



Dynamics of Factors Responsible for the Resurgence of Cervical Cancer Lesions in Women in Developing Countries

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Cervical cancer is a major public health problem worldwide and it remains one of the most common malignancies of women. The purpose was to determine, factors responsible for the upsurge of the uterine cells lesions observed on cervical smear abnormalities among Cameroonian women. To achieve our goals, the current study was carried out in three regions of Cameroon: South, Far North and Center Region for a period of two years. It was a cross sectional and descriptive study. Analyses of samples collected were performed at the biological laboratory of each hospital. All women aged 18 to 65, with sexually active were included in our study. Principal techniques used

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were the conventional Papanicolaou staining method. The Sample size was made up of 1443 women, among these; 43 had unsatisfactory profiles and 1400 satisfactory profile with a median age of the study population being 35.33 ± 7.1 . Microscopy analyses showed some microorganisms such as *Trichomonas vaginalis*; *Candida albicans*; *Gardnerella Vaginalis* and *Aspergillus*. Abnormalities were distributed as follow; NIL/M (71%), ASCUS (9.7%), ASGUS (10.2%), LSIL (6.8%), HSIL (2.3%). The most representative age group was [30-35] (24.7%) (P value=0.02). A high percentage was observed among polygamous group. Microscopy smears presented some koilocytes cells presenting binucleation as observed. Analyses of first early intercourse ($r^2=0.3$), showed the lack of correlation with appearance of lesions; the same observation was done with number of pregnancy ($r^2=0.4$). The use of intra uterine device (IUD) ($r^2=0.9$) and injections ($r^2=0.9$), as contraceptive methods showed correlation between cervical lesions, as well as the number of sexual partners ($r^2=0.98$). The last significant analyses was observed by comparing appearance of lesions and drug habits especially alcoholism ($r^2=0.9$) and nicotinism ($r^2=0.91$). Microbial infections showed a correlated data between infections by *Trichomonas Vaginalis* (P value= 0.003) and Herpes Simplex Virus ($r^2=0.8$); these observations places these infections as risk factors involved in the upsurge of precancerous lesions. At the end of this study, we can conclude that the number of pregnancies and sexual partners; the use of IUD and injections as contraceptive method and the consumption of alcohol and tobacco are risks factors identified during this study able to enhance the upsurge of precancerous lesions; to these we can add microbial infections.

Keywords: Cervical cancer; precancerous lesions; risk factors; developing country.

1. INTRODUCTION

Cervical cancer is the most common female cancer in Africa [1,2]; it is a real public health problem for developing countries especially in Cameroon [3]. It is the second most common cancer in women worldwide after breast, cancer with 528,000 new cases each year [2,4,5]. High incidences are observed in Africa with rates over 50 per 100,000 and standardized mortality rates for age sometimes exceeding 40 per 100 000 [6]. For example in 2008, there was an extremely high rates of cervical cancer (more 50/100 000 women) in Tanzania, Zambia, Kenya and Guinea Conakry [7]. In Cameroon, many women are at risk of developing cervical cancer with a high prevalence of high-grade dysplasia in some localities as well as in large urban centers [8]. Cervical cancer has the particular characteristic to elicit asymptomatic precancerous lesions for many years. In most cases, these lesions will regress spontaneously and only a small number of them will progress to invasive cancer [2]. According to the recommendations of the essential practices guide published by World Health Organization in 2007, it is possible to avoid deaths associated with cervical cancer adapter through early screening and treatment of this disease. It helped significantly to reduce the incidence of invasive cancers and mortality in most developed countries.

2. METHODOLOGY

2.1 Study Design

2.1.1 Study sites

This cross sectional study took place at different district hospitals of each study sites. The technique and reading of slides were performed at the Training and Research Institute of Development (TRID) in Yaounde.

2.1.2 Study population

The duration of the study was 2 years from June 2014 to May 2016. All women aged 18 to 65 years old with sexually actives were included in our study.

2.2 Ethical Statement

After obtaining an ethical clearance (n° 2014/08/485/CE/CNERSH/SP), we conducted an awareness and sensitization campaign in order to inform the population about cervical cancer and risk factors of cervical cancer. Communication was done through radio, information leaflets in various public and private health structures and secondary education schools.

