A comparison of two visual inspection methods for cervical cancer screening among HIV-infected women in Kenya

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Objective To determine the optimal strategy for cervical cancer screening in women with human immunodeficiency virus (HIV) infection by comparing two strategies: visual inspection of the cervix with acetic acid (VIA) and VIA followed immediately by visual inspection with Lugol’s iodine (VIA/VILI) in women with a positive VIA result.

Methods Data from a cervical cancer screening programme embedded in two HIV clinic sites in western Kenya were evaluated. Women at a central site underwent VIA, while women at a peripheral site underwent VIA/VILI. All women positive for cervical intraepithelial neoplasia grade 2 or worse (CIN 2+) on VIA and/or VILI had a confirmatory colposcopy, with a biopsy if necessary. Overall test positivity, positive predictive value (PPV) and the CIN 2+ detection rate were calculated for the two screening methods, with biopsy being the gold standard.

Findings Between October 2007 and October 2010, 2338 women were screened with VIA and 1124 with VIA/VILI. In the VIA group, 26.4% of the women tested positive for CIN 2+, in the VIA/VILI group, 21.7% tested positive (P < 0.01). Histologically confirmed CIN 2+ was detected in 8.9% and 7.8% (P = 0.27) of women in the VIA and VIA/VILI groups, respectively. The PPV of VIA for biopsy-confirmed CIN 2+ in a single round of screening was 35.2%, compared with 38.2% for VIA/VILI (P = 0.41).

Conclusion The absence of any differences between VIA and VIA/VILI in detection rates or PPV for CIN 2+ suggests that VIA, an easy testing procedure, can be used alone as a cervical cancer screening strategy in low-income settings.

Introduction

Cervical cancer is the second most common cancer among women in low- and middle-income countries (LMICs), where resources for cancer prevention programmes are often scarce. Rates of cervical cancer in sub-Saharan Africa are among the highest in the world. Infection with human immunodeficiency virus (HIV) increases women’s risk for human papillomavirus (HPV) infection, cervical cancer precursor lesions and invasive cancer. Two thirds of the world’s cases of HIV infection are found in sub-Saharan Africa, where a shortage of resources and biological factors work synergistically to increase women’s lifetime risk for developing cervical cancer. As a result, cervical cancer prevention is a public health priority in sub-Saharan Africa, especially among HIV-infected women.

Different cervical cancer screening strategies, including cytology, visual inspection with acetic acid (VIA) or with Lugol’s iodine (VILI) and HPV testing have been investigated for use in LMICs, but seldom among HIV-infected women. The infrastructural requirements necessary for successful cytology programmes, including laboratory and transport facilities, trained cytopathologists and tracking systems for specimens and patients, along with the cost and need for multiple visits, make cytology-based programmes impossible to implement in most low-resource settings. The costs of currently available HPV tests, along with a high HIV–HPV coinfection rate, make HPV testing unsuitable as a population-level strategy in countries with a high prevalence of HIV infection. As a result, many international organizations and ministries of health in LMICs have recommended VIA or VIA followed by VILI (VIA/VILI) in cases with positive VIA results as the screening tests of choice in “see & treat” or “see & refer” cervical cancer prevention strategies.

The overall test positivity rate and positive predictive value (PPV) are indicative of test performance in specific populations. Screening tests with a low PPV can result in an overburdened referral system or, in “see & treat” programmes, in many women being exposed to unnecessary treatment. Unlike sensitivity and specificity, PPV is influenced by population-specific disease prevalence and can be measured in operational settings where women only undergo diagnostic confirmation if their screening test is positive. Factors associated with HIV infection, including the prevalence of cervical lesions, their size and character and the concomitant presence of genital infections can influence the PPV of VIA or VIA/VILI and affect the overall impact and cost of a screening programme. In fact, a wide range of PPVs has been reported for visual screening tests performed in populations of HIV-infected women, making it difficult to estimate disease prevalence and plan for the costs and resources necessary for programme implementation.

To inform the implementation of the cervical cancer screening protocol in health facilities served by the Family AIDS Care and Education Services (FACES) programme, we evaluated the test positivity rate and PPV for VIA and VIA/VILI for cervical intraepithelial neoplasia grade 2 (moderate dysplasia) or worse (CIN 2+) among HIV-infected women. To do this, we performed a cross-sectional analysis of results in women who underwent cervical cancer screening and received prevention services as part of their HIV care and treatment in Kisumu, Kenya.
**Methods**

**Screening protocol**

Cervical cancer screening was offered to women enrolled for care in the period from October 2007 to October 2010 at two HIV clinics supported by FACES in Kisumu, in the Nyanza Province of western Kenya, starting in October 2007. According to the FACES Cervical Cancer Screening and Prevention protocol, all women enrolled for HIV care were eligible for screening if they were at least 23 years old and not pregnant. All services were offered free of charge.

