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## Mass screening for cervical cancer using visual inspection methods with acetic acid and lugol: Experience from three campaigns in Senegal

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### Abstract

**Objectives:** To take stock of 3 mass screening campaigns for cervical cancer by visual inspection methods using acetic acid and lugol.

**Material and Methods:** This was a cross-sectional study carried out during the year 2013. It concerned 3 “fairground” campaigns of systematic mass screening by visual inspection methods using acetic acid (VIA) and at Lugol (IVL). The information was collected on a survey sheet containing the following parameters: patient characteristics, level of information on cervical cancer, clinical, paraclinical and therapeutic data. Data was captured and analyzed by SPSS software version 13.0. The statistical method used was the chi-square test with a significance level set at 5%.

**Results:** During the study period, 311 patients participated in the survey and received systematic screening for precancerous cervical lesions by visual inspection methods with acetic acid and lugol. The patients were on average 41 years old, married (67.2%) with an average parity of 3 and never had a Pap smear screening (87.8%). Most of them (60.5%) had heard of cervical cancer from the media. The majority of patients (87.1%) had no knowledge of ways to prevent cervical cancer. Systematic screening for precancerous cervical lesions was most often performed by midwives (57.2%). It made it possible to find 44 positive IVAs (14.1%) and 75 positive IVLs (24.1%).

**Conclusion:** Visual inspection methods with acetic acid and lugol, easily performed, inexpensive and with immediate results seem to be a reliable alternative to the cervico-uterine smear to effectively and on a larger scale detect precancerous lesions of the cervix.

**Keywords:** Visual inspection, acetic acid, lugol, screening, cervical cancer

### Introduction

Cervical cancer is a public health problem worldwide, particularly in developing countries where it is the most common cancer in women <sup>[1]</sup>. In 2005, there were approximately 500,000 new cases of cervical cancer worldwide, of which more than 80% occurred in developing countries; cervical cancer is also estimated to be responsible for 247,000 deaths per year <sup>[1]</sup>. Infection with certain subtypes of human papilloma virus (HPV) has been shown to be the main cause of cervical cancer. Indeed, this infection has been detected in more than 99% of all cervical cancers reported <sup>[2]</sup>. It leads to histological changes that occur over a period of about 15 years. This natural evolution leaves room for the possibility of screening for precancerous lesions. In Senegal, there is no policy of organized screening by the health authorities at the population level; it is only individual screening left to the discretion of the provider.

To compensate for this deficit, health professionals (gynecologists, physicians and midwives) periodically organize free screening days using visual inspection methods with acetic acid and lugol for disadvantaged populations.

The objective of this work is to evaluate this strategy through the analysis of data collected during 3 mass campaigns.

### Material and Methods

This was a cross-sectional study conducted over a period of one year. It concerned 3 “fairground” campaigns of systematic mass screening by visual inspection methods with acetic acid (VIA) and lugol (VILI). Informations was collected on a survey form including

the following parameters: patient characteristics, lifestyle habits, level of information on cervical cancer, clinical, paraclinical and therapeutic data. Screening was done on a voluntary basis, with women presenting themselves for screening. We performed an exhaustive recruitment of all women screened during the 3 campaigns. When visual inspections were normal, we counseled the patient about cervical cancer prevention and suggested that she be screened again after one year. The VIA was positive when there was intense acetowhitening and the VILI was positive when there was iodine-negativity with blurred contours. When the test was positive, we advocated a smear or biopsy and referred the woman to the nearest health facility that could manage her. The data were entered and analyzed using SPSS version 13.0 software. The statistical method used was the Chi-square test with a significance level of 5%.

## Results

### Descriptive results

#### Qualification of the provider who performed the screening

Most of the providers (57.2%) were midwives and 42.8% were obstetricians-gynecologists.

#### Characteristics of the patients

The epidemiological profile of the patients was that of a woman aged between 35 and 54 years (65%), multiparous (64%), genitally active (70.4%) and having had her first sexual intercourse between 19 and 24 years (42.1%) (Table 1).

#### Clinical data

The reasons for consultation were most often multiple. The most frequent reasons were pelvic pain (34.4%), screening (32.5%), leucorrhoea (26.3%) and dyspareunia (4.2%). Speculum examination revealed a generally normal cervix (81.4%). There were 55 cases of cervicitis (17.7%), 2 cases of endocervical polyp (0.6%) and one cervical swelling (0.3%) (Table V).