2.3 Samples Collection

Collection of samples was performed as follows; on gynecological table, cervical swabs were collected with ayre spatula in three different zone (vagina, exo and endocervix), these cells were stained before spreading with a cell fixator. Samples were directly sent to the laboratory for further analyses. The first step was the gradual rehydration of samples by successively passing the slides in decreasing degree of alcohol containers (95°, 70° and 50°), then inside distilled water. Harris hematoxylin was used to color the cell nucleus. Then after gradual dehydration in increasing alcohol (50°, 70°, 80°, 95°), slides were soaked in Orange G6 solution in order to color the cytoplasm before putting inside the polychrome EA50 for deep cell cytoplasm coloration. Immersion in absolute alcohol solution was the last step of this technique. Few drops of Eukitt were added on the slide [8]. The interpretation of the smear was performed according to the 2001 Bethesda classification system.

2.4 Data Collection

Patients were subjected to survey questionnaires for the collection of social data.

2.5 Statistical Analyses

The information gathered on datasheet was analyzed by statistical software and Microsoft Excel 2007, Graph Pad Prism 6.0.

3. RESULTS AND ANALYSIS

This present study was initiated in order to update the epidemiology profile of precancerous and cancerous lesions in Cameroon. During the study, different results were obtained:

3.1 Part I: Sample Study Profile

The study cohort was made up of 1443 women aged 15 to 65 years old. The most representative group of women were those aged between 25 and 35 years old (48%). Bartlett's test analyses, presented a significant P value data (0.025). More women aged between 35-40 were very representative among all age group of this study.

A high percentage (63.01%) of polygamous group was recorded in Yaounde, while Mokolo presented almost the same profile for different marital status. Nyete on the other hand presented a descending percentage from none, monogamous, finally to polygamous.

Single women were more represented in Nyete (40.7%) meanwhile married ones from a polygamous system were more represented in Mokolo (31.9%) and Yaoundé (28.5%); with a representative P Values < 0.001.

Primigravida women have constituted the majority of women from Yaoundé (61.5%) meanwhile. Non gravida and multigravida women were more frequent in Nyete and Mokolo localities. The three other pregnancies profile were almost evenly distributed. At Nyete, the most representative population was big gravid women (36.5%), closely followed by the multiple Gravid (35.57%). The women of Mokolo presented a low percentage of pregnancies profile with the most representative being none gravid women as in Yaounde, but closely follow by big gravid women.

3.2 Part II: Cytological Aspects of Cervical Smears

3.2.1 Slides observations according to the 2001 Bethesda system

Forty three (43) slides out of 1443 provided an unsatisfactory result as presented in Table 2. Five pathogenics species were isolated from samples namely: *Trichomonas vaginalis*, *Gardnerella vaginalis*, *Herpes simplex*, *Aspergillus spp*, and *Candida albicans*. Cells alterations observed after performing papanicolau test presented NIL/M (135±90); ASCUS (45±19); ASC-H (48±8); LSIL (32±5.2) and HSIL (11±4.2). ANOVA test presented a Non significant P value (0.3252) as presented in Table 2. High grade squamous intraepithelial lesion (HSIL) was more observed in the centre region, with a high representative of Low grade squamous intraepithelial lesion (LSIL); while (ASC-H) Atypical Squamous Cell indicating High grade lesion, was more representative in the Far North region. The South region represented by Nyete town showed high rate of LSIL more than Mokolo, in the Far North region.