At the Lumumba Health Centre site, women underwent VIA. At the Kisumu District Hospital site, women underwent VIA, followed immediately by VILI if the VIA result was positive. All women with positive screening results (on VIA or on both VIA and VILI) were offered confirmatory testing with colposcopy and a biopsy of any lesions looking suspicious for CIN 2+. Colposcopies were performed at Lumumba Health Centre, which allowed women seen at that centre with a positive VIA to undergo colposcopy during the same visit. Women from Kisumu District Hospital were referred to Lumumba Health Centre for colposcopy based on positive results on both VIA and VILI. The two sites were approximately two kilometres apart and accessible through public transportation or on foot. Women with negative screening results (negative VIA in either group, positive VIA followed by negative VILI in the VIA/VILI group) were offered repeat screening in three years.

Biopsy specimens were stored in 10% buffered formalin at room temperature and analysed at the Kenya Medical Research Institute pathology laboratory in Nairobi. Results were categorized as negative, inflammation, CIN 1 (mild dysplasia), CIN 2+ or invasive cancer. For specimens with more than one diagnosis, the outcome was defined in terms of the most severe lesion. Closervical surveillance with repeat screening after one year was offered to women with CIN 1 (diagnosed by colposcopic impression or biopsy) or with a colposcopic impression of CIN 2+ followed by a less severe biopsy result. Women with confirmed CIN 2+ were offered treatment with the loop electrosurgical excision procedure. Women with invasive cervical cancer were referred to hospitals for appropriate treatment.

**Testing procedures**

VIA and VILI were performed by trained and certified clinical officers and nurses. VIA was considered positive if a well-defined, opaque, densely acetowhite lesion was seen near the border of the squamocolumnar junction one minute after the application of a 3–5% acetic acid solution. VILI was defined as positive if a yellow-staining lesion (saffron or mustard in colour) was seen near the squamocolumnar junction after application of Lugol's iodine. Women who had cervical friability, erythema or pus were diagnosed with cervicitis, treated with antibiotics and invited to return for screening after resolution of the infection. Tests were considered unsatisfactory if the squamocolumnar junction could not be identified or, for VILI, if uptake of Lugol's iodine throughout the cervix was inadequate. Colposcopy was performed by two trained and certified providers (one nurse and one clinical officer) using standard guidelines for visual impression of cervical intraepithelial neoplasia.17

**Calculation of positive predictive value**

We calculated the PPV of VIA and VIA/VILI for the detection of CIN 2+ by dividing the number of biopsy confirmed CIN 2+ cases (true positives) by the number of positive screening tests. Test positivity was defined as a positive VIA result in the VIA group or as a positive result on both tests in the VIA/VILI group. For this analysis, women with visual signs of inflammation or unsatisfactory VIA or VILI results were excluded from the calculation of PPV, although they may have been referred for colposcopy. Women who underwent colposcopic biopsies but whose results were missing were also excluded. CIN 2+ results from the primary screening were used to calculate PPV.
Data collection and statistical analysis

The results of VIA, VILI, colposcopy – and information on whether a biopsy was performed – were collected at the time of the screening visit and entered into a Microsoft Access Database (Microsoft Inc., Redmond, United States of America). Data on clinical and demographic variables, including age, relationship status, education, reproductive history, use of family planning methods, CD4+ T-lymphocyte (CD4+ cell) count, stage of HIV infection according to the classification of the World Health Organization (WHO), duration of clinical care at FACES and highly active antiretroviral therapy (HAART) treatment were collected as part of routine clinical care and entered into OpenMRS, an electronic medical record system. Each woman’s lowest recorded CD4+ cell count was extracted and categorized as being under 200, from 200 to 350, from 351 to 500 and over 500 cells per microlitre (cells/µl). For those on HAART, the time since the confirmed initiation of a three-drug regimen and the type of regimen given at screening (first-line, second-line or other) were extracted.

