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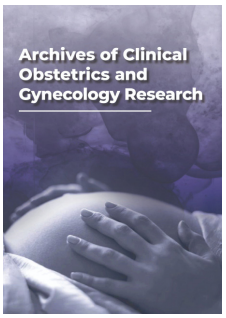
Original Article



Epidemiology and Management of Precancerous Cervical Lesions in a Rural African Setting

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Cervical precancerous lesions; Cervical cancer; Cervical cancer screening; Rural African setting.

Abstract

Introduction: *Since 2010, a cervical cancer screening program has been implemented in the city of Sikasso. To date, limited data are available regarding the epidemiology of cervical precancerous and cancerous lesions in this setting. This study aimed to determine the prevalence of these lesions and to identify associated risk factors.*

Methods: *We conducted a multicenter longitudinal study with retrospective data collection of cervical cancer screening records in Sikasso from 2010 to 2017. Descriptive statistics were used to summarize the data. Odds ratios (ORs) with 95% confidence intervals were calculated using logistic regression to identify factors associated with precancerous and cancerous cervical lesions.*

Results: *The mean age of the participants was 37 years. The prevalence of precancerous and cancerous lesions was 1.2% and 1.5%, respectively. These prevalences were higher among women living in rural areas. The main factors associated with cervical lesions were advanced age, early age at menarche, leukorrhea, and HIV infection. More than half of the women diagnosed with cervical cancer received only palliative care.*

Conclusion: *The burden of cervical cancer lesions was higher among rural women compared to their urban counterparts, with a substantial proportion receiving only palliative management. Advanced age, early menarche, and HIV infection were the determinants of cervical lesions in this population. These findings highlight the need to strengthen screening and early management strategies, particularly in rural settings.*

Introduction

Cervical cancer remains a major public health concern worldwide. It is the fourth most common cancer among women globally, but ranks second among women in developing countries. In 2018, an estimated 569,847 new cases were reported worldwide, with more than 300,000 deaths [1]. The highest incidence and mortality rates are observed in sub-Saharan Africa, particularly in Southern, Eastern, and Western Africa [2]. Consequently, mortality from this disease is approximately 18 times higher than that observed in developed countries [3]. Cervical cancer is typically preceded by a prolonged phase of precancerous lesions, which can be detected through screening before progression to invasive disease. Early detection allows timely management of cervical abnormalities, thereby reducing associated morbidity and mortality [3]. In developed countries, cervical cytology has been the cornerstone of secondary prevention of cervical cancer since the 1940s [4]. In sub-Saharan Africa, however, screening programs remain limited due to financial, logistical, and sociocultural constraints [6]. Many countries do not have organized national screening programs, and in those where such programs exist, coverage rates are often low [5,6]. For instance, in Uganda, lifetime screening coverage ranges from 4.8% to 30% [6,7]. In Mali, a national cervical cancer screening program has been implemented since 2001. However, its effectiveness remains limited, as evidenced by a screening coverage rate of less than 15% in 2010. This situation is even more concerning in rural areas, where access to screening services remains particularly low. In this context, we conducted this study to analyze the epidemiological profile and management of precancerous cervical lesions among women in Sikasso.

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Materials and Methods

Study setting

This study was conducted in the city of Sikasso, located 380 km southwest of Bamako. The region is bordered to the north by the Ségou region, to the south by the Republic of Côte d'Ivoire, to the west by the Republic of Guinea, to the east by Burkina Faso, and to the northwest by the Koulikoro region. It covers an area of 71,790 km². The study included all cervical cancer screening sites in the region, namely the regional hospital and peripheral health centers.

Study design and population

We conducted a multicenter longitudinal study with retrospective data collection. The study population consisted of all sexually active women under 65 years of age who attended outpatient consultations in gynecology services between January 1, 2010 and September 30, 2017, corresponding to a period of 7 years and 9 months.

Inclusion criteria

We included all cases of precancerous cervical lesions that were confirmed by histopathological examination following biopsy.

Sample size and data sources

The sample size was calculated using the Schwartz formula, yielding a minimum of 1,014 participants. Data were collected from medical records, histopathology laboratory reports, and cervical cancer screening registers. Screening methods included visual inspection with acetic acid (VIA) at 5% and visual inspection with Lugol's iodine (VILI).

Data analysis

Data entry and analysis were performed using SPSS software (version 12.0). Sociodemographic and clinical characteristics were described using descriptive statistics. Pearson's chi-square test was used to compare proportions. Risk factors associated with precancerous and cancerous lesions were identified using multivariate logistic regression, with estimation of Odds Ratios (OR) and their 95% confidence intervals.

Ethical considerations

Confidentiality was strictly maintained throughout the study. No participant was identified by name, in accordance with medical confidentiality requirements. All data were anonymized prior to analysis.