#### Results of visual inspection with acetic acid and lugol

VIA was most often negative (85.9%). Only 44 patients (14.1%) had a positive result. VIL was negative in the majority of cases (75.9%), and positive in 75 patients (24.1%).

#### Analytical results

##### Visual inspection with acetic acid and age of patients

There was a statistically significant association between the risk of acetowhite lesions and the age of the patients ( $p=0.01$ ) (Table 2).

##### Visual inspection with lugol and patient age

The incidence of positive VILI was higher with increasing age, but there was no statistically significant relationship ( $p=0.06$ ) (Table 3).

##### Visual inspection with acetic acid and age of patients at first intercourse

Two-thirds of the patients (70.4%) who had their first sexual intercourse before 19 years of age had a positive VIA with a statistically significant association ( $p=0.0001$ ) (Table 4).

**Visual inspection with lugol and age of patients at first intercourse :** The majority of patients (68%) who had their first sexual intercourse before 19 years of age had a positive VILI with a statistically significant association ( $p=0.0001$ ) (Table 5).

## Discussion

### Feasibility of mass screening campaigns

The number of patients screened in 3 days of campaigns (311, i.e. more than 100 patients per day) seems significant when compared to the number of 378 (approximately one patient per day) screened in one year at the IHS [3]. Thus, increasing the number of such initiatives would reach a large number of women and improve accessibility to screening.

The visual inspection methods require few resources (Gynecological table, speculum, swab, acetic acid and lugol), can be performed by any trained health care provider and are easy to replicate. In our study, 57.2% of patients were screened by midwives.

### Epidemiology

The epidemiological profile of our patients was that of a woman aged on average 41 years, married (67.2%), multiparous (64%), in a period of genital activity (70.4%), who had never been screened (87.8%), who had had her first sexual intercourse on average at the age of 20 years and who had heard about cervical cancer at least once (60.5%) through the media (37.3%). This profile presents some particularities compared to those found in the literature. Indeed, the average age of our patients was comparable to that recorded by CISSE [3] in Senegal which was 39 years. In Mali, SYLLA [4] found a predominance of the 30 to 39 age group. However, the average age of our patients was lower than that found by KABIBOU in Benin [5] which was 32.6 years.

In our series, 40.2% of the patients had had early sexual intercourse between 13 and 18 years of age. This rate is comparable to that recorded by CISSE [3], which was 42.9%. Cervical cancer is considered a sexually transmitted infection. Early sexual intercourse is therefore a risk factor [6, 7] in that it can lead to infection with the Human Papilloma Virus (HPV), which is now recognized as the cause of this disease.

One hundred eighty-eight patients (60.5%) had received information about cervical cancer. This rate was relatively high compared to the rate of 56.2% recorded by DIOURI [8] in Morocco. However, it is almost identical to the rate of 61.8% found by CISSE [3], at the EPS1 IHS in Dakar. The relatively good level of information of our patients is certainly the consequence of the information and awareness campaigns on gynecological and breast cancers conducted throughout the country at the initiative of health care providers. Furthermore, we noted that only 12.2% of our sample had ever been screened for cervical cancer by cervico-vaginal smear. This could be explained by the fact that in our developing countries, for various reasons, practitioners perform oriented screening, only in front of local signs. There is still a lot of work to be done to improve this situation, and this could be achieved through opportunity screening, but also and especially through mass screening campaigns.

### Results of the tests

Visual inspection with acetic acid (VIA) detected 14.1% of acidophilic areas. This rate is comparable to the 19% rate found by TRAORE [9] in Mali. However, it is much lower than the rate found by NENE [10] which was 57.3% of cervical abnormalities.

VIL detected 24.1% of iodine-negative areas. This rate is slightly higher than the 22.2% found by SYLLA [4] in Mali.

In Benin, KABIBOU [5] recorded a lower rate of 6.81% of precancerous cervical lesions. On the other hand, our rate is lower than the one found by TRAORE [9], which is about 31.5%. When comparing our results with those of CISSE [3] at the EPS1 IHS, the rate of cervical lesions recorded in our work is by far higher. The visual inspection methods are based on naked eye examination and the results depend on the experience of the practitioner. These methods should be considered as a means of referral and require a diagnostic cytological examination such as UFH which is the gold standard in cervical cancer screening. In our work, in all patients who had an acetowhite and/or iodine-negative lesion, a cervico-vaginal smear was requested and they were referred to the local gynecologist for further management. In our study, we found a large difference between the results of VIA (14.1% acetowhite lesions) and VILI (24.1% iodine-negative lesions). This could be explained by the fact that acetowhitening is more difficult to assess than iodine-

negativity for an inexperienced provider. Thus, a number of acetowhite lesions would likely go undetected. In these visual inspection techniques when the two results are discordant, the test is considered positive.

