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CLINICAL ARTICLE

Feasibility, acceptability, and effectiveness of visual inspection of the cervix with acetic acid and cryotherapy for dysplasia in Nigeria

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ABSTRACT

Objective: To demonstrate the feasibility, acceptability, and effectiveness of visual inspection of the cervix with acetic acid (VIA) and treatment of dysplasia with cryotherapy in Nigeria. *Methods:* A prospective study was conducted at Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria, between August 1, 2006, and July 31, 2009. Women aged 20–65 years who had had their sexual debut at least 3 years previously were screened for cervical dysplasia using VIA. Women with positive test results were offered cryotherapy immediately after screening. *Results:* Overall, 5529 women (mean age 40.24 ± 10.33 years) underwent screening with VIA. Dysplasia was detected among 317 (5.7%) women. Lesions suspicious for cancer were recorded among 52 (1.0%) women; histological diagnosis of invasive cervical cancer was confirmed in 38 (0.7%) women. VIA was as expected or better for 5330 (96.4%) women screened. Cryotherapy was as expected or better for 219 (99.5%) women who received treatment. Among 127 women who underwent cryotherapy and had repeat screening, 121 (95.3%) had negative test results after 1 year. *Conclusion:* Cervical cancer screening using VIA and cryotherapy was feasible and effective despite scarce resources in the Nigerian health system. Furthermore, this approach was socially and culturally acceptable.

1. Introduction

Cervical cancer is a malignant disease of the cervix [1] and is the third most frequently detected malignancy among women worldwide after breast cancer and endometrial cancer [2]. Each year, approximately 526 000 new cases and 266 000 deaths from cervical cancer occur globally [2,3].

More than 80% of the annual incidence and deaths from this disease occur in the low-income countries of South America, Southeast Asia, and Sub-Saharan Africa [2–4]. By contrast, the incidence of cervical cancer has decreased among high-income countries owing to the implementation of well coordinated screening programs that evaluate the cytology of cervical smear specimens [3,4]. Both the human and the material resources required to implement such initiatives are limited among low- and middle-income countries (LMICs), and cervical cancer screening using this method is often not available. Indeed, some studies have suggested that the only access to the cervical smear in many LMICs is via tertiary health institutions, private clinics, or at health institutions run by missionaries; consequently, this service is available to no more than 5% of all women in need of screening [3,5,6].

Therefore, attempts have been made to ensure that cervical cancer screening is accessible and affordable for women in LMICs. A single-visit strategy using visual inspection with acetic acid (VIA) at a concentration of 3%–5% for identification of precancerous lesions (dysplasia) has been shown to be applicable, feasible, and acceptable [7,8]. Any lesions can be treated during the same visit by cryotherapy, cold coagulation, electrocautery, or electrosurgical excision [7,8]. Although VIA is cheap to perform, all the treatment options except cryotherapy require resources such as electricity, high-technology equipment, and manpower that might not be readily available or supported in LMICs [6,9]. By contrast, cryotherapy uses coolant gases (e.g. carbon dioxide and nitrous oxide) and its application can be easily learned by medical and paramedical care givers [10,11].

Over the past two decades, the Alliance for Cervical Cancer Prevention has worked to provide alternative approaches to cervical cancer screening in LMICs, focusing on safety, efficacy, acceptability, and reliability [12–14]. The combination of VIA (or visual inspection with Lugol solution of iodine) and cryotherapy has been assessed in selected countries in Sub-Saharan Africa, Latin America, and Asia, where the healthcare system is often weak [15,16]. The purpose of this initiative

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Table 1
Sociodemographic characteristics and VIA test results (n = 5529).

Variable	No. (%)
Age, y	
21–30	1155 (20.9)
31–40	1887 (34.1)
41–50	1595 (28.8)
51–60	690 (12.5)
≥61	202 (3.7)
Parity	
0–2	1431 (25.9)
3–5	3430 (62.0)
≥6	668 (12.1)
Marital status	
Single or never married	380 (6.9)
Married or cohabiting	4666 (84.4)
Separated or divorced	278 (5.0)
Widowed	205 (3.7)
Education level	
None	470 (8.5)
Primary school	1480 (26.7)
Secondary school	2111 (38.2)
Tertiary	1463 (26.5)
Not stated	5 (0.1)
VIA test result	
Negative	5160 (93.3)
Positive	317 (5.7)
Lesions suspicious for cancer	52 (1.0)
Positive VIA test result by age, y [a]	
21–30	13 (4.1)
31–40	173 (54.6)
41–50	95 (30.0)
51–60	29 (9.1)
≥61	7 (2.2)
Lesions suspicious for cancer by age, y [b]	
21–30	6 (11.5)
31–40	20 (38.5)
41–50	11 (21.2)
51–60	9 (17.3)
≥61	6 (11.5)
VIA test result 1 year after cryotherapy [c]	
Negative	121 (95.3)
Positive	6 (4.7)
Lesions suspicious for cancer	0

Abbreviations: VIA, Visual inspection of the cervix with acetic acid; df, degrees of freedom.
[a] $\chi^2 = 314.12$; df = 4; $P < 0.001$ (n = 317).
[b] $\chi^2 = 12.80$; df = 4; $P = 0.012$ (n = 52).
[c] n = 127.

was to maximize screening coverage and minimize infrastructure, while maintaining patient safety [16].