Results

Screening activity

Over the seven-year study period, a total of 8,090 women were screened. before 2015, the annual number of screened women was generally below 500, except in 2010 and 2012, when 1,112 and 848 women were screened, respectively. From 2015 onwards, this number increased to over 1,400 women annually, with a peak observed in 2016 (Figure 1).

Sociodemographic characteristics

The mean age of the women was 37.4 ± 9.4 years. Women under 20 years and those aged 60 years and above were the least represented (0.7% and 2.4%, respectively). The most represented age groups were 35–39 years and 40–44 years (24.3% and 20.9%, respectively). Women aged 50–64 years accounted for less than 5% of the sample. Less than 10% of the women had received formal education, and 96.3% were housewives. Furthermore,

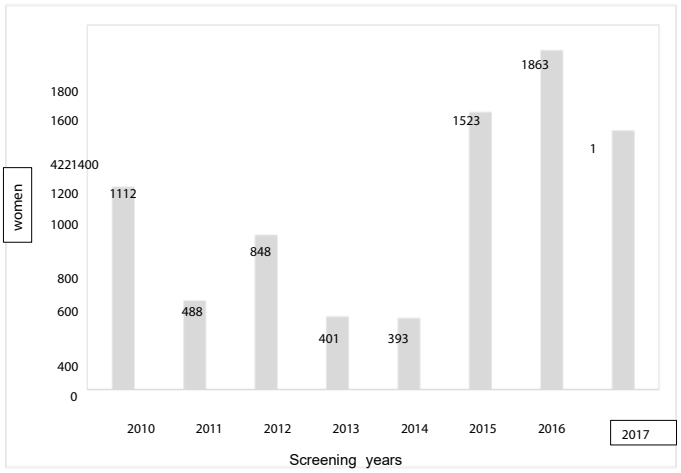

Figure 1. *Annual distribution of women screened.*

Table 1*. Sociodemographic characteristics of screened women*

Characteristics	Number (n)	Percentage (%)
Age (years)		
< 20 years	56	0.7
20–24 years	754	9.4
25–29 years	1105	13.7
30–34 years	681	8.5
35–39 years	1954	24.3
40–44 years	1681	20.9
45–49 years	1050	13.0
50–54 years	324	4.0
55–59 years	259	3.2
60–64 years	174	2.2
≥ 65 years	12	0.2
Educational level		
No formal education	7430	92.3
Primary	264	3.3
Secondary	257	3.2
Higher	55	0.7
Quranic school	44	0.6
Occupation		
Housewife	7748	96.3
Student	55	0.7
Trader	123	1.5
Civil servant	124	1.5
Marital status		
Monogamous marriage	2513	31.2
Polygamous marriage	5403	67.1
Single	67	0.8
Engaged	15	0.2
Cohabiting	52	0.7

Table 2. *Clinical characteristics of screened women*

Clinical characteristics	Number (n)	Percentage (%)
Hydrorrhea		
Yes	143	1.8
No	7900	98.2
Leucorrhea		
Yes	3150	39.1
No	4900	60.9
Bleeding		
Yes	261	3.3
No	7606	96.7
Pelvic pain		
Yes	227	2.8
No	7784	97.2
Urinary signs (infection)		
Yes	625	7.8
No	7425	92.2
Vaginal status		
Affected	96	1.2
Healthy	7954	98.8
Cervical status		
Normal	7567	94.0
Cervicitis/vaginitis	171	2.1
Condyloma	24	0.3
Polyp	44	0.6
Vegetating tumor	244	3.0
Pelvic mass		
Yes	16	0.2
No	8031	99.8

more than 60% of the women were in polygamous (Table 1).

Clinical characteristics

The most common clinical symptom was leucorrhea, reported in 40.1% of cases. Urinary tract infection was observed in 622 women (7.9%). Other clinical signs were reported with a frequency of less than 5% (Table 2).

Screening outcomes

According to Pearson's chi-square test, abnormal screening results were significantly more frequent at the hospital level compared to health centers ($p < 0.0001$) (Figure 1). The prevalence of precancerous lesions was 1.2%, while that of cancerous lesions was 1.5% (Table 3). Histologically confirmed precancerous lesions were more frequently observed among women screened at CERKES, followed by those screened at the hospital. A similar pattern was observed for cancerous lesions (Figure 2).

Age at diagnosis

As illustrated in Figure 30, the mean age at diagnosis of CIN lesions was below 40 years, whereas the mean age for CIN3 and invasive cancer was 54 years (Figure 3).

