ORIGINAL RESEARCH ARTICLE

Cervical cancer in the Hauts-Bassins region of Burkina Faso: Results of a screening campaign by visual inspection with acetic acid (VIA screening in Burkina Faso)

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Abstract

This study was conducted to describe the distribution of precancerous and cancerous lesions of the cervix uteri, enumerated during a mass screening in Burkina Faso. We conducted a cross-sectional study involving 577 women aged 18 to 60 years, carried out from November 23 to December 19, 2013, in the city of Bobo-Dioulasso and in the rural commune of Bama. Regarding the screening results, 89 participants (15.4%) were positive for pre-malignant cervical lesions. Chi-square testing and logistic regression analyses were conducted to identify the likelihood of cervical pre-cancer lesion in the women. Participants less than 29 years old were approximately 3 times more likely to have cervical lesions than participants >39 years. Participants who were parous (1-3 deliveries) and multiparous (four or more deliveries) were approximately 4 times more likely to present with cervical lesions than nulliparous women. Access to screening services is low in the Bobo-Dioulasso region. Further research should be conducted to understand the incidence and distribution of cervical precancerous and cancerous lesions in Burkina Faso. *(Afr J Reprod Health 2022; 26[6]:97-103).*

Keywords: Cancer, cervical, uterus, screening, IVA, Burkina Faso

Résumé

Cette étude a été menée pour décrire la distribution des lésions précancéreuses et cancéreuses du col de l'utérus retrouvées lors d'un dépistage de masse au Burkina Faso. Nous avons mené une étude transversale portant sur 577 femmes âgées de 18 à 60 ans, réalisée du 23 novembre au 19 décembre 2013 dans la ville de Bobo-Dioulasso et dans la commune rurale de Bama. Concernant les résultats du dépistage, 89 participantes (15,4%) étaient porteuses de lésions cervicales précancéreuses ou cancéreuses. Des tests du chi deux et des analyses de régression logistique ont été effectués pour identifier le risque de lésions précancéreuses cervicales chez les femmes. Les participantes de moins de 29 ans étaient environ 3 fois plus susceptibles de présenter des lésions cervicales que les participantes de plus de 39 ans. Les participantes paucipares (1 à 3 accouchements) et multipares (quatre accouchements ou plus) étaient environ 4 fois plus susceptibles de présenter des lésions cervicales que les participantes nullipares. L'accès aux services de dépistage est faible dans la région de Bobo-Dioulasso. Des recherches supplémentaires devraient être menées pour comprendre l'épidémiologie des lésions précancéreuses et cancéreuses du col de l'utérus au Burkina Faso. *(Afr J Reprod Health 2022; 26[6]:97-103).*

Mots-clés: Cancer, cervical, utérus, dépistage, IVA, Burkina Faso

Introduction

Cervical cancer is the fourth most common cancer in women. Globally, it affects more than 500,000 women each year. It is more common in Africa, ranking as the second most common cancer in African women[1]. In countries where cancer registries have been established such as Zimbabwe, high incidence rates have been reported, in the order of 17 cases per 100,000/year. To date, few data exist on the epidemiology of cervical cancer in Burkina Faso. However, Goumbri/Lompo *et al.* estimated that cervical cancer accounted for 23% of cancers occurring in women between 1986 and 2006[2]. An

increase in the incidence of cervical cancer among younger females has been observed over the past several decades, due in part to the high incidence of human papillomavirus (HPV) in the 15-19-year age group[3,4].

The progression of cervical cancer is characterized by a long dysplastic stage and the cervix uteri is accessible using non-invasive methods, thus making the disease a particularly good candidate for screening. In particular, the World Health Organization gives the highest priority to its primary and secondary prevention of cervical cancer[5]. Although cytology-based organized screening programs have proven to be effective[6], the limited resources of Burkina Faso's health system do not allow for the implementation of such a program. The country offers cervical cancer screening in certain health facilities, including the Souro Sanou University Hospital Centre in Bobo-Dioulasso, which since September 2010 has offered single visit consultations in which visual inspection of the cervix with acetic acid (VIA) is performed, as well as cryotherapy at the same time ("see and treat" approach)[7]. This combination of diagnostics and treatment reduces costs for the patient and her family (transport and time spent in the health care facility) and minimizes loss to follow-up.

