



The Willingness of Human Immunodeficiency Virus-Infected Women to Cervical Cancer Screening in Northwest Ethiopia

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Abstract

Background: Cervical cancer is one of the leading causes of women's death worldwide. Screening and early treatment of precancerous cervical lesion is essential to reduce morbidity and mortality of HIV-positive women. However, significant numbers of HIV-positive women remained unscreened. In this study, we aimed to determine the willingness of HIV-infected women to cervical cancer screening in northwest Ethiopia.

Method: A cross-sectional study was conducted at ART clinics of Gondar University Referral Hospital from April to May 2016 involving 460 HIV-positive women. Bivariate and multivariable logistic regression analyses were employed.

Results: The mean age of participants (\pm SD) was 35.5 \pm 8.4 years; and 88.9% were on combined ART. Overall, 28.7% of participants had willingness to be screened. In multivariate analysis, nulliparous (AOR=1.74, 95% CI: 1.03-2.93), attainment of college education (AOR=3.94, 95% CI: 1.29-12.0), screened previously (AOR=2.50, 95% CI: 1.09-5.73) and who had awareness about the disease (AOR=1.74, 95% CI: 1.03-2.93) were independently associated with willingness of cervical cancer screening.

Conclusion: This study revealed that the willingness of HIV-infected women towards cervical cancer screening was very low in northwest Ethiopia. This finding highlights the need of creating awareness about screening and health information dissemination for HIV-infected women to prevent the occurrence of cervical cancer.

Keywords

Cervical cancer; Screening; Willingness; HIV

Introduction

Cervical cancer (CC) is one of the primary cause of women's death worldwide and the majority of the mortality is occurring in resource-limited countries [1]. Globally, more than half a million CC cases have been reported annually, and 84% of new cases were occurred in developing countries [2]. CC is the top cause of cancer death In sub-Saharan Africa [3,4]. Lack of skilled personnel and

infrastructure were the main barrier for CC care and treatment in the region [5]. In HIV-infected women, precancerous cervical lesion is expected to develop into invasive disease earlier than not infected [6]. Lower CD4 cell count and AIDS (Acquired Immuno Deficiency Syndrome) stage of the disease has been contributed for the detection of precancerous cervical lesion [7,8]. Studies in Africa reported high rate of precancerous cervical lesion in HIV infected women. For example; In Kenya, Nigeria, and Ethiopia, the prevalence of precancerous cervical lesion was 26.7%, 6% and 22%, respectively [9-11]. HPV Vaccination is used to decrease the burden of the disease but very low coverage in resource-limited countries [12].

World Health Organization (WHO) recommends that HIV-infected women should be screened for precancerous cervical lesion irrespective of their age using VIA in resource constrained settings [6]. CC is the most common cancer in Ethiopia and more than 29 million women were at risk of the disease [2]. Poverty and socio-cultural factors were the main factors identified in Ethiopian women that enhance their risk [13]. In areas where the prevalence of CC is higher, accessing women for vaccination and routine screening will reduce death significantly [14]. A cross-sectional survey from sub-Saharan Africa revealed that on-site CC screening was available in about 80% of sites [15]. Similarly, in resource-limited countries, where medical supplies are lacking, focusing on primary and secondary preventive activities can reduce the burden of the disease [5]. The "screen and treat" approach with VIA as screening tool and cryotherapy as initial therapy for precancerous cervical lesions have been used in various settings of Ethiopia [16]. All women from 30-49 years of age are eligible for screening including all sexually active HIV-positive women. Poor knowledge about the prevention and treatment of CC is the main reason for the low uptake of screening in HIV positive women [17,18]. Due to Limited study reports in Ethiopia, we aimed to determine willingness of HIV-infected women to cervical cancer screening in northwest Ethiopia.

Materials and Methods

Study design and setting

A cross-sectional study was conducted among HIV-positive women at the University of Gondar Referral Hospital from April to May 2016. A total of 460 HIV-positive women with age 18 years and above and attending ART outpatients follow up clinic were consecutively included in the study. The referral hospital is a teaching hospital found in North West Ethiopia, Gondar City and serves for more than five million people in the region. Early cervical cancer screening with VIA and cryotherapy services were available in the hospital.