A multi-variate analysis found that acetowhite lesions were higher the older the patient was ( $p=0.01$ ) or the younger the age at first intercourse ( $p=0.0001$ ). Concerning iodine-negative lesions, they were more frequent the earlier the age at first intercourse ( $p=0.0001$ ).

In general, our results are in line with the literature in which is recognized as a population at high risk of developing cervical cancer, women who have had sexual intercourse before 17 years, multiple sexual partners, marriage before 20 years, more than five children with the first before 20 years, repeated genital infections with HSV II or HPV 16, 18, 31, 33, 35, 39, 45, 51; as well as those with a low socioeconomic level and immunocompromised women [11].

**Table 1:** Patient characteristics (N=311).

Patient characteristics	Number	Frequency (%)
<b>Age (years)</b>		
< 25	14	4,5
25 – 34	51	16,4
35 – 44	100	32,2
45 – 54	102	32,8
55 – 64	41	13,2
≥ 65	03	0,9
<b>Parity</b>		
Nulliparous	26	8,4
Primiparous	18	5,8
Pauperous	68	21,9
Multiparous	199	64
<b>Hormonal status</b>		
Genital activity	219	70,4
Menopause	92	29,6
<b>Source of information on cervical cancer</b>		
None	123	39,5
Family and friends	37	12
Media	116	37,3
Medical staff	35	11,2
<b>Knowledge of how to prevent cervical cancer</b>		
None	271	7,1
Known screening methods	40	12,9
<b>Age at first sexual intercourse</b>		
< 14	3	0,9
14 – 18	122	39,3
19 – 24	131	42,1
25 – 30	46	14,8
> 30	9	2,9
<b>History of screening by CUS*</b>		
No	273	87,8
At least one previous CUS	38	12,2

\*CUS: cervical-uterine smear

**Table 2:** Results by age of patients who underwent VIA for cervical cancer screening (N=311).

VIA Age (years old)	Négative	Positive	Total
< 25	13	1 (2,3%)*	14
25 - 34	50	1 (2,3%)*	51
35 - 44	85	15 (34,1%)*	100
45 - 54	85	17 (38,6%)*	102
55 - 64	33	8 (18,2%)*	41
65 and more	01	2 (4,5%)*	03
Total	267	44	311

$p=0,01$

**Table 3:** Results by age of patients who underwent VILI for cervical cancer screening (N=311).

IVL Age (years old)	Négative	Positive	Total
< 25	13	01 (1,3%)	14
25 - 34	42	09 (12%)	51
35 - 44	80	20 (26,7%)	100
45 - 54	70	32 (42,7%)	102
55 - 64	30	11 (14,7%)	41
65 and more	01	02 (2,6%)	03
Total	236	75	311

p=0,06

**Table 4:** Outcomes by age at first intercourse of patients with VIA for cervical cancer screening (N=311).

IVA Age at 1 <sup>st</sup> sexual intercourse (years old)	Négative	Positive	Total
< 14	03	-	03
14 - 18	91	31 (70,4%)*	122
19 - 24	119	12 (27,3%)	131
25 - 30	45	01 (2,3%)	46
> 30	09	00*	09
Total	267	44	311

\*p = 0,0001

**Table 5:** Outcomes by age at first intercourse of patients with VILI for cervical cancer screening (N=311).

VII Age at 1 <sup>st</sup> sexual intercourse (years old)	Négative	Positive	Total
< 14	01	02 (2,7%)	03
14 - 18	73	49 (65,3%)*	122
19 - 24	110	21 (28%)	131
25 - 30	43	03 (4%)	46
> 30	09	00*	09
Total	236	75	311

\*p=0,0001

## Conclusion

Screening for precancerous and cancerous lesions of the cervix using visual inspection methods with acetic acid and lugol through mass screening campaigns is a good alternative to cervical smear in our developing countries where there is no organized screening policy and where the means of screening are not always accessible to the population.

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