To address incompleteness in the demographic variables, we performed multiple imputation using chained equations with logistic regression, ordinal regression, truncated linear regression and predictive mean matching. Observations with missing biopsy results or with HIV clinical care of unknown duration were excluded. We imputed 50 data sets and assessed the plausibility of the imputed values using diagnostic plots.18 Because the results of the regression models using the imputed data were not significantly different from those for VIA and VILI/VILI independently on more than two thirds of the original data set. Models were selected based on statistical significance and highest regression modelling using a backward elimination approach was carried out for any predictors with a significance level of <0.1 and with complete data for VIA and VIA/VILI.
strength of correlation for imputed data with no significant difference in trends in the original data set. Imputation and all statistical analyses were performed in Stata 11 (StataCorp LP, College Station, USA) and graphs were created with Excel 2007 (Microsoft, Seattle, USA).

Approval for the study was obtained from the Committee on Human Research at the University of California, San Francisco, and the Ethical Review Committee at the Kenya Medical Research Institute.

Results

Between October 2007 and October 2010, 3462 women between the ages of 23 and 60 years underwent cervical cancer screening in two FACES-supported HIV clinics in Kisumu, Kenya. Eligibility and initial screening results are shown in Fig. 1. Women in the VIA group were slightly younger, had more pregnancies, had used hormonal contraception more often in the past 90 days and were more likely to be on HAART than those in the VIA/VILI group (Table 1). Of the 2338 women in the VIA group, 618 (26.4%) had a positive result; of these women, 597 (96.6%) underwent immediate colposcopy. Among the 1124 women in the VIA/VILI group, 244 (21.7%) had a positive result on both tests and were referred for colposcopy ($P < 0.01$). Of these women, 235 (96.3%) underwent colposcopy within one year of the positive screening test (mean time to colposcopy: 15.7 days). The prevalence of histologically confirmed CIN 2+ was 8.9% and 7.8% ($P = 0.27$), respectively, in the VIA and VIA/VILI groups. For every case of CIN 2+ that was detected, 2.9 colposcopies and 2.7 colposcopies ($P = 0.57$) were performed in the VIA and VIA/VILI groups, respectively. The PPV of VIA for a biopsy-confirmed primary outcome of CIN 2+ on initial screening was 35.2%, compared with 38.2% for VIA/VILI ($P = 0.41$) (Table 2).

Follow-up colposcopy data were available for only 65 (17%) of the 377 women referred for increased surveillance on account of abnormal results on the first round of screening. More women in the VIA group (55 of 266, or 21%) than in the VIA/VILI group (10 of 111, or 9%) had follow-up tests ($P < 0.01$). Among the women who did, 19 (29%) additional cases of CIN 2+ were identified over the three-year study period: 17 among women in the VIA group and two among women in the VIA/VILI group. All additional cases of CIN 2+ were found at the first follow-up colposcopy. Among women who had more than one follow-up colposcopy, no additional cases of CIN 2+ were identified.

In bivariate analysis, older age was associated with significantly reduced odds of a positive screening result in both the VIA and the VIA/VILI group (Table 3). In the VIA group, women using combined oral contraceptives or progesterone implants and women who had a longer history of HIV positivity had increased age-adjusted odds of testing positively on screening. In this group, having advanced HIV infection, having been on HAART treatment for longer and being on a first-line antiretroviral regimen were negatively associated with the age-adjusted odds of a positive screening result. In the VIA/VILI group, only the use of oral contraceptives was significantly associated with the odds of a positive screening result. When evaluated in a multivariate model with adjustment for age, length of time on HAART continued to show a significant negative association with the odds of a positive VIA result (adjusted odds ratio [aOR] per month on HAART: 0.97; 95% confidence interval, CI: 0.96–0.99), while the odds of using combined oral contraceptive pills (aOR: 1.56; 95% CI: 1.24–1.96) or progesterone implants (aOR: 15.46; 95% CI: 2.94–81.34) continued to show a significant positive association with the odds of a positive VIA result in all women. For women in the VIA/VILI group, the only significant association in the multivariate model was a positive one between the use of oral contraceptive pills and the odds of having a positive VIA result (aOR: 1.53; 95% CI: 1.02–2.77).

In all women, regardless of screening strategy, test positivity rates and the proportion of cases with CIN 2+ decreased with increasing age. As a result, optimal PPV was achieved in both groups among women between 30 and 35 years of age, with a significantly lower PPV among women between the ages of 23 and 29 years and older than 35 years ($P < 0.001$ for trend in both the VIA and the VIA/VILI group).