As a follow-up to the work of the Alliance for Cervical Cancer Prevention, WHO developed a generic protocol to demonstrate the feasibility, acceptability, and effectiveness of VIA and cryotherapy as a single-visit method of cervical cancer screening in six Sub-Saharan African countries: Madagascar, Malawi, Nigeria, Tanzania, Uganda, and Zambia [17]. The aim of the present study was to evaluate the findings from the demonstration center in Nigeria.

2. Materials and methods

To assess a single-visit approach to cervical cancer screening, a prospective study was coordinated by the Centre for Research in Reproductive Health, Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria, between August 1, 2006, and July 31, 2009. Women eligible for participation in the study were aged 20–65 years and had had their sexual debut at least 3 years previously. Approval for the present study was obtained from the Health Research Ethics Committee of the coordinating center. All participants provided written informed consent.

Participants were recruited from various clinics at the study center, including general or consultant outpatient clinics (adult or pediatric services) and the family planning clinic (new patients and individuals attending follow-up visits). Women were also recruited from outside the hospital setting after attendance at an awareness talk and counseling sessions, which were held at various places of worship, markets, town halls, and village squares. Female primary and secondary school teachers were also invited to participate.

After enrollment, participants were invited for screening at the Centre for Research in Reproductive Health or four other sites located within a 30-km radius of this demonstration site: the Well Women clinic of Olabisi Onabanjo University Teaching Hospital, the University Health Centre at Ago-Iwoye, the State Hospital Ijebu-Ode, and the State Hospital Ishara-Remo. Screening and treatments were undertaken Mondays through Fridays at both the Center for Research in Reproductive Health and the Well Women clinic of Olabisi Onabanjo University Teaching Hospital in Sagamu. Screening and treatments at the remaining three sites took place on one day a week; the day varied by site. Either the principal investigator (P.O.A.) or the project nurse (B.O.A.) joined nurses at these three sites to conduct screening and treatment; they also reassessed every positive VIA test result before treatment was applied.

Pregnancy of 30 weeks or more was considered a contraindication to screening with VIA. Women eligible to undergo screening were placed in the lithotomy position before the cervix was exposed using a bivalve speculum. A 3%–5% solution of acetic acid was then applied to the cervix using a cotton wool swab. The VIA test result was considered negative if the cervix remained unchanged in color after 40–60 seconds. If the cervix developed a white hue (snow white, yellowish-white, or grayish-white; the acetowhite reaction), the VIA test result was recorded as positive. Ulcerations or growth on the cervical epithelium were considered to be lesions suspicious of cancer.

Women with negative test results were advised to return for screening after 3 years. Women with acetowhite reactions limited to the transformation zone and not extending into the endocervical canal medially and onto the vaginal wall laterally were given the option to undergo cryotherapy while still in the lithotomy position. Large lesions that might not be entirely covered by the freezing probe were considered ineligible for treatment during the screening visit. Women at more than 20 weeks of pregnancy were also excluded from receiving immediate treatment. Women ineligible for cryotherapy were referred for further evaluation (cervical smear and colposcopy) and for

Table 2
Participants' views on VIA and cryotherapy.

View of the procedure	No. (%)
Screened women (n = 5529)	
Perception of VIA	
As expected	4873 (88.1)
Worse than expected	7 (0.1)
Better than expected	457 (8.3)
Cannot judge	128 (2.3)
Not stated	64 (1.2)
Willingness to recommend VIA to other women	
Would recommend	5470 (98.9)
Would not recommend	0
Cannot judge	27 (0.5)
Not stated	32 (0.6)
Treated women (n = 220)	
Perception of cryotherapy	
As expected	216 (98.2)
Worse than expected	0
Better than expected	3 (1.4)
Cannot judge	1 (0.4)
Not stated	0
Willingness to recommend cryotherapy to other women	
Would recommend	209 (95.0)
Would not recommend	0
Cannot judge	9 (4.1)
Not stated	2 (0.9)

Abbreviation: VIA, Visual inspection of the cervix with acetic acid.