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Preventing cervical cancer in low-resource settings: How far have we come and what does the future hold?

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KEYWORDS

Cervical cancer;
Prevention;
Developing countries

Abstract The Alliance for Cervical Cancer Prevention (ACCP) came together in 1999 to answer key research questions and to advocate for greater global and national interest in reducing the heavy burden of morbidity and mortality caused by this preventable disease. Visual inspection with acetic acid (VIA), visual inspection with Lugol's iodine (VILI), and human papillomavirus (HPV) tests have been shown to be viable alternatives to traditional cytology. ACCP experience confirmed that cryotherapy is a safe and effective method that is acceptable to women and can be delivered by a range of health providers, including nonphysicians. Programs can maximize coverage by accommodating local needs and involving community leaders and women in planning and implementation. Advocacy efforts have led to significant policy changes and galvanized support for cervical cancer prevention. Despite the prospect of new HPV vaccines, screening will be needed for at least the next 30–40 years. Our experience has shown that with creativity, flexibility, and well-focused use of resources, the inequitable burden of cervical cancer borne by women in poor countries can be sharply reduced.

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1. Introduction

When the Alliance for Cervical Cancer Prevention (ACCP) came together in 1999, there was growing

recognition that cervical cancer was a significant cause of avoidable death among women in the developing world but little consensus about how best to tackle the problem with the resources available. The five organizations of the ACCP (EngenderHealth, the International Agency for Research on Cancer [IARC], JHPIEGO, the Pan American Health Organization, and PATH) took on

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the challenge of answering key research questions about the prevention of cervical cancer. During the course of the project, they pooled their programmatic experience, technical capacities, organizational networks, and geographic reach to build a base of evidence on screening and treatment methods, best practices and strategies for organizing cervical cancer prevention services, and ways to create demand for prevention services. The ACCP also has successfully advocated for greater global and national interest in cervical cancer disease reduction. This supplement shares a selection of the ACCP's experiences, findings, and accomplishments to encourage and support evidence-based program efforts.

The majority of deaths from cervical cancer occur in developing countries, where the traditional cytology-based, multivisit approach to cervical cancer prevention has, for the most part, not proven feasible. Therefore, the intention and focus of ACCP work was to assess innovative and alternative approaches to screening and treatment of precancerous lesions, approaches that are safe, effective, acceptable, and reliable in low-resource settings. The findings presented in this supplement come from projects in sub-Saharan Africa, Latin America, and Asia, where health care infrastructure is often weak. ACCP partners examined simplified service-delivery protocols and technologies, with the intent of maximizing coverage and minimizing infrastructure needs without jeopardizing women's safety.

2. What progress has been made?

The breadth and depth of ACCP project research over these 5 years has greatly strengthened the ACCP partners' conviction that effective and affordable strategies for cervical cancer prevention are within reach, even in poor countries in Africa where the disease burden is high. ACCP findings suggest that it is possible to implement organized cervical cancer prevention programs in low-resource settings that can reduce that burden of disease. Assessment of existing cytology-based programs further documented the genuine barriers to access they create and the reduced effectiveness caused by weak quality-control systems. Screening programs with protocols requiring multiple visits for follow-up and that depend on complex technologies yielding subjective results are not feasible in many settings.

3. Screening

Although an ideal (accurate, rapid, inexpensive, noninvasive) screening test is still far from commercial availability, there are alternatives to traditional cytology that can identify an acceptable proportion of women with treatable cervical lesions. ACCP data show that:

- Human papillomavirus (HPV) testing generally has better sensitivity and specificity than visual screening and better sensitivity than cytology. Although HPV testing is more objective and generally more accurate than other types of tests, current technical and infrastructural requirements can make HPV testing difficult to implement in low-resource areas [1–3].
- The sensitivity of visual inspection with acetic acid (VIA) is equivalent to or better than cytology, but its specificity is lower [1,4–8]. VIA can be implemented in a range of settings. Regular and consistent quality assurance is particularly important because of the subjective nature of test results [5–7,9,10].
- Visual inspection with Lugol's iodine (VILI) may have better test performance characteristics than VIA [8]. Recent data suggest that VILI is at least as specific as and more sensitive than VIA [8,9]. This demands further research to complete the building of the evidence base for this highly promising method.
- In specific developing-country settings where infrastructure and quality-assurance requirements are consistently met, cytology-based programs can be implemented effectively [3,11], but that has seldom been done on a national level.
- There is a growing consensus that the traditional diagnostic work-up that includes colposcopy and biopsy, although useful, is not essential [12]. Preliminary results from Kenya and Peru suggest that performance of a simple triage test (such as VIAM or VILI) after VIA screening can substantially reduce false-positive results without producing many false-negative results [13,14].

