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RESEARCH ARTICLE

HISTOPATHOLOGICAL PROFILE OF CERVICAL BIOPSIES RECEIVED AT THE ANATOMIC PATHOLOGY LABORATORY OF LAQUINTINIE HOSPITAL IN DOUALA, CAMEROON

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Abstract

Background:Cervical cancer is a type of cancer that develops in the cells of the uterine cervix. It is primarily caused by infection with the human papillomavirus (HPV), transmitted through unprotected sexual intercourse. As a major public health concern, this cancer motivated our study, which aimed to evaluate the histopathological profile of cervical biopsies received at the anatomic pathology laboratory of Laquintinie Hospital in Douala.

Methods: This was a combined retrospective and prospective study conducted over a one-year period, from June 2023 to May 2024. The study sought to provide useful information for policymakers and the scientific community to im prove cervical cancer prevention and treatment strategies.

Results: A total of 124 cervical biopsies and 31 hysterectomy specimens from f emale patients were analyzed.Histopathological results revealed a precancerous lesion prevalence of 38.8%,distributed as follows:31.0% CIN1 (mild dysplasia) ,2.6% CIN2 (moderate dysplasia), and 5.2% CIN3 (severe dysplasia).The prevalence of cancerous lesions was 29.1%, including 22.6% carcinoma and 6.5% adenocarcinomas. The
patients ages ranged from 27 to 83 years. Precancerous lesions (particularly CI N1) were more common in women aged 46–55 (33.3%). Regarding cancerous lesions, adenocarcinomas were predominant in women aged 46–55, while carcinomas were more frequent in those over 56.

Conclusion:Additionally, alcohol consumption appeared to be an associated factor: the prevalence of carcinomas was 26.6% among women who consumed alcohol, compared to 7.1% for adenocarcinomas. As for precancerous lesions, mild dysplasia was more frequent among alcohol-consuming women (26.6%), compared to moderate (3.0%) and severe dysplasia (5.2%).

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Introduction:-

Cancer is a pathology characterized by the anarchic, uncontrolled, and relentless proliferation of cells. It results from the cells' inability to balance cell division with programmed cell death (apoptosis). This dysregulation disrupts essential cellular activities such as growth, differentiation, and tissue integrity. It can affect most organs (Mareel & Leroy, 2003; Hanahan & Weinberg, 2011).

Cervical cancer is, in terms of frequency, the second most common cancer among women worldwide, after breast cancer. It is primarily caused by a persistent infection with the human papillomavirus (HPV). According to the World Health Organization (WHO), about 500,000 women develop cervical cancer each year, and approximately 270,000 die from it (WHO, 2010). It is the leading cause of cancer-related death among women in many low- and middle-income countries, where 80% of deaths occur (Pierre, 2013).

In Cameroon, the prevalence of cervical cancer is higher than in industrialized countries. This situation is worsened by the lack of strategic policies and programs to fight this cancer, limiting access to screening. Added to this are the lack of information and expertise, the high cost and limited availability of the HPV vaccine, and the lack of early screening services (WHO, 2010).
The natural history of this cancer generally progresses through a sequence of precancerous lesions, due to the persistence of an HPV infection. For each grade of these lesions, there is, over a period of 10 to 20 years, a probability of regression to a normal state or progression to invasive cancer (WHO, 2016).

Various tests allow for the detection of this disease, including screening and diagnostic examinations. Among these, the biopsy remains the gold standard test. However, in practice, there is a noticeable absence of specific preventive programs, even as cervical cancer becomes increasingly aggressive.
It is in this context that the present study was conducted at the anatomical pathology laboratory of Laquintinie Hospital in Douala. It aims to provide an overview and deliver valuable information to decision-makers and the scientific community in order to contribute to the fight against this cancer, both nationally and internationally.

Methods:-

A.Administrative Procedures

The study began with the drafting of a research protocol, followed by a request for ethical clearance from the Institutional Ethics Committee under reference No. 1276/CE/CNERSH/SP. A research authorization was also requested from the management of Laquintinie Hospital of Douala under reference No. 291/AR/MINSANTE/DH.

B. Pre-analytical Procedure

B1. Identification of specimens or samples:

- Patient code, sex, and date of birth
- Prescribing physician’s contact details
- Type and location of the sample
- Date of the sample collection
- Other clinical information

B2. Sample reception:

Samples were received under the supervision of pathologists.

To ensure quality results, we ensured that the volume of fixative was sufficient (at least two-thirds of the total volume), and hysterectomy specimens were sectioned into 1 to 2 cm slices to allow deep tissue penetration of the fixative.