The principle screening method implemented in Burkina Faso is visual inspection after application of acetic acid (VIA). This method is a satisfactory alternative to the Papanicolaou test in areas where access to Pap smear cytology is limited[8,9]. However, despite having similar sensitivity with cytology (67- 79%), VIA has slightly lower specificity (59-86%)[10]. The single-visit approach with VIA and cryotherapy is considered effective, acceptable, and economically sustainable for resource-limited health systems[11,12]. In this study, we describe the distribution of precancerous and cancerous cervical lesions during mass screening in the Hauts-Bassins region of Burkina Faso.

Method

Mass screening for cervical cancer was conducted in the city of Bobo-Dioulasso and the rural commune of Bama from 23 November to 19 December 2013, in the Hauts-Bassins region in the west of Burkina Faso. The population of the region was estimated at 1 836 838 in 2013, and approximately 60% of people live below the poverty line[13]. The region has one University Hospital Centre (CHU), five medical centres with surgical units, and 163 community-level facilities called Health and Social Promotion Centres (CSPS). Bobo-Dioulasso is the second largest city in the country and is the capital of the region. The rural commune of Bama is about 30 kilometres from Bobo-Dioulasso and is an important agricultural centre and home to many agricultural migrant workers. The two localities have significant socio-economic disparities in access to health services. In Bobo-Dioulasso, cervical cancer screening services are provided at the university hospital in two medical centres with surgical units and 21 CSPSs, whereas the rural commune of Bama does not have this service[7].

Information regarding the screening was disseminated mainly through radio and town criers. Women between the ages of 18 and 60 years without a history of total hysterectomy or known precancerous lesions who presented for screening were eligible to participate. After informed consent, a team consisting of a gynaecologist-obstetrician and two midwives from the Souro Sanou University Hospital in Bobo-Dioulasso conducted the screening.

Visual inspection after acetic acid application relies on the detection of acetowhite lesions on the cervix. Each screened woman was given a detailed explanation of the procedure and reassured that it was painless. The steps of the visual inspection of the cervix with the use of the speculum were detailed and then the woman was invited to lie down for gynaecological examination.

The examination began with a phase without application of acetic acid. Once the patient was properly seated, a mucopurulent discharge or leucorrhoea from the cervical os or vagina was sought and its characteristics noted. Leucorrhoea was cleaned with a swab and cervicitis, ectropion, polyp, Naboth cysts, condyloma, leucoplakia were looked for. The external os, columnar epithelium, squamous epithelium and squamocolumnar junction were identified as well as the transformation zone. In the second phase, a freshly prepared 4% acetic acid solution was gently applied to the cervix using a swab. After removing the

swab, the cervix was observed for acidophilic lesions. The result could be negative, positive or strongly positive depending on the appearance of the cervix.

Data was collected using the screening form of the cervical cancer prevention program in Burkina Faso. The variables under study were socio-demographic variables (age, place of residence) and clinical variables (number of pregnancies, number of births, HIV status, and prior history of cervical cancer screening). Data entry and analysis were carried out using Epi info 3.5.1 and R version 3, respectively. Bivariate analyses and logistic regression models were used and the null hypothesis was rejected at the 5% significance level.

The screening was an initiative of an association of women concerned with women's health issues and involved no experimentation. As such no request for ethical approval was made to the institutional review board prior to the mass screening. However, all required authorisations were obtained from the authorities. Informed consent was obtained from patients after an explanation of the procedure in the local language. The data collected was processed anonymously. All patients with cervical lesions were referred to the Department of Gynaecology-Obstetrics at Souro Sanou University Hospital for appropriate management. Patients with acidophilic lesions were treated with cryotherapy. Patients with macroscopic cervical lesions suspected of malignancy underwent biopsy with histological study.