4. Treatment

Screening alone will accomplish little unless it is followed by effective treatment for those who need it. In examining the feasibility of different treat-

ment methods for precancerous lesions, ACCP data show that:

- Cryotherapy is a safe and effective method of treating precancerous lesions and can be delivered by a range of health providers, including nonphysicians [7,15–17]. Cryotherapy is generally less effective for severe lesions and those that cover 75% or more of the cervix and/or extend into the endocervical canal. In most single-visit programs, women with these types of lesions are referred for alternative treatment.
- Cryotherapy is acceptable to most women when it is prefaced with appropriate counseling, but in some contexts, getting partner support for the posttreatment period of abstinence or condom use can be a challenge.
- Loop electrosurgical excision procedure (LEEP) can be safely provided by physicians in a range of settings [7]. Data on its effectiveness are forthcoming.

An ACCP-sponsored study in South Africa is evaluating whether there is an association between the use of cryotherapy as part of a screen-and-treat approach and HIV acquisition. Final data from this trial will be available in 2005.

5. Service delivery

High rates of coverage; use of a reliable, accurate screening test; and the ability to effectively provide treatment to test-positive women are the three key components of cervical cancer prevention programs. Attempts to maximize coverage involve thoughtful development of services that accommodate the needs of the local population. As with any new service intervention, phased introduction is more practical than simultaneous nationwide start-up. A phased approach allows monitoring of quality of care and adaptation and refinement of systems to the local setting. Cervical cancer screening and treatment appear to be suitable for integration into already-existing reproductive health services because of the overlap in patient groups and the similarity in the clinical and counseling skills and equipment required. Mobile services reduce distance barriers for patients but require careful advance organization to ensure a sufficient patient load for efficient use of resources. Where possible, screening can be integrated with other mobile outreach services.

The single-visit approaches described in the articles in this supplement provide many advan-

tages over multivisit protocols—primarily, a high rate of completed treatment among screen-positive women, as was seen in the ACCP's Thailand project. Two-visit strategies may, however, work as well or better in some circumstances, as long as the interval between screening and treatment can be kept short. The second, delayed visit provides an opportunity for women to consult with a partner or family member before treatment, as happened with many women in Ghana, and allows partners to become involved in pretreatment counseling. Countries using a two-visit approach also can concentrate treatment in centralized locations for greater efficiency and enhanced quality control, while extending screening to primary-care facilities, as was the case in ACCP projects in Kenya and parts of Peru.

As part of the project work, ACCP partners designed and tested basic record-keeping systems and simple indicators for monitoring cervical cancer prevention services. As with any new service, it will take time to integrate these systems and indicators into health information systems, especially because the new systems compete with many other data needs. As such standardized indicators gain acceptance, though, monitoring and comparing progress toward established coverage and service-quality goals will become more feasible.

As with other preventive services, such as immunization and family planning, minimizing or obviating charges to clients for cervical cancer screening and treatment increases the likelihood of high utilization and equitable access. The ACCP experience in Kenya showed, however, that women will pay a small amount for cervical cancer screening if they understand the value of the service and are already accustomed to paying for other health services. Often, the cost of transport or lost time is a more significant barrier than service fees [18].

6. Community outreach

Availability of good quality cervical cancer screening services alone is not sufficient to ensure broad utilization. Low-resource settings present a special challenge in this regard, because screening is a preventive service that serves a primarily asymptomatic clientele already struggling to cope with more acute day-to-day problems. ACCP experiences in a variety of cultural settings have led to a better understanding of what strategies are effective and what messages are persuasive.

All ACCP partners agreed that outreach efforts that involve community leaders from the start

and generate community involvement in partnership with health services can serve to educate and inform women who are eligible for screening and to encourage surrounding communities to provide valuable material and social support. Such partnerships can also provide valuable sociocultural information needed to create culturally appropriate messages and educational materials. Increasing demand for and utilization of services, as well as engaging communities in supporting women who need follow-up treatment, is labor intensive and difficult for governments to organize and sustain. Building on existing outreach and community education programs that already provide health and prevention messages increases the likelihood of success.