Table 1. Sociodemographic data

Age range	NYETE	MOKOLO	YAOUNDE	Mean ± SD	P values
Ages					
[15-20] (n=28)	18 (64.2%)	3 (10.7%)	7 (25.0%)	9.3±4.485	
[20-25] (n=121)	54 (44.6%)	24 (19.8%)	43 (35.5%)	40.3±8.7	
[25-30] (n= 333)	181(54.3%)	51 (15.3%)	101(30.3%)	111 ±7.8	
[35-40] (n=150)	156 (44.6%)	79 (19.8%)	111 (35.5%)	115.3±22.3	0.001
[40-45] (n=157)	29 (19.3%)	27 (18.0%)	94 (62.6%)	50±22	
[45-50] (n=115)	8 (5.1%)	49 (31.2%)	100 (63.6%)	52.3±26.6	
>=50 (n=193)	13 (11.3%)	32 (27.8%)	70 (60.8%)	38.3±16.7	
Civil status					
Single	180 (37.04%)	57 (18.1%)	117 (18.2%)	118 ± 35.5	
Divorced	12 (3.29%)	16 (5.08%)	28 (4.3%)	18.6 ± 74.8	0.0022
Married	287(59.05%)	213(67.6%)	440 (68.6%)	313.3 ± 66	
Widow	7 (1.44%)	29 (9.21%)	56 (8.7%)	30.67 ± 14	
Marital status					
No married	198 (40.7%)	101 (31.9%)	183(28.5%)	160.7 ± 30	
Monogamous	262 (53.9%)	160 (50.6%)	320 (49.9%)	247.3 ± 46	0.04
Polygamous	26 (5.35%)	55(17.4%)	138 (21.53%)	73 ± 33.5	
Education					
None	145 (29.8%)	58 (18.3%)	139 (21.6%)	114 ± 28.05	
Primary	76 (15.6%)	68 (21.5%)	128 (19.9%)	90.6 ± 18.8	0.2
Secondary	154 (31.6%)	114 (36.08%)	243 (37.9%)	170.3 ±38.1	
Superior	111 (22.8%)	76 (24.05%)	131 (20.44%)	106 ± 16.07	
Jobs					
Administration	28 (28.5%)	17 (17.3%)	53 (54.0%)	49 ±17.9	
Informal sector	95 (55.5%)	26 (15.2%)	50 (29.2%)	85.5±31.8	
Teacher	40 (20.5%)	53 (27.1%)	102 (52.3%)	97.5±35.1	
Home	23 (21.7%)	34 (32.08%)	49 (46.2%)	53 ±18.4	0.0010
Medical personnel	7 (6.80%)	32 (31.07%)	64 (62.1%)	51.5±20.7	
Household	254 (36.2%)	147 (20.9%)	300 (42.80%)	350.5±21.1	
Cultivators	32 (82.05%)	0 (0 .0%)	7 (17.9%)	19.5±9.4	
Student	7 (233%)	6 (20,0%)	17 (56.6%)	15±5.5	

Table 2. Results FCV according to the Bethesda System 2001

FCV Results	Frequency			Total	Percentages	
	Mokolo	Niete	Yaounde			
Satisfactory	306 (21.8%)	470 (33.5%)	624 (44.5%)	1400	97.02%	
Unsatisfactory	10 (23.25%)	16 (37.2%)	17 (39.53%)	43	2.98%	
Presence of micro-organisms:						
<i>Trichomonas vaginalis</i>	3	1	2	6	0.4%	
<i>Candida albicans</i>	356	430	614	1390	99.28%	
<i>Herpes Simplex</i>	1	0	1	2	0.14%	
<i>Gardnerella Vaginalis</i>	0	0	1	1	0.07%	
<i>Aspergillus</i>	1	0	0	1	0.07%	
Cells alterations observed						
Cells abnormalities	NIL/M (n=994)	ASCUS (n=136)	AGCUS (n=143)	LSIL (n=95)	HSIL (n=32)	P value
NYETE	9.1	16.9	22.4	32.6	21.9	
MOKOLO	13.3	21.3	40.6	24.2	18.8	0.002*
YAOUNDE	77.6	61.8	37.1	43.2	59.4	
Frequency	71	9.7	10.2	6.8	2.3	
Mean ± Std. Error	135±90	45±19	48±8.0	32±5.2	11±4.2	

*Significant

ASCUS: Atypical squamous cells undetermined significance

ASC-H Atypical Squamous Cell evocating High grade lesion

AGCUS: Atypical glandular cells undetermined significance

LSIL: Low grade squamous intraepithelial lesion

HSIL: High grade squamous intraepithelial lesion

NIL/M: No evidence of Epithelial lesion or Malignancy

3.2.2 Microscopy observations of smears

The Fig. 1, presents various uterine cells alterations according to papanicolau test. Fig. 1b, presents inflammatory cells due to various infections with presence of polynuclear neutrophils. Fig. 1c presents a koilocyte that is a squamous epithelial cell that has undergone a number of structural changes, which occur as a result of infection of the cell by HPV. These changes occur and can occasionally lead to cervical intraepithelial neoplasia, and if left untreated, some may eventually progress to malignant cancer. In Fig. 1d, we observed *Candida albicans* that is almost universal in low numbers on healthy adult skin and *C. Albicans* is part of the abnormal flora of the mucous membranes sometimes.

