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Cervical Cancer Screening by Visual Inspection and Histological Type Screening in Bamako, Mali, 2021

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Abstract

Introduction

Cervical cancer is a disease caused by the human papillomavirus. It is a real health problem in Mali due to delayed screening and the lack of molecular diagnosis. It can be cured if detected early. The 9-valent HPV vaccine is used in girls to prevent cervical cancer. This study aimed to screen for cervical cancer by visual inspection with acetic acid and Lugol›s acid and to look for histological types in patients in Mali.

Methods

This was a cross-sectional study, which took place from January to March 2021 in Bamako and Kati. Samples were collected from patients in health facilities, tested by visual inspection with acetic acid/visual inspection with Lugol and cytology examination of biopsies at the G-spot pathology department.

Results

A total of 305 patients were screened using visual inspection in the 6 reference health centers, the hospitals of Bamako and Kati; 63 biopsies were taken from the women and subjected to cytological examination at Point G. The results obtained showed that six (6) cytological types of cervical cancer exist in Mali and are divided between precancerous lesions (Car epid, CJN1) with 55.56%, and cancerous lesions (Ade car, Car in situ, CIN2, CIN3) with 44.44%.

Conclusion

Cervical cancer is prevalent in Mali and manifests as precancerous and cancerous lesions. IVA/IVL tests and conventional cytology allow early detection and identification of different histological types of cervical cancer, respectively. This study should be extended to other regions of the country by raising awareness among women to adhere to it and ensuring patient care.

Keywords: Screening, Visual Test, Histological, Cervical Cancer, Uterus

1. Introduction

Cervical cancer is a sexually transmitted disease caused by the human papillomavirus (HPV) of the Papillomaviridae family. It is a real health problem in Mali, due to the delay in screening and the lack of molecular diagnosis. HPVs are highly contagious and can be transmitted in multiple ways: by direct skin-mucosal or skin-cutaneous contact, by autoinoculation, by indirect contact during childbirth and sexuality. There are three types of cervical cancer squamous cell cancers, which are the most common and classified into CIN1, CIN2 and CIN3, neuroendocrine carcinomas. Worldwide, cervical cancer is the 4th leading cause of cancer death in women. In Africa, it is the 2nd leading cause of death among female cancers. In Mali, according to data from the national registry, 56.3% are diagnosed in women. Female cervical cancers represent 28.10%. Nationally, the screening rate was 11%, in Bamako, during the same period, it remained at 17% in 2019. In this regard, Mali has implemented cervical cancer screening programs since 2001. Unfortunately, until 2010 the screening coverage rate was below 15%. It is in the logic of increasing screening coverage that the Orange Mali foundation financed a cervical

cancer screening campaign entitled "Weekend 70". However, cervical cancer is preventable by an available vaccine: The 9-valent HPV vaccine is used in girls and young women aged 9 to 26 years to prevent cervical, vaginal, and vulvar cancer, anal cancer, and genital warts caused by nine strains of HPV. The duration of protection of this vaccine is not known and does not protect against all HPV genotypes. Cervical cancer can be successfully treated if precancerous lesions are detected at an early stage. It can be detected by inspecting the cervix with the naked eye, after applying 5% acetic acid (IVA) and/or Lugol's (IVL) and by cytological study, hence the object of our study [1-8].

2. Materials and Methods

2.1. Study Sites

The work of collecting information, visual inspection and biopsy sampling was carried out in the gynecology departments of the six Reference Health Centers (CSRéf) of the District of Bamako, the University Hospitals (CHU) of Bamako (Gabriel Toure, Point G, Mali Hospital, Mothers and Children Luxembourg) and Kati, the cytology was carried out at the Point G University Hospital. Surrounded by the Kati circle, Bamako has an area of 267 km^2 with an estimated population in 2021 of 2,853,718 inhabitants. It is divided into six communes equivalent to a health district, 66 health areas including 63 functional Community Health Centers (CSCom), 14 local services, 455 medical practices, 153 medical clinics, 277 pharmacy pharmacies and 26 parapublic structures. The population of women of childbearing age in Bamako was 932,102 in 2021. The fertility rate is 5 children per woman. The rate of use of family planning services is 14.23% [6-9].