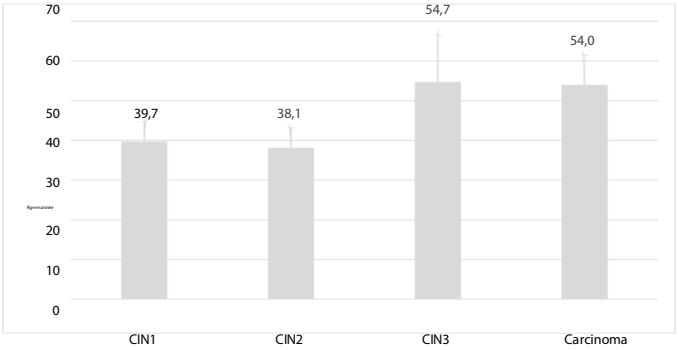

Figure 2: *Average age at diagnosis of precancerous and cancerous lesions.*

Table 3. *Pathological distribution of cervical lesions*

Pathology	Number (n)	Percentage
Normal / cervicitis	7730	97,3%
CIN1 / condyloma	65	0,8%-1,2%
CIN2-3	34	0,4%
Carcinoma	117	1,5%

Table 4. *Distribution of women according to the treatment receive*

Treatment	Number	Percentage (%)
No lesions	7719	95,9
Cryotherapy	18	0,2
Total hysterectomy	40	0,5
Palliative care	90	1,1
Referred to Bamako	55	0,7
Total deaths	5	0,06
Lost to follow-up	118	1,5

Treatment and follow-up

During the study period, 18 women were treated with cryotherapy (Table 4). At the 15-day follow-up visit, the retention rate was 94%; however, this rate decreased to 55.6% at subsequent follow-up.

Mortality

A total of five deaths occurred among non-cancer patients: one case among women without lesions and four cases among women with CIN2/CIN3. These deaths were not related to precancerous lesions (Table 4).

Discussion

Study limitations

The retrospective design of this study limits the interpretation of risk factors associated with the occurrence of cervical cancer, as causal relationships could not be established. In addition, women aged 35–45 years were the most represented age group in our sample. The underrepresentation of older women may have led to an underestimation of the prevalence of cancerous lesions, since these are more frequently observed in older age groups. In our study, visual inspection with Lugol's iodine

(VILI) appeared more sensitive than visual inspection with acetic acid (VIA). Similar findings have been reported in studies conducted in Congo, Gabon, and Cameroon [8-10]. However, in a study by Millogo in Burkina Faso, among 130 patients, VILI was positive in 122 cases (93.8%) and negative in 8 cases (6.2%) [11]. In Cameroon, the positivity rate of VIA was low, with 24 patients (1.9%) testing positive; the sensitivity of VIA was 39.34%. In contrast, a higher proportion of patients, 60 (4.8%), tested positive with VILI, with a sensitivity of 98.36% [10].

Main findings

Our results show a higher prevalence of cancerous lesions compared to precancerous lesions, likely due to the lack of systematic screening. Most patients seek medical care only after the onset of clinical symptoms. Furthermore, a higher frequency of cancerous lesions was observed among multigravida and multiparous women, as well as among women from rural areas. The main risk factors identified for cervical cancer were advanced age, age at menarche, leucorrhea, and HIV infection. The frequency of precancerous and cancerous lesions also varied with age. Women under 40 years were more likely to present with precancerous lesions (CIN1, CIN2), whereas women over 40 years had a higher frequency of cancerous lesions. These findings are consistent with a study conducted in India, which reported a higher incidence of cervical cancer among older women [12]. The higher frequency of cancer observed in older women may also be explained by the absence of organized national screening programs in most developing countries.

Additionally, the frequency of precancerous and cancerous lesions increased with gravidity and parity. Similar and sometimes conflicting findings have been reported in the literature. Several case-control studies have demonstrated a strong association between cervical cancer and a high number of full-term pregnancies [13,14]. Other studies have also reported an increased risk among multiparous women [15–17], whereas some studies found no association between parity and precancerous lesions [18–20]. Several mechanisms have been proposed to explain the increased risk of cervical lesions associated with pregnancy and childbirth, including hormonal changes and alterations in immune response [13].

In our study, the majority of cancer cases received only palliative care, suggesting late diagnosis of the disease. Unfortunately, delayed diagnosis of cervical cancer remains a major challenge in most African countries [21]. Several factors have been identified in the literature to explain this issue. As previously mentioned, very few African women have access to cervical cancer screening. One study reported that less than 1% of women in four West African countries had ever been screened for cervical cancer [22]. In Nigeria, only 9% of women working in two health facilities had undergone screening. The reasons reported included: perceived absence of risk; lack of symptoms; limited access to care; fear of vaginal examination; and lack of interest in screening [23,24]. In most studies conducted in sub-Saharan Africa, treatment was predominantly radical surgery. For example, in Burkina Faso, radical surgery accounted for 54.9% of cases[11]. In Gabon, in 2019, radical surgery was performed in 18 out of 45 patients, whether premenopausal or postmenopausal [8].

Conclusion

The management of precancerous lesions is relatively simple. However, in the case of invasive cervical cancer, treatment remains challenging due to the clinical stage at diagnosis and the limited availability of technical resources. Screening remains the most effective strategy for early detection of cervical cancer, enabling timely treatment and improving survival outcomes.

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