3.2.3 Cells abnormalities and first sexual intercourse

Table 3 presents the relationship between of precancerous lesions and first sexual intercourse. The prevalence of these lesions was higher in women less than 15 Years (57.4%). Women with early intercourse presented about 57% of lesions observed during this study. This was also observed among women under 19 years of age. The situation is different in women who had first intercourse at age greater than 25 years (5%).

3.2.4 Lesion in relation to multiple sexual partners

Cytological analyses showed that, women with more than 5 sexual partners had more

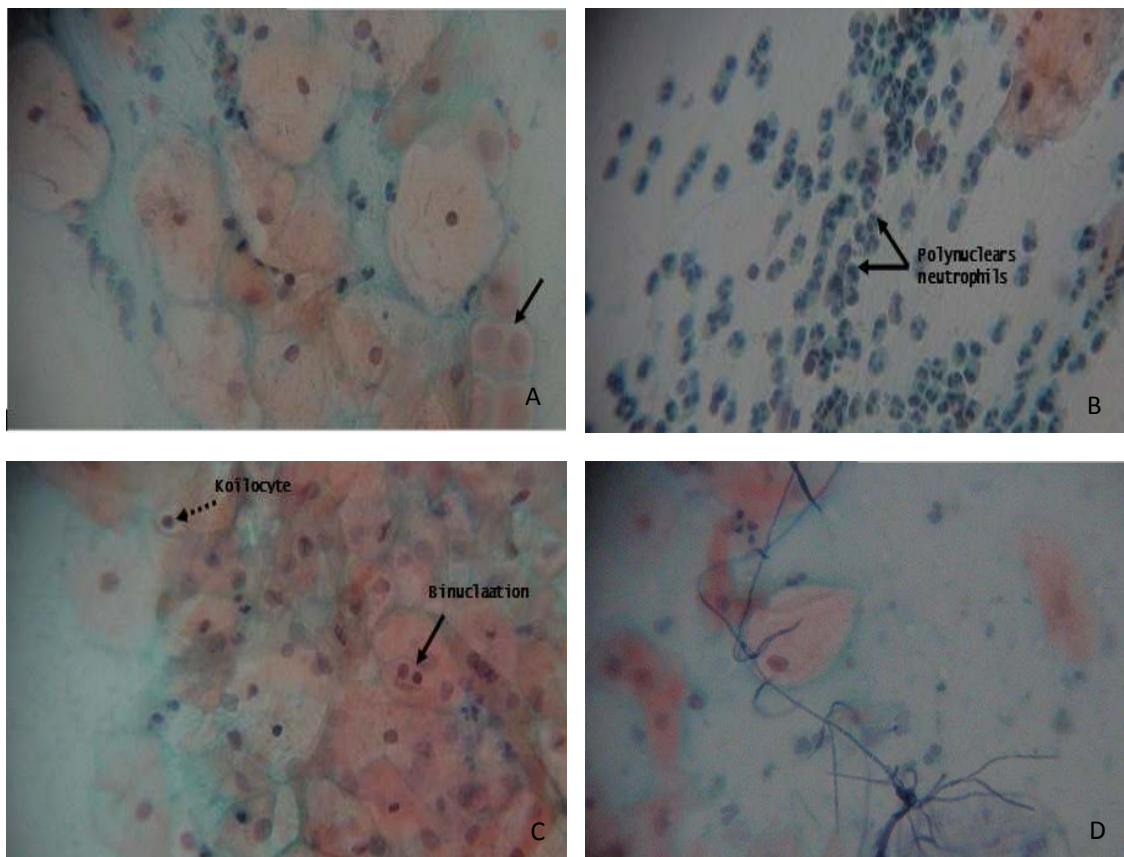


Fig. 1. Cells abnormalities (Via Papanicolau coloration *20)
 a- Abnormalities cells presenting High grade squamous intraepithelial lesion (HSIL)
 b- Inflammatory aspects of cervical cells
 c- Abnormalities cells presenting Low grade squamous intraepithelial lesion (LSIL)
 d- *Candida albicans* on pap smear microscopy observation
 r^2 = determination coefficient