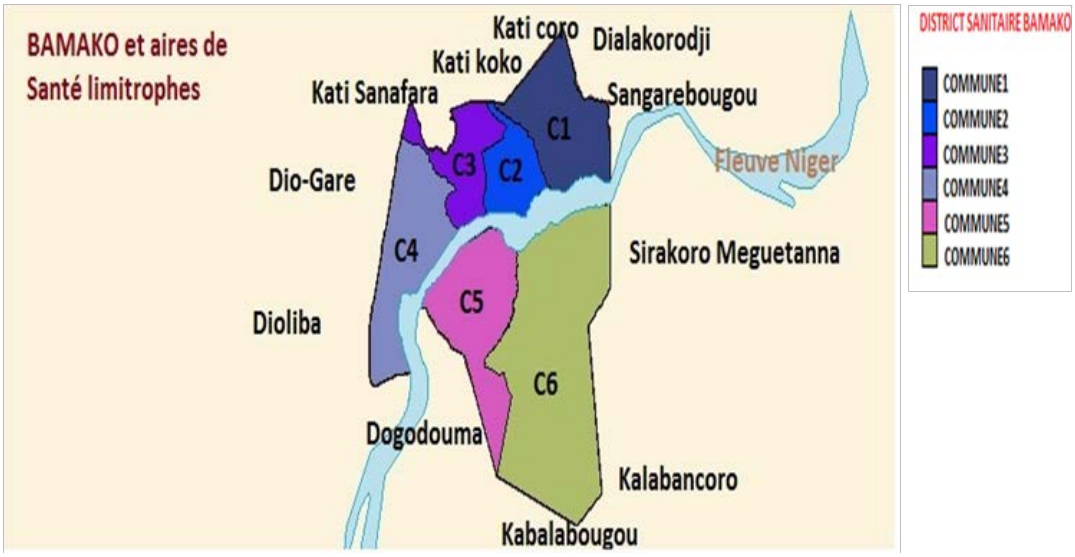

Figure 1: Map of Bamako And Neighboring Health Areas, 2021

2.2. Study Type and Period

This was a cross-sectional study, which took place from January to March 2021.

2.3. Study Population

Women of childbearing age in Bamako and Koulikoro. The study involved 305 screened patients.

2.3.1. Inclusion Criteria

Only patients screened positive for VIA/VILI tests and for whom a biopsy was performed.

2.3.2. Non-Inclusion Criteria

The study did not include: women with a total hysterectomy; menstruating women; and pregnant women.

2.4. Sampling

2.4.1. Sample Size

The previous prevalence of cervical cancer was 27.2% in Mali. The Schwartz formula was used to calculate sample sizes.

$$n=t2\times(1-p)\div m2$$

n: sample size; t: 1.96 when the confidence level is 95%; m: 5%, which is the margin of error we allow ourselves; p: expected prevalence, which is 27.2% The calculation showed that the sample size is n = 1.96^2 x 0.272 (1-0.272)/0.05^2 = 305.

2.5. Study Variable

Age, ethnicity, occupation, residence, IVA/IVL test results, precancerous lesions, cancerous lesions

2.6. Sampling

2.6.1. Type Of Sampling

The cell samples collected were biopsies.

2.6.2. Sampling Method

Tumor incision revealed during visual inspections (IVA/IVL).

2.7. Cell Sample Collection

Samples were collected from 305 women in the six Reference Health Centers (CSRéf) and the four University Hospitals (CHU) in the Bamako District of Mali and the Kati University Hospital. After this operation, cell samples (biopsies) were taken from the women who tested positive, placed in

formalin and sent to the pathology department of CHU Point G for analysis. Sixty-three (63) cell samples were collected in the pathology department of CHU Point G.