Results

Prevalence

A total of 577 women were enrolled in the study. Eighty-nine (15.42%) participants had cervical lesions deemed suspicious to be malignant or pre-malignant. Of this, eight participants (1.39%) had macroscopic lesions suspected of malignancy prior to any application of acetic acid.

Socio-demographic and clinical characteristics

The mean age of the participants was 34.9 years, and ranged from 18 to 60 years. Among the participants, 208 (36.1%) were aged between 29 and 39 years of age.

Participants had a mean of 3.9 pregnancies (ranging from 0 to 11); while 48% of the women had 4 or more pregnancies. The mean parity was 3.6 deliveries and ranged from 0 to 13. Multiparous women (4 or more births) represented 43.9% of the participants in the study, i.e. 248 women. A total of 323 (56%) study participants resided in the city of Bobo-Dioulasso. All others resided in the rural commune of Bama.

Up to 25 (4.3%) of participants reported prior screening for cervical cancer. There was a great disparity in screening rates between women from Bobo-Dioulasso versus the rural commune of Bama. Indeed, while 7.4% of women from Bobo-Dioulasso had already been screened for cervical cancer, only 0.3% of women from Bama had previously been screened. The majority of study participants (75.4%) did not know their HIV status. Of the 142 participants who knew their HIV status, 4 (2.8%) were HIV positive, while 3 were receiving antiretroviral (ARV) treatment. Given the small number of women who knew their HIV serological status, our analysis of HIV serological status was exclusively univariate.

Bivariate analysis

Table 1 summarizes results of the bivariate analysis. Table 2 details screening results by age group.

Logistic regression

Two logistic regression models were used to study the relationship between socio-demographic characteristics and screening outcome. In Model #1, the variables we used are screening result and age. In Model #2, we used screening result, age, number of deliveries, place of residence, and prior screening status. The number of pregnancies was not included in either model due to collinearity with the number of deliveries.

Table 3 presents the results of these two models. The risk of cervical lesions decreased with increasing age. Thus, at 20 years of age, the probability of a woman having cervical lesions was estimated to be 0.26; for a 40-year-old woman this estimated probability was 0.11.

Table 1: Risk associations between precancerous and cancerous lesions and the variables under study

Variable	No. participants (n=577)	Prevalence*	*p* value
Age			0.0005
Under 29	173	20,2 %	
29 to 38	208	18,75 %	
Over 39	195	7,7 %	
No. of deliveries			0.0442
Nulliparous	48	6,25 %	
From 1 to 3	269	19 %	
4 or more	248	13,7 %	
No. of pregnancies			0.102
None	39	7,7 %	
1 to 3	254	18,5 %	
4 or more	270	13 ,3 %	
Place of residence			0.7279
Bobo-Dioulasso	323	14,9 %	
Bama	254	16,1 %	
Prior screening			0.1538
Yes †	25	4,3 %	
No	552	15,9 %	

*Prevalence of precancerous and cancerous lesions within the category

†None of the participants who had previously been screened for cervical cancer had macroscopic lesions suspected of malignancy.

Table 2: Proportion of suspicious macroscopic lesions by age group

Age range	No. participants	Macroscopic lesions	p-value
Under 29 years old	173	1,7 %	0,0072
Between 29 and 38 years old	208	1,4 %	
Over 39 years old	195	1 %	

Women who had given birth 1 to 3 times were 3.95 times more likely than nulliparous to present acidophilic cervical lesions. For multiparous women the odd ratio was 4.09. These two results are significant and very highly significant

Table 3: Logistic regression

Variables	Model 1 (OR)	Model 2 (OR)
Age (Under 29)	*Reference*	*Reference*
29 to 38	0,91	0,77
39 and over	0,33 ‡	0,29†
Parity (Nulliparous)		*Reference*
1 to 3		3,95*
4 or more		4,09 ‡
Place of residence (Bobo)		0,91
Previous screening (Yes)		0,35

* Significant

† Highly significant

‡ Very highly significant

respectively. Place of residence and past exposure to cervical cancer screening did not significantly affect the risk of cervical lesions.