Sample size determination

Sample size was determined using single population proportion formula [$n = (Z \alpha/2)^2 p(1-p)/d^2$] by considering the following assumptions; proportion of 24.8% [18], 4% margin of error, 95% confidence interval (CI) of 1.96, and 10% non-response rate then the final sample size was 495.

Data collection

Eligible patients were approached and invited to participate while

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they were attending the adult ART clinic for their regular follow-up. Patients were interviewed for collecting socio-demographic data by using a pre-tested structured questionnaire and clinical data like duration of HIV-infection and treatment, CD4 cell count, and WHO clinical staging were abstracted from patients' database.

Operational definitions

Awareness of cervical cancer screening: HIV-infected women who had heard about cervical cancer and its screening [19,20].

The willingness of cervical cancer screening: HIV positive women who responded yes to the question "Do you want to be screened for cervical cancer?" [19].

Uptake of cervical cancer screening: Self-reported history of HIV-infected women who had been screened for a precancerous cervical lesion at least once in their lifetime.

Data analysis

Data was entered using "Epi-info version 7" and analyzed by "SPSS (statistical package for social science) version 20". The bivariate and multivariable analysis model was used with odds ratio and 95% confidence interval. In bivariate analysis, variables having significant association with the dependent variable at a p-value of 0.2 and below were entered into multivariable analysis model. Odds ratios (OR) and 95% confidence interval (95% CI) was obtained and a p-value<0.05 was considered statistical significance.

Ethical issues

Ethical approval was obtained from the University of Gondar, ethical review committee and Permission to conduct the study was also obtained from Gondar university referral hospital. All study participants participated voluntarily and data was collected after obtaining informed verbal consent.

Results

Demographic and clinical characteristics of study participants

A total of 460 HIV positive women participated in the study after verbal informed consent was obtained. The mean age of respondents was 35.5 years (SD ± 8.4 years) and 281 (61%) were found in the age group of 18-34 years. Overall, 193 (42%) HIV-infected women were married, 311 (67.6%) have at least one child, 59.6% were diagnosed as HIV-positive within the last four years, 88.9% were on combined ART, 84.3% had CD4 cell count greater than 200 cell/mm³, and 54% were found in WHO clinical stage I (Table 1).

Participant's willingness to cervical cancer screening and related factors

Nearly half of participants (49.8%) were heard about CC; and 25.7% and 17.4% were heard from health care providers and mass media, respectively. Overall, 37.8% of participants had awareness about CC screening and only four women were able to identify the screening methods. Furthermore, 53% of HIV-infected women were perceived themselves at risk of CC and 10% participants reported that they were screened previously for CC at least once in their lifetime. Moreover, 28.7% (95% CI: 24.6-32.6) of participants had the willingness to be screened for cervical cancer with the available test in the hospital (VIA). Fear of test result (20.1%) and fear of pain (19.2%)

Table 1: Demographic and clinical characteristics of HIV-infected women in Northwest Ethiopia (n=460).

Characteristics	Frequency	Percent
Age category in completed year		
18-34	281	61
35-54	164	35.7
>=55	15	3.3
Residence		
Urban	353	76.7
Rural	107	23.3
Educational status		
Unable to read and write	112	24.3
Able to read and write only	105	22.8
Primary school	126	27.4
Secondary school	85	18.5
College/university	32	7
Marital status		
Married	193	42
Non married	267	58
Number of living child		
NO	149	32.4
Yes	311	67.6
Diagnosed as HIV positive (In year)		
<=4	274	59.6
5-9	146	31.7
>= 10	40	8.7
Enrolled in chronic ART care (in year)		
<=4	275	59.8
5-9	157	34.1
>= 10	28	6.1
Initiation of HAART		
Yes	409	88.9
No	51	11.1
Recent CD4 count		
<200	72	15.7
>=200	388	84.3
WHO clinical staging		
I	248	54
II	147	32
III	51	11
IV	14	3

were mentioned as the main reason for unwilling participants to the test (Table 2).

Factors associated with willingness of cervical cancer screening

In bivariate analysis, age, monthly income, marital status, parity, residence, educational status, duration of HIV-infection and enrolled in chronic HIV care, ART status of clients, CD4 cell count, client's awareness on CC screening, self-perceived risk of cervical cancer and previous history of CC screening had a p-value of less than 0.2 were subjected to multivariate analysis.