B3. Sample preparation:

Histological analyses focused on biopsies and surgical specimens (partial or total hysterectomies). The steps were as follows:

- Macroscopic examination
- Dehydration using increasing alcohol concentrations
- Paraffin embedding
- Mounting on cassettes
- Microtome sectioning (microtomy)

- Mounting of blank slides
- Deparaffinization
- Hematoxylin-eosin (HE) staining and slide mounting

C. Analytical Procedure
- Observation under an optical microscope (LEICA DM 1000) by a pathologist
- Classification of lesions according to the CIN classification system
- Preparation of the diagnostic report

D. Post-analytical Procedure
Results were delivered directly to patients at the hospital. Those requiring medical care were referred to a gynecologist.

E. Data Analysis
Data were entered into Microsoft Excel 2019 for storage, statistical analysis, and graphical representation. IBM/SPSS software version 21.0 was used for statistical analysis. The chi-square test (χ^2) was used to compare variables. A p-value < 0.05 was considered statistically significant.

F. Quality Control
Quality assessment of slides is essential to ensure the reliability of results according to the recommended CIN classification system. This evaluation includes two phases:

1. Pre-analytical phase: quality of the specimen
- Incomplete clinical information
- Incorrect labeling
- Diluted or insufficient quantity of formalin
- Incomplete immersion of specimens
- Other factors that may alter quality

2. Analytical phase: cellular composition and interpretability
A smear is considered non-interpretable if:
- Staining is inadequate
- Slide mounting is poorly done
- The slide is damaged or dirty
- The tissue section is poorly made

Results:-

A. Sociodemographic Characteristics
The patients came from several regions of Cameroon. The Wouri department was the most represented (89%), with Douala III leading (31.6%), followed by Douala V (21.3%), Moungo (4.9%), Centre (1.9%), Southwest (1.3%), and South (0.6%).
The average age of the patients was 50.4 ± 11.3 years, with a minimum of 27 years and a maximum of 83 years. The most represented age group was 45 to 55 years (42.6%), while the least represented was 25 to 35 years (5.8%).

Marital status:60.0% were married ; 28.4% were single ;11.6% were widowed. Professionally, housewives made up the majority with 79 patients (51.0%).Regarding parity: The majority of patients had 2 to 3 children (pauciparous): 55 women (35.5%) ;The minority had more than 7 children (grand multiparous): 13 women (8.4%).

Table 1:- Sociodemographic Characteristics.

Variable	Frequency	Percentage
Place of residenceof our target population		
Douala III	49	31.6%
Douala V	33	21.3%
Douala I	17	11.0%
Douala II	15	9.7%

Douala IV	12	7.7%
Douala VI	12	7.7%
Centre	3	1.9%
Sanaga Maritime	3	1.9%
Moungo	8	4.9%
Southwest	2	1.3%
South	1	0.6%
Distribution of our paricipants by age group		
25–35 years	9	5.8%
35–45 years	36	23.2%
45–55 years	66	42.6%
56+ years	44	28.4%
Marital status		
Single	44	28.4%
Married	93	60.0%
Widowed	18	11.6%
Socio professional categories		
Housewife	83	53.5%
Student	2	1.3%
Informal sector	42	27.1%
Formal sector	28	18.1%
Parity		
Nulliparous	16	10.3%
Primiparous	21	13.5%
Multiparous	50	32.3%
Grand multiparous	13	8.4%

B. Clinical Data, Risk Factors, and Sample Types

Regarding alcohol consumption, the majority of participants reported consuming alcohol (63.9%), compared to 36.1% who did not. Smoking was rare: only 1.9% of participants were smokers, while 98.1% were non-smokers.

Additionally, 22.6% of patients reported having other illnesses, while 77.4% were unaware of any comorbidities. The most common comorbidity was hypertension (31.4%), followed by HIV (28.6%).

Concerning the types of samples, all biopsy or hysterectomy specimens were preserved in 10% diluted formalin solution. Cervical biopsies predominated, representing 80.0% of samples, while hysterectomies accounted for only 20.0%.

C. Results and Prevalence

Histological analysis of the 155 cervical biopsy samples revealed:

32.3% were normal (NILM – Negative for Intraepithelial Lesion or Malignancy)

38.8% were precancerous lesions: 31.0% CIN1 (mild dysplasia) ;2.6% CIN2 (moderate dysplasia) ;5.2% CIN3 (severe dysplasia)

29.1% were cancerous lesions: 22.6% carcinoma ;6.5% adenocarcinoma

Table 2:- Risk Factors and Sample Types.