Table 3. Early intercourse and precancerous lesions

Ages	ASCUS	AGCUS	LSIL	HSIL
<15 years	22.7	27.3	23.4	11.7
[15-19]	6.2	23.8	14.8	2.1
[20-24]	12.4	0.4	0.2	0.7
>25	3.1	2.2	0.3	0.6
r ²	0.2	0.3	0.4	0.7

r² = determination coefficient

Table 4. Rate of lesions related to sexual partners number

	1	2	3	4	5	>5
NIL/M	78.8	66.1	63.3	81.0	58.0	59.7
ASCUS	10.3	10.0	11.2	7.0	10.7	7.4
AGCUS	8.9	8.7	13.6	4.9	7.1	19.3
LSIL	1.9	13.0	11.8	4.9	14.3	6.3
HSIL	0.0	2.2	0.0	2.1	9.8	7.4
r ²	0.91	0.94	0.97	0.99	0.90	0.98

ASCUS: Atypical squamous cells undetermined significance

AGCUS: Atypical glandular cells undetermined significance

LSIL: Low grade squamous intraepithelial lesion

HSIL: High grade squamous intraepithelial lesion

NIL/M: No evidence of Epithelial lesion or Malignancy

r² = determination coefficient

Table 5. Cervical lesions according and pregnancy profile

	0	1	2	3	4	5	>5
NIL/M	12.3	8.8	8.9	10.4	10.3	10.3	39.2
ASCUS	1.5	11.0	17.6	15.4	25.7	25.7	2.9
AGCUS	12.6	6.3	7.7	7.7	12.6	18.9	34.3
LSIL	7.4	4.2	16.8	5.3	25.3	28.4	12.6
HSIL	0.0	6.3	0.0	46.9	12.5	15.6	18.8
r ²	0.03	0.005	0.52	0.16	0.10	0.63	0.36

ASCUS: Atypical squamous cells undetermined significance

AGCUS: Atypical glandular cells undetermined significance

LSIL: Low grade squamous intraepithelial lesion

HSIL: High grade squamous intraepithelial lesion

NIL/M: No evidence of Epithelial lesion or Malignancy

r² = determination coefficient

HSIL (7.4%), directly followed by those with more than one partner but less than 5. Among women with less than 5 sexual partners, AGCUS (19.3%) was more frequent, followed by the LSIL (11.8%). Finally, women with one sexual had less HSIL. A high rate of AGCUS was observed in this group.

3.2.5 Cells abnormalities and number of pregnancies

Women who had not been pregnant before mature age, showed no High grade squamous intraepithelial lesion at around 7.4%. The number of HSIL increased consequently with an increase in number of pregnancies. Women with one pregnancy had more ASCUS (11 %) than women with more than 5 pregnancies'. The increase in the number of pregnancies' was significant (P values= 0.02). Around 46% of women with three partners had HSIL.

3.2.6 Cells abnormalities and age at first pregnancies

Table 6.

	[10-15]	[15-20]	[20-25]	[25-30]
NIL/M	8	86.8	82.1	54.3
ASCUS	17.6	4.1	6.1	22.3
AGCUS	52	0.7	7.9	11.2
LSIL	18.4	6.8	3.2	8.2
HSIL	4	1.6	0.8	4.1
r ²	0.9	0.8	0.07	0.5
P value	0.008	0.01	0.6	0.16

* r² = determination coefficient

ASCUS: Atypical squamous cells undetermined significance

AGCUS: Atypical glandular cells undetermined significance

LSIL: Low grade squamous intraepithelial lesion

HSIL: High grade squamous intraepithelial lesion

NIL/M: No evidence of Epithelial lesion or Malignancy

Table 7. A/ Contraceptives methods and lesions

	Non	Injection	Mixte	Implant	Oral	IUD
NIL/M	62.7	65.3	51.2	49.3	69.4	83.7
ASCUS	22.7	17.6	2.4	3.5	5.6	4.8
ASC-H	13.1	3.0	17.1	21.5	5.6	8.4
LSIL	1.2	10.1	25.6	22.2	8.3	2.0
HSIL	0.4	4.0	3.7	3.5	11.1	1.1
r ²	0.65	0.91	0.55	0.59	0.81	0.90
P value	0.2	0.01	0.14	0.12	0.03	0.01

r² = determination coefficient

3.2.7 Lesions and contraception

It is known that, taking birth control pills for 5 or more years increases the likely wood of developing cervical cancer. The longer you use them, the higher the risk. The risk tends to reduce over time when you stop taking pills. Women using mixed contraceptive methods had 54% of HSIL, same as those using Intra Uterine Device (36.5%). Women using injections had about 44.6% of HSIL and those using ORAL contraceptives had 50.3% of HSIL. While LSIL were not significant with respectively for NORPLAN (37.8%); ORAL contraceptive 24.5% and 24.3% (IUD). All the above mentioned distribution was significant.