In multivariate analysis; nulliparous (AOR=1.74, 95% CI: 1.03-2.93), attainment of college education (AOR=3.94, 95% CI: 1.29-12.0), screened previously (AOR=2.50, 95% CI: 1.09-5.73) and who had awareness about the disease (AOR=1.74, 95%CI: 1.03-2.93) were independently associated with willingness of cervical cancer screening (Table 3).

Table 2: Awareness and willingness of cervical cancer screening and related factors of HIV-infected women in Northwest Ethiopia (n=460).

Characteristics	Frequency	Percent
Ever heard about CC?		
Yes	229	49.8
No	231	50.8
Source of information (n=229)		
Television/Radio	40	17.4
Printed materials	30	13.1
Health professionals	59	25.7
Family	34	14.8
Friends	37	16.1
Neighbors	24	10.4
Others ^a	5	2.5
Ever heard about CC screening (n=229)		
Yes	174	75.9
No	55	24.1
Source of information (n=174)		
Television/Radio	24	13.7
Printed materials	18	10.3
Health professionals	84	48.2
Family	16	9.6
Friends	28	16
Others ^b	4	2.2
Know screening methods (n=174)		
Yes	4	2.3
No	170	97.7
Self-perceived risk to CC?		
Yes	244	53
No	216	47
Previous history of CC screening		
Yes	46	10
No	408	90
Willingness to be screened for CC		
Yes	132	28.7
No	328	71.3
Main reasons for non-willing participants (n=328)?		
Fear of test result	66	20.1
Fear of pain	63	19.2
Long waiting time	53	16.1
No reason	38	11.6
Screened before	37	11.2
Required partners permission	30	9.1
Religious denial	28	8.5
Others ^b	13	4.2

^{a,b}: Anti-HIV clubs

Discussion

Early cervical cancer screening is recommended particularly for HIV-infected individuals in order to provide appropriate interventions in time. In our study, 28.7% of HIV-infected women had the willingness to be screened for precancerous cervical lesion. This finding was lower than a reported study done in Ethiopia (62.7%) [18] and other study finding reported in African countries such as; Kenya (65%) [21], Nigeria (79.8%) [19] and Mozambique (84%) [22]. This variation could be due to difference in the study period and sampling methods used. In the study of Nigeria, a semi-structured questionnaire and stratified sampling technique was used but in our study, all eligible HIV-infected women who were attending the ART clinic for their regular follow-up were involved consecutively. The

observed difference could be due to; in our study area, our patients were found generally of lower sociodemographic and economic status that those in Kenya, Nigeria, and Mozambique.

In this study, 71.3% of participants had no willingness to be screened for cervical cancer. Fear of test result (20.1%) and fear of pain (19.2%) were mentioned as the main reason for unwilling participants to the test. This finding was comparable with previous studies reported in Ethiopia [18], Nigeria [19], Kenya [23], and Sub Saharan Africa [24].

In this study, nulliparity was significantly associated with willingness of CC screening in our study population and this was in agreement with a study reported in Nigeria [19]. This could be due to women's intention to have children in the future. Our study also

Table 3: Factors associated with willingness of cervical cancer screening in HIV-infected women in Northwest Ethiopia (n=460).

