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CERVICAL CANCER AND PAP SMEAR SCREENING IN HIV-POSITIVE WOMEN: AWARENESS, PERCEIVED RISK, AND PRACTICES

Background

Among women, cervical cancer is the second most common cancer globally, with more than half a million new cases and a quarter million deaths from the disease annually [1]. The association between HIV and invasive cervical cancer (ICC) is complex, with several studies demonstrating an increased risk of pre-invasive cervical lesions among HIV-positive women [2,3]. Previous studies have found significantly higher prevalence of human papillomavirus (HPV) infection and of high-risk HPV types in HIV positive women than in HIV negative women, with HIV positive women more likely to have high-grade cervical disease [3]. Because of the increased risk of acquiring HPV among women who are HIV-positive, after 2010 South Africa's national HIV treatment guidelines included specific guidance for cervical cancer screening [4].

Most studies of cervical cancer and HIV in southern Africa focus on clinical aspects of both diseases, as opposed to behavioral issues such as women's cervical cancer screening practices. For this reason we set out to examine awareness, perceived risk, and practices related to cervical cancer screening among HIV-positive women in an urban HIV clinic in Johannesburg, SA.

In April 2005, the non-governmental organisation Right to Care, in partnership with the South African government, established a cervical cancer screening and treatment centre alongside the HIV care, management, and treatment facility at Themba Lethu Clinic, situated in a tertiary hospital in Johannesburg. At this site, the Validation of Implementation of Cervical Cancer Screening Applications in HIV-Seropositive Women Study (VICAR 1) was conducted in 2009-2011 to compare three methods for detecting cervical cancer: standard Pap smear, visual inspection with acetic acid, and HPV detection.

VICAR 1's main goal was to estimate sensitivity, specificity, and predictive values for each method [5]. VICAR 1 participants, however, also answered an interviewer-administered, structured questionnaire containing coded questions about their medical, social, and sexual history. We used these questionnaire data to analyze women's awareness, perceived risk, and practices concerning cervical cancer and cervical cancer screening.

Methods

Our study made use of all data collected for HIV-positive women aged 18-65 years who were enrolled in VICAR 1 from November 2009 to December 2011, were not pregnant at the time of enrolment, and provided informed consent for study participation.

We assessed three outcomes:

- 1) **Awareness** of Pap smear screening and HPV was assessed as two dichotomous variables: whether the woman reported knowing what a Pap smear test is; and whether she had ever heard about HPV.
- 2) **Perceived risk** was assessed based on whether the woman indicated that she was very worried, somewhat worried, or not worried about getting cervical cancer. For the analysis, a dichotomous variable was created by combining the "very worried" and "somewhat worried" responses.
- 3) **Pap screening practice** represented self-reported screening history before enrolment and was estimated as the number of Pap smears over the number of years since HIV diagnosis. This was then categorised as adequate or not adequate practice according to the national HIV treatment guidelines [4].

Descriptive statistics (frequencies, medians, and interquartile ranges) were used to summarise demographic and clinical characteristics at enrolment. Modified Poisson regression with robust standard errors was used to estimate relative risk (RR) to identify factors at enrolment associated with awareness, perceived risk and practices related to cervical cancer and screening. Adjusted relative risks (aRRs) with 95% confidence intervals (CIs) are presented. All statistical tests performed in the analysis excluded missing data.

Results

A total of 1,202 HIV-positive women were screened and enrolled in the study. The median age at study enrolment was 38 years (IQR 32 - 43) (Table 1). Almost all the women (N=1,117; 92.9%) were on ART. The median (IQR) CD4 count closest to enrolment was 394 cells/ μ L (252-577).



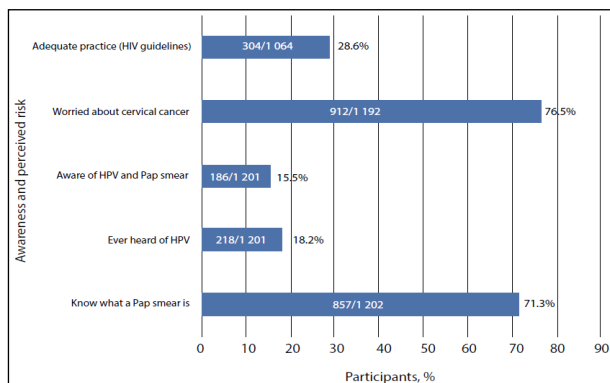
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Table 1. Characteristics of the study participants at enrolment

Variable	N=1202
Age (median (IQR))	38 (32–43)
Race-black (n, %)	1179 (98.1%)
Nationality-South African (n, %)	1075 (89.4%)
Marital status (n, %)	
Single	658 (54.7%)
Married/cohabiting	384 (32.0%)
Divorced/separated/widow	160 (13.3%)
Education (n, %)	
< Grade 10	229 (19.1%)
Grade 10 – 12	834 (69.4%)
Tertiary	113 (9.4%)
No education	26 (2.2%)
Employment (n, %)	
Full time	448 (37.3%)
Part time	182 (15.1%)
Self-employed	26 (2.2%)
Not employed	523 (43.5%)
Information missing	23 (1.9%)
CD4 count (median (IQR))	394 (252 – 572)
On ART (n, %)	1117 (92.9%)
Previous Pap smear history (n, %)	688 (57.2%)
Negative	523/688 (76.0%)
Low grade	29/688 (4.2%)
High grade/ICC	1 (0.1%)
Missing	135 (19.6%)

Nearly three quarters of participants (71.3%, 857/1,202) were aware of Pap smear screening, but far fewer were aware of HPV (18.2%, 218/1,201) or both the Pap smear test and HPV (15.5%, 186/1,201). Of 1,192 participants who responded to the question about perceived risk related to cervical cancer, 912 (76.5%) were worried or very worried about getting cervical cancer. According to the national HIV treatment guidelines based on year of HIV diagnosis before the study, 28.6% (304/1,064) had adequate cervical cancer screening practice (Figure 1).

**Figure 1. Survey responses from HIV-positive women.**

The study found that women with a higher level of education (\geq Grade 10 vs. $<$ Grade 10) were more likely to be aware of Pap smear screening and HPV, and to be worried about getting cervical cancer. Women with a tertiary education and those on ART were more likely to engage in adequate Pap screening practice while older women (≥ 40 vs. 18–29 years) were more likely to be aware of Pap smear screening and engage in adequate practice. Women of foreign nationality were less likely to be aware of Pap smear screening while those who had never had a Pap smear before were less likely to be aware of Pap smear screening or HPV. Awareness of Pap smear screening was strongly associated with adequate screening practice (aRR 16.18, 95% CI 7.69 – 34.01). Details of the results can be found in the full paper [6].

Policy Relevance

For a national approach to cervical cancer screening to succeed, women need to be aware of cervical cancer and the associated risk factors, as well as the screening and treatment services available to them. If they are not aware of the disease and associated risks, they will not seek timely screening or treatment services and are therefore at an increased risk of poor health outcomes [7,8]. We demonstrate that most (71.3%) HIV-positive women in care at a public sector HIV clinic in urban Johannesburg were aware of Pap smear screening, but fewer than 20% were aware of HPV.

Despite most women being worried or very worried about getting cervical cancer, fewer than a third of women had adequate cervical screening. As would be expected, women aware of Pap smear screening were more likely to have adequate screening practice. This suggests that strengthening health education programs related to HPV and cervical cancer, particularly for HIV-positive women, could provide an opportunity to effectively address gaps in knowledge and awareness in order to improve screening practice. As the vast majority of study participants were on ART, improving information dissemination in HIV care and treatment programs offers a promising avenue for progress.

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