2.8. Laboratory Testing

3.8.1. VIA/VILI Test (Visual Inspection with Acetic Acid/ Visual Inspection with Lugol's Acid): This consisted of a vaginal examination using a speculum, applying diluted (3-5%) acetic acid (vinegar) to the cervix to temporarily reveal abnormal vaginal tissue, which turned white when exposed to vinegar. The cervix was then examined visually to identify color changes and determine the test results (positive or negative) for possible precancerous or cancerous lesions. After this step, cell samples (biopsies) were taken from the women who tested positive, placed in formalin, and sent to the pathology department of Point G University Hospital for analysis.

2.9. Cytological Examination

Conventional cytology was used on smears prepared from biopsies and was performed as follows: reception and recording, macroscopy, desiccation, incorporation or embedding, sectioning, staining, and mounting.

2.10. Data Processing And Analysis

Data were processed and analyzed using Excel and Epi info software. 95% confidence intervals (95% CI) were estimated. The significance threshold was 5%.

2.11. Ethical Aspects

The study protocol was submitted to the Ethics Committee of the National Institute of Public Health (INSP) for review and approval. Authorization was obtained from the health facilities. Participants' free, voluntary, and written informed consent was requested. Anonymity and confidentiality were maintained throughout the study.

3. Results

3.1. Results Of The Sociodemographic Study Ethnicity

The results showed that cervical cancer affects the vast majority of the country's ethnic groups. However, the Bambara (38%), Malinké (19.05%), and Peulh (17.46%) are more affected. The least represented ethnic groups are Bozo, Khassonké, Loma, Minianka, Saké, Sénoufo, Sonrhai, and Tamacheck (1.59%).

Age Group	Number	Percentage
≤ 35 years	16	25,40
> 35 years	47	74,60
Total	63	100

Table 1 : Distribution Of Patients By Age Group In Bamako, 2021

Age median = 47 years, with a range from 21 to 90 years. These results show that patients over the age of 35 represented 74.60% of the population.

3.2. Occupation

The results showed that housewives (87.3%) were the most represented. Women working in sales, hairdressing, and consultants were the least represented.

3.3. Residence

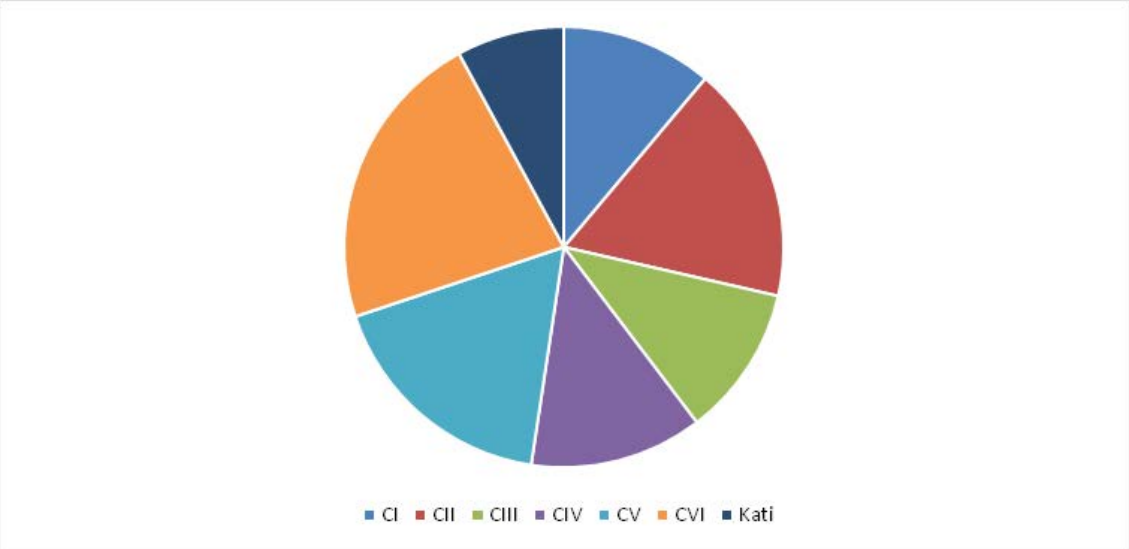

Figure 2 : Distribution Of Patients By Residence In Bamako, 2021

3.4. IVA/IVL Test Results

These results show that only 20.65% of women (63/305) tested positive for the IVA/IVL test, compared to 79.35% of women (242/305) who tested negative.