7. Advocacy

ACCP project experience demonstrates that a critical barrier to start-up, implementation, and maintenance of cervical cancer screening programs that reach large populations is the lack of recognition of the problem, as well as the limited commitment to solving it. Although the picture has started to change as a result of ACCP efforts, broad-based and sustained advocacy efforts at the international, regional, national, and local levels are needed to galvanize donors and governments to support action. During the 5-year project, ACCP developed an evidence base that included analysis of the cost-effectiveness and outcomes of screening and treatment in various cultural, economic, and service-delivery settings. This evidence has played an important role in the decisions of several countries (such as Kenya, Peru, and Thailand) to initiate or accelerate development of national screening and treatment programs. In addition, several policymaking bodies from professional societies in Canada, Central America, the United Kingdom, and the United States issued a joint statement specifically recognizing the value of the combination of VIA screening and immediate cryotherapy or referral, as did a meeting of international experts convened by IARC [19,12]. The advocacy tools that are now available—for policymakers, health care providers, and the general public—will enable global and local stakeholders to begin work at all stages, from initial consideration of resource allocation at the national level to strategy development at the local level.

At a global level, organizations that influence programs and policies worldwide, including the World Health Organization, the United Nations

Population Fund, and the World Bank, have collaborated with the ACCP in various ways and have strengthened their commitment to cervical cancer prevention in recent years. As these organizations engage as advocates for both prevention and vaccine strategies, they will enable stakeholders to meet the challenge of reducing the global disease burden where it is greatest.

8. What does the future hold?

Because of all that has been accomplished by ACCP and others over the past 5 years, there is good reason to be optimistic about the possibility that low-resource countries will eventually achieve the kind of control of cervical cancer that wealthier countries gained several decades ago. Several developments in the near term could have an effect on the rate and means by which such control will be realized.

- Randomized, controlled trials in India and Africa that will be completed in the next few years will provide valuable data on the impact of new visual screening methods (VIA and VILI) and HPV testing on disease incidence and mortality. With this strong evidence, policymakers may move with more certainty to allocate resources to these approaches.
- The development of low-cost and/or rapid screening tests that are based on HPV or other biomarkers is currently under way. Introduction of these methods could greatly increase the accuracy and efficiency of screening, leading to greater impact.
- Similarly, the development of a screening test that relies on women obtaining the sample themselves in the privacy of their homes could greatly enhance the acceptability of screening and concomitantly reduce the burden on clinic-based services.
- The much-heralded arrival of a vaccine that protects against key oncogenic types of HPV offers tremendous potential to reduce women's risk of cervical cancer. Unfortunately, even if the vaccine becomes available in the next few years, it will do nothing to protect women who are already beyond the proposed preadolescent vaccination age and who will be at risk for cervical cancer for the next 30–40 years. These women will continue to need screening and treatment services, as will subsequent generations of women, since the vaccine will not be effective against all HPV types.

9. Conclusions

The ACCP experience over the past 5 years, as demonstrated in this supplement, has reaffirmed the ACCP partners' conviction that prevention of cervical cancer in low-resource settings not only is possible but is highly acceptable to women and cost-effective for health services. Even with limited human and financial resources, prevention programs can be introduced into primary-care facilities by using simple techniques and equipment and proven protocols and systems and by drawing on the skills of midlevel health workers. These services are likely to be most efficient when they are integrated into other reproductive health programs. We have learned that women are very receptive to the idea of protecting their own health if outreach methods are culturally sensitive and address their concerns and the barriers they face and if outreach engages the whole community in support of cervical cancer prevention.

Challenges certainly remain, despite the concerted efforts of national and international programs, but those challenges should not stop countries from beginning to address the problem of cervical cancer. Women have already waited far too long for these preventive services; too many have died needlessly while waiting for traditional high-resource methods to reach their towns and villages. The ACCP's experience shows that with creativity, flexibility, and well-focused use of resources, the inequitable burden of cervical cancer borne by women in poor countries can be sharply reduced.

Acknowledgments

The preparation of this document was made possible by a grant from the Bill & Melinda Gates Foundation through the Alliance for Cervical Cancer Prevention (ACCP).

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