Discussion

Our study aimed to describe the distribution of precancerous and cancerous cervical lesions observed during a mass screening campaign conducted in the Hauts-Bassins region of Burkina Faso. Our study had numerous limitations, such as the recruitment process whereby participants voluntarily presented to the screening event, and hence the possibility of selection bias. Our analysis was also limited by not including various risk predictors such as age at first intercourse, age at first delivery, marital status, number of sexual partners, and smoking status.

However, our study has the advantage of being conducted in the general population through a free mass screening campaign that was accessible regardless of the woman's health condition. In the absence of a cancer registry, and given the limited accessibility of screening services throughout the region, these results provide a valuable baseline for establishing prevalence. The average age of participants in our study was 34.9 years, ranging from 19 to 60 years. Our data reveal similar levels of cancer prevalence to those found by earlier reports from 2004 and 2007[14,15]. In terms of HIV seropositivity, we found a prevalence of 2.8% among women who knew their serological status. This rate is similar to rates reported for the Hauts-Bassins region of Burkina Faso as a whole, which is 2%[16]. The fact that a very small proportion (4.3%)

of study participants had previously received cervical cancer screening, as well as the observed inequities in access to screening between urban and rural areas, is consistent with the literature that women most at risk of developing malignant cervical lesions have very little access to screening services[17].

At the end of the mass screening, 89 (15.42%) participants were identified with precancerous or cancerous cervical lesions. This result is relatively high when compared to studies using cytological screening rather than VIA[18,19]. Our results are comparable with those obtained in cervical cancer screening using the VIA technique in previous campaigns conducted in the region: 9.5% found in Bobo-Dioulasso in 2013[7]. Detection rates were higher in Ouagadougou, 19.9% in 2003[20], 21.3% in 2004[14]) and 39.1% in 2007[15], and were 24.1% in 1999 in Harare, Zimbabwe[21].

We found that the number of deliveries was a predictor of the risk of precancerous or cancerous cervical lesions. Our results show that women who had four or more births were four times more likely to have cervical lesions. These data are consistent with those found in the literature[19,22]. This increased risk of cervical lesions with parity can be explained by two mechanisms. Firstly, the mechanical action of repeated deliveries pushes down and maintains the junction area at the ectocervix for prolonged periods of time. This exposes the junction area to the direct action of external agents involved in cervical carcinogenesis. On the other hand, high levels of sex hormones during pregnancy are thought to play a role in the development of precancerous cervical lesions, with oestrogens in particular being implicated in stimulating human papillomavirus (HPV) activity, affecting the cervical immune response and stimulating cell proliferation in the junction zone[23–25].

We found a negative correlation between age and the risk of precancerous or cancerous cervical lesions. Although classically middle-aged women are the most affected, our result is consistent with multiple observations made over the past decades. These results suggest that cervical cancer is increasingly affecting younger women[3,26]. In Burkina Faso, Soudré *et al* found that the mean age of women with a PIII or PIV smear was 28.74 years in a study conducted in the north of the country[27]. Juvenile forms of cervical cancer have been described as being more aggressive with a shorter delay between viral infection and the onset of precancerous lesions, and have been reported to have a poorer prognosis[28]. Early and multiple births in our region may explain an even higher frequency of early cervical lesions. While the observed negative correlation between age and the risk of cervical lesions could be attributed to false positive results these epidemiological and prognostic characteristics require that special attention be paid to cervical cancer in young women.

In light of existing recommendations that screening efforts should focus on women in their fourth and fifth[29], we believe that there is still poor understanding of the incidence and distribution of cervical precancerous and cancerous lesions in Burkina Faso. Large-scale epidemiological studies, free of the limitations that affect the present study, would make it possible to clarify the epidemiological context. We also recommend the establishment of a national cancer registry in order to help develop reliable data sources for monitoring trends in cancer epidemiology. Since the completion of this mass screening, an effort is underway to ensure that all health facilities in Burkina Faso provide cervical cancer screening using the VIA technique during their routine activities, and are able to offer cryotherapy treatment to all those in need.

Acknowledgements

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