3.5. Cytology Results

The cytology results revealed 35 cases of precancerous lesions and 28 cases of cancerous lesions, representing 55.56% and 44.04%, respectively.

4. Discussion

We conducted a cross-sectional study with biopsies performed on 305 screened women, 63 of whom tested positive for the IVA/IVL test, representing a positivity rate of 20.65%. This number of screened women is admittedly low compared to the total number of women living in the District of Bamako and the Urban Commune of Kati. This could be explained by the low level of women's participation in the campaign. Thus, the highest health authorities in the country must initiate other more motivating and sustainable actions, in order to obtain the support of a very large number of women for cervical screening. Our result is comparable to that of Koné K in 2017 in Mali which had detected 256 cases. The predominance of the three ethnic groups (Bambara, Malinké, Peulh), could be linked to the strong representation of these groups in the country. Our results are consistent with those of Samaké in 2014 in Mali, which showed that the Bambara ethnic group was the most represented with 33.6%, followed by the Peulh ethnic group and the Malinké ethnic group with 20.3% and 13.3% [6-10].

The results of the IVA/IVL tests clearly demonstrate that cervical cancer is prevalent in Mali. Our results confirm those of Coulibaly et al. in Mali in 2023 [11], who demonstrated that inspection of the cervix with the naked eye constitutes a simple test for the early detection of precancerous cervical lesions and early invasive cancer. Other previous studies have obtained respectively a rate of 36.8%; 48.3%; 79% of precancerous lesions and 17% of invasive cancer; 32.07% of low-grade lesions and 26.16% of high-grade lesions. The cytological results clearly demonstrate that the conventional cervical smear (CSF) also called Papanicolaou test can be recommended for a rapid diagnosis of cervical cancer as demonstrated by Baraquin et al. in France 2023. Thus, Vicus et al. in 2014 demonstrated that screening using cytology significantly reduces the risk of death from cervical cancer with an odds ratio (OR) varying between 0.28 - 0.60 for screening by age group from 30 years ($p < 0.05$) for each analysis. Jose et al. in 2017 demonstrated that cervical cancer prevention relies on screening for precancerous lesions and appropriate treatment of this condition. Indeed, Charity et al. in 2017 in Ghana found that the onset of cervical cancer may be linked to a long period of neglect by women or health workers. Andrew-Dykens et al. in 2020 concluded that cervical cancer screening in women is a priority activity to reduce the burden of this disease . In our study, the detection of the six cytological types of cervical cancer and the professional categories of women affected by these types, demonstrate that this disease constitutes a real threat in the country. Thus, the predominance of the Car epid type obtained by our study was confirmed by Soumana in 2020 and François in 2022 who found 80 to 95% of squamous cell carcinomas among malignant tumors of cervical cancer. The high frequency of CIN1 and Car epid types, for three out of six socio-professional groups studied, demonstrates that these types are more widespread in the country. These results demonstrate that all types of cervical cancer encountered belong to the squamous cell type, with a strong representation of the Car epid type, an average representation of the CIN1 type, followed by CIN2. On the other hand, the Car in situ and CIN3 types are very weakly represented. They confirm that the squamous type is the most frequent histological type of cervical cancer cases. This predominance of the squamous type was found by Samaké in 2014 with 94.4%. Indeed, Xavier et al. in 2022 demonstrated that grade 2 and 3 intracervical neoplasia (CIN 2 and 3) exposes patients to the risk of invasive cancer and that this risk can be globally estimated at around 30% at 5 years [11-23].

5. Conclusion

Cervical cancer is prevalent in Mali and manifests as precancerous and cancerous lesions. VIA/VILI tests and conventional cytology allow for early detection and identification of the different histological types of cervical cancer, respectively. This study should be extended to other regions of the country by raising awareness among women to join it and ensuring patient care.

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