3.2.8 Cells abnormalities and drug habit

Tobacco smoking, is sometimes involved and presented as the most important risk factor for cervical cancer development worldwide, responsible for 60 000 cases. Other factors such as alcohol consumption and diet have not yet been well established as risk factors but are suspected. The aim of this part of the study was to evaluate the contribution of alcohol and tobacco to the development of cervical cancer. We observed significant data (P value < 0.005). Observation presented more than 3.3% of HSIL among women drinking alcohol and 1.7% among women smoking. Some LSIL were also observed; 16.6% for alcohol drinkers' and 2% for smokers.

3.2.9 Cells abnormalities and microbial infections

Table 9 presents genital infections according to Pap smear technique. Various cytopathic effects of vaginal pathogens were observed. *Trichomonas vaginalis* infection observed showed a significant results (P value= 0.003) although, it was only observed on two cases of LSIL (50%) and HSIL (33.3%). Another viral

cytopathic effect consistent with *herpes simplex* virus on a pap test presents correlation with cervical cells lesions (r²=0.8). A variety of bacteria, fungi, and viruses was identified in this study. Ubiquitous microorganism such as *Candida albicans* was present, but not significant results were obtained.

Table 8. Cells abnormalities and drug habits

	Nicotinism	Alcoholism	P value
NIL/M	74.7	57.3	
ASCUS	10.7	12.9	
AGUS	9.3	11.2	< 0.005
LSIL	2	16.9	
HSIL	3.3	1.7	
r ²	0.96	0.98	

ASCUS: Atypical squamous cells undetermined significance

AGCUS: Atypical glandular cells undetermined significance

LSIL: Low grade squamous intraepithelial lesion

HSIL: High grade squamous intraepithelial lesion

NIL/M: No evidence of Epithelial lesion or Malignancy

Table 9. Rate of lesion according to microbial infections

	TV	CA	HS	GV	A
NIL/M	16.7	71.4	0.0	0.0	0.0
ASCUS	0.0	9.8	0.0	0.0	0.0
ASGCUS	0.0	10.3	0.0	0.0	0.0
LSIL	50.0	6.5	50.0	100.0	0.0
HSIL	33.3	2.0	50.0	0.0	100.0
r ²	0.9	0.02	0.8	0.4	0.2
P value	0.003	0.7	0.01	0.2	0.3

TV: *Trichomonas vaginalis*

CA: *Candida albicans*

HS: *Herpes simplex*

GV: *Gardnella vaginalis*

A: *Aspergillus*

4. DISCUSSION

In order to identify factors responsible for the upsurge of cancerous lesions in Cameroon, microscopy analyses were performed, the first part of this current study was to explore bacterial vagina flora. *Trichomonas vaginalis* (0.4%) is one of the most important cofactors able to amplify appearance of precancerous lesions as we observed in this study, correlated with

observation made by Sorvillo et al. observation [9]. *T. vaginalis* infection is the most prevalent nonviral STI, worldwide. The World Health Organization estimates that its prevalence ranges from 170 million to 190 million cases worldwide each year (the estimated prevalence in the United States is 8 million cases per year) [10]. Besides *T. vaginalis*, Herpes simplex infection is also co factor of upsurge of cervical cancer. This is correlated to other study; several independent studies suggest that HSV-2 infections correlate with a higher than normal incidence of cervical cancer [11–13]. *Candida albicans* (80.78%) is the most representative microorganism observed during this study. *Candida albicans* is a member of the human microbiome. its resides as a lifelong, harmless commensal and can cause infections that range from superficial infections of the skin to life-threatening systemic infections [14]. It is generally observed in precancerous lesions, as demonstrated by Marina et al., There is evidence of microorganism association between candida and cancer. *Candida* has a greater likelihood of undergoing malignant transformation than those that are not infected [15]; *Gardnerella vaginalis* although represented at a lower rate of 0.07%, is also involved among microorganisms responsible for the appearance of precancerous lesion as Gilet et al., presented in their study [16–18]. Cells abnormalities were distributed as follow; NIL/M (71%), ASCUS (9.7%), ASGUS (10.2%), LSIL (6.8%), HSIL (2.3%). These distributions have also been observed in many other studies [1,6,18–20]. A Study carried out by Ngabo et al. in Rwanda, showed that; cytological abnormalities were 22 and 11 % respectively (including 2 % with high-grade squamous intraepithelial lesions, HSIL) decreasing with age [21].

