the central clinic for follow-up often requires traveling more than 50 miles in small, outboard-driven boats. This is costly and can be hindered by tides, weather, and fuel availability. Even if women can access clinics for screening, many (less than 10% in the Republic of the Marshall Islands) do not have phones, so informing them of results can be problematic (6).

Alternative Screening Methodologies

The World Health Organization (WHO) recently published a resource-based hierarchy of cervical cancer screening and treatment options focused on a "screen-and-treat" approach and reducing the number of visits to one or two (7). These evidence-based guidelines were developed for resource-poor settings like the U.S. Affiliated Pacific Islands that lack a functioning high-quality system of cytology, colposcopy, and pathology services. For low-resource settings, the WHO recommends HPV testing with treatment for women with positive test results, with or without intermediate triage using visual inspection with acetic acid. Where HPV testing is not available, the WHO recommends visual inspection with acetic acid followed by treatment. Within the framework of WHO recommendations, the expert panel considered the benefits and limitations of screening with HPV testing or visual inspection with acetic acid in the U.S. Affiliated Pacific Islands.

Visual Inspection With Acetic Acid

Visual inspection of the cervix after applying dilute acetic acid is used to screen for cervical cancer and precancer in many low- and middle-income countries. This technique involves systematic examination of the cervix with a readily available light source, usually without magnification. A *positive visual inspection with acetic acid* is defined

as the finding of a thick, well-defined acetowhite lesion adjacent to or contiguous with the squamocolumnar junction (8). The procedure can be performed by well-trained and supervised midlevel health care providers. Visual inspection with acetic acid has a high negative predictive value, greater than 99% (9). The sensitivity of visual inspection with acetic acid is comparable with that of cytology (10, 11).

Success in eradicating cervical intraepithelial neoplasia 3 using cryotherapy is reported to be 70% in women monitored for up to 3 years (12). Cryotherapy should be limited to patients with completely visualized squamocolumnar junctions, with a lesion that encompasses no more than 75% of the cervix and does not extend into the canal. For those women not eligible for cryotherapy, including those with invasive cancer, referral protocols are essential for loop electrosurgical excision procedure or appropriate treatment if cancer is likely. Although visual inspection with acetic acid, like cytology, is associated with the potential for overtreatment, treatment with cryotherapy is well tolerated and associated with low morbidity. Visual inspection with acetic acid currently is used in the Federated States of Micronesia and the Republic of the Marshall Islands. However, these services are not reimbursed through the National Breast and Cervical Cancer Early Detection Program.

Screening With Human Papillomavirus Testing

A growing body of evidence supports the use of HPV testing for primary screening of cervical cancer and its precursors. Studies in Asia, Africa, and Europe show the value of HPV testing alone (13–15). A prospective cluster randomized study in rural India showed an approximate 50% reduction in cervical cancer mortality and late-stage disease with a single lifetime HPV DNA screening test compared with controls; such a reduction was not seen in groups screened with visual inspection with acetic acid or cytology (13). A South African study of more than 6,500 previously unscreened women aged 35–63 years compared participants who received HPV testing and cryotherapy or visual inspection with acetic acid and cryotherapy with a control group screened with HPV testing and visual inspection with acetic acid, but with treatment delayed for 6 months (14). The report showed a 77% reduction in cervical intraepithelial neoplasia 3 or cancer in the HPV testing and cryotherapy group compared with the control group over 3 years. This was significantly better than the 38% reduction seen in the visual inspection with acetic acid and cryotherapy group.

The WHO notes the additional costs and logistical concerns of an additional triage visit that may counter the potential value of adding a triage test to HPV in reducing overtreatment (7). Some of the logistical barriers to the use of HPV testing in a see-and-treat format could be overcome with the widespread availability of an inexpensive, clinically validated, rapid turnaround, point-of-care HPV test.

Cultural obstacles to successful cytology screening in the U.S. Affiliated Pacific Islands potentially could be overcome with HPV testing of self-collected specimens. Self-collected specimens have similar HPV detection rates as those collected by clinicians (16). The sensitivity of testing on self-collected HPV specimens has been shown to be comparable with cytology and almost as high as physician-collected HPV specimens (17). Members of the expert panel felt that qualitative research with focus groups in the U.S. Affiliated Pacific Islands would be helpful to assess the acceptability of self-sampling in this setting.

Conclusions

The challenges of cervical cancer screening in the U.S. Affiliated Pacific Islands require adaptation of recent scientific evidence to identify appropriate strategies within a wide variety of physical, cultural, and resource environments. Unique characteristics of geography, environment, education, and low resources require innovative strategies to appropriately reach and serve women. Initiatives based on the standard cytology colposcopy treatment model may lead to harm in the face of inadequate transportation, lack of staffing, and prolonged turnaround time. The expert panel and the College support adaptation of WHO recommendations for diagnosis and treatment in one or two visits in the U.S. Affiliated Pacific Islands. The adaptation of WHO recommendations could result in improved cervical cancer prevention and more accurate identification of early-stage disease in this setting, as compared with existing cytology-based screening.

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