Discussion

This paper presents outcomes from a cervical cancer screening and prevention programme among almost 3500 HIV-infected women using two different visual inspection techniques in a low-resource clinical setting. Although this study took place in western Kenya, this experience may be applicable to similar settings in other LMICs and may help with protocol planning and decision-making for clinicians and programme managers alike. Our analysis suggests that a screening strategy based on performing VILI immediately after obtaining a positive result on VIA was only slightly more efficient than VIA alone. The two strategies yielded a similar prevalence of CIN 2+ (8.9% versus 7.8%) and had similar PPVs (35.2% versus 38.2%).

As cervical cancer prevention captures increasing attention and resources, WHO and many LMICs are introducing recommendations for programmes that apply “see & treat” strategies based on VIA followed by VILI coupled with cryotherapy. Although “see & treat” programmes are more cost-effective and sustainable than those requiring multiple visits for disease confirmation, one of their drawbacks is that the prevalence of CIN 2+ among women receiving treatment is unknown. By using biopsy results as a gold standard, we were able to predict the true prevalence of disease requiring treatment, along
with rates of overtreatment, in a “see &
treat” programme.

When we stratified our results by age
group, we observed lower test
positivity rates among older women
because with age the transformation
zone becomes less clearly visible during
visual screening is lower in older women
possible that the sensitivity of unaided
visual screening is lower in older women
because with age the transformation
zone becomes less clearly visible during
visual examination. This situation
needs to be further explored in a study in
which all participants undergo colpos-
copy with biopsy, regardless of screening
results, especially in light of the findings
of other studies. However, it is also
possible that the sensitivity of unaided
visual screening is lower in older women
because with age the transformation
zone becomes less clearly visible during
visual examination – a recognized
drawback of screening methods based
on certain types of hormonal con-	raceptives and those who had known
traceptives and those who had known
traceptives and those who had known

Table 3. Demographic and clinical predictors of cervical intraepithelial neoplasia grade 2 or worse (CIN 2+) in HIV-infected women
screened for cervical cancer with two different screening strategies, Kisumu, Kenya, October 2007 to October 2010

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Total n</th>
<th>VIA* (n = 2266)</th>
<th>VIA/VILI* (n = 1058)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Negative (n = 1650)</td>
<td>Positive (n = 616)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years), mean, (SD)</td>
<td>–</td>
<td>35.5 (8.7)</td>
<td>33.5 (6.8)</td>
</tr>
<tr>
<td>Relationship status, no., (%)</td>
<td>1539</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>No current partner</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>At least one current partner</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Reproductive history, no., (%)</td>
<td>900</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Hormonal contraceptive usea</td>
<td>2966</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Oral</td>
<td>–</td>
<td>318 (20.5)</td>
<td>175 (30.6)</td>
</tr>
<tr>
<td>Injectable</td>
<td>–</td>
<td>309 (19.9)</td>
<td>130 (22.0)</td>
</tr>
<tr>
<td>Implant</td>
<td>600</td>
<td>600 (36.7)</td>
<td>211 (34.9)</td>
</tr>
<tr>
<td>Intrauterine device in placea</td>
<td>–</td>
<td>279 (17.1)</td>
<td>78 (12.9)</td>
</tr>
<tr>
<td>HIV-related parameters</td>
<td>2841</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Months since diagnosis of HIV infection, mean, (SD)</td>
<td>3326</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>WHO stage, no., (%)</td>
<td>3326</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>1</td>
<td>–</td>
<td>336 (21.0)</td>
<td>152 (25.2)</td>
</tr>
<tr>
<td>2</td>
<td>–</td>
<td>419 (25.6)</td>
<td>163 (27.0)</td>
</tr>
<tr>
<td>3</td>
<td>–</td>
<td>600 (36.7)</td>
<td>211 (34.9)</td>
</tr>
<tr>
<td>4</td>
<td>–</td>
<td>279 (17.1)</td>
<td>78 (12.9)</td>
</tr>
<tr>
<td>CD4+ cell nadir (cells/µL), no., (%)</td>
<td>2841</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&lt; 200</td>
<td>–</td>
<td>407 (28.6)</td>
<td>168 (31.5)</td>
</tr>
<tr>
<td>201–350</td>
<td>–</td>
<td>468 (32.8)</td>
<td>169 (31.7)</td>
</tr>
<tr>
<td>351–500</td>
<td>–</td>
<td>286 (20.1)</td>
<td>97 (18.2)</td>
</tr>
<tr>
<td>&gt; 500</td>
<td>–</td>
<td>264 (18.5)</td>
<td>100 (18.7)</td>
</tr>
<tr>
<td>On HAART, no., (%)</td>
<td>3460</td>
<td>988 (59.9)</td>
<td>341 (55.4)</td>
</tr>
<tr>
<td>Months on HAART, mean (SD)</td>
<td>–</td>
<td>11.0 (7.4)</td>
<td>9.2 (7.3)</td>
</tr>
<tr>
<td>On first-line regimen, no. (%)</td>
<td>1769</td>
<td>950 (56.2)</td>
<td>321 (54.1)</td>
</tr>
<tr>
<td>Months in care before HAART initiation, mean (SD)</td>
<td>3460</td>
<td>75 (4.5)</td>
<td>31 (5.2)</td>
</tr>
</tbody>
</table>