Age of First sexual intercourse presented about 57% of cervical lesions. This is due to the fact that, the earlier you start having sex and the more men you have sex with, the more likely you are prone to pick up an infection. Louie showed that, Early age at first sexual intercourse (AFSI) has been associated with an increased risk of precancerous lesions, a sexually transmitted infection (STIS), that is susceptible to all women is responsible for virtually all cases of invasive cervical cancer [22]. For sexual partners and multiple full-term pregnancies; we observed that: 65% attained secondary or tertiary education. Most of the women in the study were self-employed with various trades. Though employed in public institutes or private sectors most were

low income earners, this present a high level of poverty amongst our patients. Poverty contributes by making women dependent on their husbands financially. Where these are not forthcoming, sexual promiscuity may result, with its contributing to short- and long-term cervical cancer-related risks. Women with early pregnancies [9-14] presented more HSIL (4%); LSIL (18%). This is also observed in women with HSIL (0.15%), LSIL (0,68%) as observed in different others studies [14-19],. Women who got pregnant after 30 years presented HSIL (8.62%); LSIL (6.89%). Women age among, presented HSIL (0.7%); LSIL (3.15%). The general distribution of this part of analyses showed significant differences with a P value<0.001 [19-24]. Louie et al. showed that, Age at first pregnancy and AFM were both directly correlated with early age at first sexual intercourse (AFSI) in these populations ($P<0.001$). Approximately, 92% of women reported AFSI to be the same as age at first marriage (AFM). One-quarter of women reported Age at first pregnancy (AFP) to be the same as AFSI. Cumulatively, 62.4% of women reported giving birth within the first year of sexual intercourse [23]. Women using mixt contraceptive methods presented 54% of HSIL, the same situation was observed with women using Intra Uterine Device (36.5%). Hannaford presented that, the use of contraceptive methods could be associated with an increase in cervical cancer [24]. Women using injections presented around 44.6% of HSIL and those using ORAL tablets presented 50.3% of HSIL. While LSIL were not negligible respectively 37.8% (NORPLAN); 24.5% (ORAL) and 24.3% (IUD). All these aforementioned distributions were significant (P value < 0.001).

Results of this study showed that; consideration of the issues, and examination of the available data, it is concluded that women who use oral contraceptives are possibly at higher risk of invasive cervical cancer; users of barrier methods probably have a low risk; and that users of other methods of contraception do not have an altered risk.

Few published studies on the association between alcohol consumption and risk of cervical cancer, presented contradictory or inconclusive results, In our study, more than 31% of individuals drinking alcohol frequently and in large quantity, the higher rate of consumption is due to psychosocial problems as presented by

Katharine and collaborators [25]. Women drinking alcohol frequently had presented precancerous lesions. The distribution of these lesions among women drinking alcohol was presented in table VII. Women with atypical squamous cells undetermined significance (AGCUS) showed 9.3% among alcohol consumers. This suggests that for all alcohol consuming, they are not predispose for AGCUS and equally a greater rate with LSIL (Low grade squamous intraepithelial lesion) (16.9%). HSIL (High grade squamous intraepithelial lesion) (3.3%) was also present. Scientists permanently tried to decide whether alcohol can act for the cervical cancer appearance, in this study the statistical analyses presented significant results, based on P values analyses. It is possible to imagine that combination of all these factors can enhance appearance of cervical cancer.

5. CONCLUSION

This study was initiated to determine factors involved for the appearance of precancerous lesion or cervical cancer in Cameroon using Pap Test. Many factors were identified; their combination in one person could enhance quickly the development of cervical cancer. Post analyses showed that, sexual partner number, the use of IUD and injection as contraceptive method, consumption of alcohol and tobacco were risk factors, responsible for the upsurge of cervical cancer in Cameroon. However, microbial infections have been shown to be a good predisposing factor to the upsurge of precancerous lesions; especially *Trichomonas vaginalis* and *Herpes simplex* infections. During the period of awareness and sensitization campaign, we were surprised to find that fewer women (10%) were really unaware of the existence of Pap test; while nearly 90% of women did not know what Pap test is. This raise the situation concerning health system organization, and lack of health information system.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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