Characteristics	Willingness of cervical cancer screening		COR (95% CI)	AOR (95% CI)
	Yes, n (%)	No, n (%)		
Parity				
Had child	56 (37.6)	93 (62.4)	1	1
Nulliparity	76 (24.4)	235 (75.6)	1.86 (1.22-2.83)*	1.74 (1.03-2.93)*
Residence				
Rural	15 (14.0)	92 (86.0)	1	1
Urban	117 (33.1)	236 (66.9)	3.04 (1.68-5.48)*	0.12 (0.06-4.54)
Age (in year)				
18-34	121 (43.1)	160 (56.9)	1	1
35-54	9 (5.5)	155 (94.5)	0.07 (1.03-3.15)*	1.3 (0.02-1.11)
>=55	2 (13.3)	13 (86.7)	0.20 (0.04-0.91)*	0.24 (0.04-1.23)
Educational Level				
Unable to read and write	16 (14.3)	96 (85.7)	1	1
Able to read and write only	32 (30.5)	73 (69.5)	2.63 (1.34-5.15)*	1.64 (0.74-3.64)
Primary	39 (31.0)	87 (69.0)	2.69 (1.40-5.15)*	1.84 (0.83-4.07)
Secondary	31 (36.5)	54 (63.5)	3.44 (1.73-6.86)*	2.37 (1.01-5.53)*
College/university	14 (43.8)	18 (56.2)	4.67 (1.94-11.2)*	3.94 (1.29-12.0)*
Marital status				
Non married	66 (24.7)	201 (75.3)	1	1
Married	66 (34.2)	127 (65.8)	1.58 (1.05-2.37)*	1.32 (0.80-2.20)
Duration of HIV infection (year)				
1-4	90 (32.8)	184 (67.2)	4.40 (1.52-12.74)*	6.25 (0.95-41.11)
5-9	38 (26.0)	108 (74.0)	3.16 (1.05-9.48)*	2.13 (0.41-10.86)
>=10	4 (10.0)	36 (90.0)	1	1
Duration of enrolled in chronic HIV care (year)				
1-4	85 (30.9)	190 (69.1)	3.72 (1.09-12.68)*	1.13 (0.13-9.52)
5-9	44 (28.0)	113 (72.0)	3.24 (0.93-11.29)	2.47 (0.34-17.81)
>=10	3 (10.7)	25 (89.3)	1	1
Initiation of combined ART				
No	8 (15.7)	43 (84.3)	1	1
Yes	124 (30.3)	285 (69.7)	2.33 (1.06-5.12)*	2.02 (0.79-5.19)
Recent CD4 count (cell/mm³)				
<200	13 (18.1)	59 (81.9)	1	1
>=200	119 (30.7)	269 (69.3)	2.00 (1.06-3.80)*	1.38 (0.63-3.02)
Self-perceived risk to CC				
No	52 (24.1)	164 (75.9)	1	1
Yes	80 (32.8)	164 (67.2)	1.53 (1.02-2.32)*	1.75 (0.06-2.90)
Awareness of CC screening				
No	67 (23.4)	219 (76.6)	1	1
Yes	65 (37.4)	109 (62.6)	1.94 (1.29-2.94)*	1.74 (1.03-2.93)*
Previous history of CC screening				
No	112 (27.1)	302 (72.9)	1	1
Yes	20 (43.5)	26 (56.5)	2.07 (1.11-3.86)*	2.50 (1.09-5.73)*

*Statistically significant association at p-value of <0.05

revealed that women who attended college education were nearly four times willing to be screened compared to those who were not able to read and write. This finding was inconsistent with previous studies reported in Ethiopia [18] and Nigeria [19] that educated women had better awareness about CC screening than illiterates and it is also supported by the direct link between health literacy and CC screening behavior of women [25].

Moreover, having awareness was significantly associated with willingness of CC screening in our study population. Participants who had awareness about CC screening were 1.7 times more willing to be screened than those who had no awareness. This finding was similar to the study conducted in Ethiopia [18] and Nigeria [19].

Our study also revealed a significant association between

previous screening history and willingness of the test. Participants who had previous screening history were 2.5 times more likely willing to be screened compared with those who were not screened for a pre-cancerous cervical lesion in their lifetime. This finding was in agreement with study reported in Nigeria [19]. This could be due to the health information they obtained from health care providers at the time of initial screening test about CC, its screening and other related issues.

Limitations of the present study are mainly related to the nature of the cross-sectional study design of the current analyses and recall and social desirability biases could affect the data. Moreover, the health facility and health care provider related factors affecting CC screening were not assessed in this study.

Conclusion

This study revealed that the willingness of HIV-infected women towards cervical cancer screening was very low in northwest Ethiopia. This finding highlights the need for creating awareness and health information dissemination by health care providers about cervical cancer and its screening importance to HIV-infected women so as to prevent the morbidity and mortality of the disease.

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Authors' Contributions

ADN brought the research idea, coordinated data collection, performed the statistical analysis, prepare the initial manuscript, read and approved the final manuscript. AS and SG were performed the statistical analysis and drafted the manuscript. All authors read and approved the final manuscript.

Conflict of Interest

Authors have no competing interests.

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