CCSP, cervical cancer screening and prevention; CI, confidence interval; HAART, highly active antiretroviral therapy; HIV, human immunodeficiency virus; OR, odds ratio; SD, standard deviation; WHO, World Health Organization.

a Cervical visual inspection with acetic acid.

b VIA, followed by visual inspection with Lugol’s iodine if VIA was positive for CIN 2+ (moderate dysplasia or worse).

c ORs of all predictors (except age) are adjusted for age at screening test.

d Within the 90 days preceding the screening visit.

Note: Row totals reflect missing data. The sum of the percentages for each predictor may not equal 100 due to rounding. VIA was performed on 2338 women and VIA/VILI on 1124 women. Excluded from this table are 138 women: 95 with cervicitis, 41 with unsatisfactory screening results and 2 with missing demographic information.

Our results also show higher rates of positive VIA results among women using certain types of hormonal contraceptives and those who had known of their positivity to HIV for a longer time. In addition, being on a first-line regimen and having been on HAART for longer were associated with lower odds of having a positive VIA. Unlike the observed association between older age and lower rates of VIA positivity, for

which the effect of age on the visibility of the transformation zone and hence on test performance is a biologically plausible explanation, these results may reflect an association between the use of hormonal contraceptives, immunosuppression and CIN 2+. Although the relationship between immunosuppression and the risk of CIN 2+ has been well established, the role played by hormonal contraceptives in this relationship is still controversial.24–26 Owing to confounding behavioural characteristics, the data obtained in this study allow no conclusion to be drawn about the relationship between screening test performance, CIN 2+ prevalence and the use of hormonal contraceptives.

We have previously shown that the screening programme described in this paper had high uptake and that satisfaction on the part of both patients and providers was high. Also the screening and treatment procedures were safe and acceptable to both patients and providers.16,27,28 In this paper, we show that the rate of follow-up colposcopy was high (96%), even among women who had to go to a different clinic to undergo colposcopy. This probably reflects the effect of counselling and of close geographic proximity and pre-existing linkages for other aspects of HIV care between the two sites where women were tested. This finding is encouraging for the many programmes that need to couple screening with either a diagnostic or a treatment visit at a second site nearby. However, a striking finding from this report is the attrition rate in the women requiring increased surveillance. Results were available for only 17% of those women who should have had a second or third colposcopy, and the proportion was significantly lower in women receiving their care in the clinical site not equipped for colposcopy. A portion of the loss to follow-up is probably attributable to some women having transferred or dropped out of HIV care. However, better procedures for identifying, training and screening this group of women are clearly necessary.

One of the main strengths of this study is that it included a large number of women undergoing cervical cancer screening as part of routine, comprehensive HIV care. While this provides insight into actual practice, there were also limitations to this analysis. Results were missing from 10% of the women who underwent biopsy and who therefore had to be excluded from the analysis. If these results had been included, the prevalence of CIN 2+ and PPV would probably have increased. However, the loss of biopsy results is problematic in biopsy-based programmes. Another limitation of our data set is the lack of colposcopic or biopsy data for women with a negative screening result. Although this would have provided the reference standard necessary to calculate the sensitivity, specificity and negative predictive value of VIA and VIA/VILI, universal colposcopy is not part of standard clinical care and would not have been feasible in this setting. Therefore, we were unable to calculate these additional important test parameters.

In summary, cervical cancer continues to affect large numbers of women and burdens health-care systems in LMICs. HIV-infected women, who have an increased risk of developing the disease, carry a disproportionate amount of the burden. Therefore, appropriate screening strategy for this population is needed. We have shown that VIA and VIA/VILI have similar PPV for CIN 2+ in HIV-positive women in western Kenya, with only slightly better diagnostic efficiency in the VIA/VILI group. Given the additional resources and training necessary to perform two screening tests rather than a single one, VIA alone appears to be a more suitable strategy for cervical cancer screening in HIV clinics.

Competing interests: None declared.
Cervical cancer screening in HIV-infected women in Kenya

Megan J Huchko et al.

Summary
Comparaison de deux méthodes d’inspection visuelle pour le dépistage du cancer du col de l’utérus chez les femmes infectées par le VIH au Kenya

Objectif Déterminer la stratégie optimale pour dépister le cancer du col de l’utérus chez les femmes infectées par le VIH (VIIH) en comparant deux stratégies: l’inspection visuelle du col de l’utérus en utilisant l’acide acétique (IVA) et l’IVA suivie immédiatement par une inspection visuelle en utilisant du soluté de Lugol (IVA/IVL) chez les femmes ayant obtenu un résultat positif pour l’IVA.

Méthodes Les données provenant d’un programme de dépistage du cancer du col de l’utérus mis en œuvre dans deux sites cliniques pour le VIH dans l’ouest du Kenya ont été évaluées. Les femmes qui consultaient dans un site central ont été examinées par IVA alors que les femmes qui consultaient dans un site périphérique ont été examinées par IVA/IVL.

Toutes les femmes présentant un résultat positif pour une néoplasie intraépithéliale du col de l’utérus de grade 2 ou supérieur (CIN 2+) après examen par IVA et/ou IVL ont ensuite eu une colposcopie de confirmation, avec une biopsie si nécessaire. La positivité globale du test, la valeur prédictive positive (VPP) et le taux de détection des lésions CIN 2+ ont été calculés pour les deux méthodes de dépistage, avec la biopsie comme référence absolue.

Résultats Entre octobre 2007 et octobre 2010, 2338 femmes ont été examinées par IVA et 1124 par IVA/IVL. Dans le groupe IVA, 26,4% des femmes ont obtenu un résultat positif pour des lésions CIN 2+; dans le groupe IVA/IVL, 21,7% des femmes ont obtenu un résultat positif (P = 0,01). Des lésions CIN 2+ confirmées histologiquement ont été détectées chez 8,9% et 7,8% (P = 0,27) des femmes dans les groupes IVA et IVA/IVL, respectivement. La VPP de l’IVA pour les lésions CIN 2+ confirmées par biopsie dans une seule série de dépistage était de 35,2%, contre 38,2% pour l’IVA/IVL (P = 0,41).

Conclusion L’absence de différence entre l’IVA et IVA/IVL pour les taux de détection ou la VPP des lésions CIN 2+ suggère que l’IVA est une procédure de test simple, qui peut être utilisée seule comme stratégie de dépistage du cancer du col de l’utérus dans les pays à faible revenu.

Conclusions
Сравнение двух методов визуального обследования при скрининге рака шейки матки у ВИЧ-позитивных женщин в Кении

Цель Определить оптимальную стратегию скрининга рака шейки матки у женщин с вирусом иммунодефицита человека (ВИЧ) посредством сравнения двух стратегий: визуального осмотра и теста с уксусной кислотой (IVA) и теста с уксусной кислотой (IVA) с немедленным следующим визуальным осмотром и тестом с этиловым спиртом Луголя (IVA/IVL) у женщин с положительным результатом по методу IVA.

Методы Была проведена оценка данных программы скрининга рака шейки матки, которая была реализована в двух ВИЧ-клиниках в западной части Кении. Женщины в центральной клинике прошли процедуру IVA, а женщины в периферийной клинике прошли процедуру IVA/IVL. В отношении всех женщин, у которых появился положительный результат теста (CIN 2+), была проведена колпоскопия, а также, при необходимости, биопсия. Общий показатель положительных
tests, prognostic accuracy of positive result (PPV) and coefficient of screening CIN 2+ were calculated for each method of screening, with the results of biopsies being considered in accordance with the guidelines. 

**Results** In the period from October 2007 to October 2010, 2338 women were screened with VIA and 1124 women — with screening using VIA/VIL. In the group, screened by the help of VIA, the test 26.4% women showed positive results on CIN 2+, and in the group VIA/VIL 21.7% tests had positive results (P < 0.01). Histologically confirmed positive results were similar for both methods of detection, with biopsies being the gold standard.

**Conclusions** The presence of differences between VIA and VIA/VIL in the rates of detection or PPV for CIN 2+ indicates that the VIA/VIL method can be used as a strategy for cervical screening in communities with low income.

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**References**