Variable	Frequency	Percentage
Alcohol consumption		
Yes	99	63.9%
No	56	36.1%
Smoking		
Yes	3	1.9%
No	152	98.1%
Other illnesses		
Yes	35	22.6%
No	120	77.4%
Comorbidities		
Diabetes	1	2.9%
Hypertension (HTN)	11	31.4%
HTN + Diabetes	2	5.7%
HTN + HCV	1	2.9%
HTN + HIV	2	5.7%
Hepatitis B	1	2.9%
Gastric disease	2	5.7%
Myoma	1	2.9%
Obesity	4	11.4%
HIV	10	28.6%
Sample		
Biopsy	124	80.0%
Hysterectomy	31	20.0%

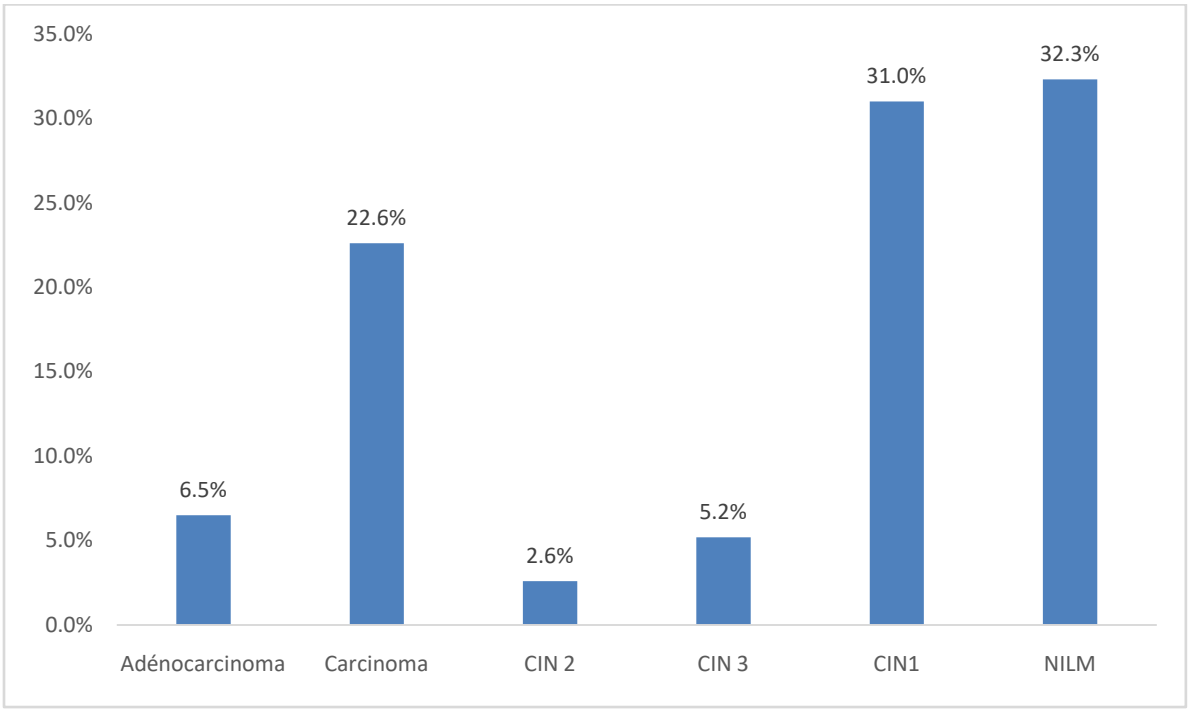

Figure 1:- Distribution of participants according to histopathological results.

D. Analysis of Risk Factors Influencing the Prevalence of Precancerous Lesions

Several associations were examined to determine whether precancerous and cancerous lesions were linked to specific risk factors. The chi-square test was used to compare variables, with a significance level set at $p < 0.05$. Two associations were particularly noteworthy.

Histological abnormalities and sample type:

The chi-square test showed a p-value < 0.05, indicating that the type of sample had a significant association with the diagnosis of precancerous and cancerous lesions.

Histological abnormalities and alcohol consumption:

Mild dysplasia was more frequent in women who consumed alcohol (26.6%) compared to moderate (3.0%) and severe dysplasia (5.2%). Similarly, the prevalence of cancerous lesions was 26.6% for carcinomas in alcohol consumers, versus 7.1% for adenocarcinomas.

Conclusion:-

Alcohol consumption was identified as a risk factor significantly associated with the appearance of precancerous and cancerous lesions ($p < 0.05$).

Table 3:- Analysis of Risk Factors that may affect the Prevalence of precancerous Lesions.

Variable	**Frequency**			**P value**
Histological anomalies and sample type				
	Lesion Type		Total	0.006
	Biopsy	**Hysterectomy**		
Adenocarcinoma	6 (4.8%)	4 (12.9%)	10 (6.5%)	
Carcinoma	32 (25.8%)	3 (9.7%)	35 (22.6%)	
CIN1	42 (33.9%)	6 (19.4%)	48 (31.0%)	
CIN2	3 (2.4%)	1 (3.2%)	4 (2.6%)	
CIN3	7 (5.6%)	1 (3.2%)	8 (5.2%)	
NILM	34 (27.4%)	16 (51.6%)	50 (32.3%)	
Total	124 (80.0%)	31 (20.0%)	155 (100%)	
Histological anomalies and alcohol consumption				
	Lesion Type		**Total**	0.029
	Alcohol No	**Alcohol Yes**		
Adenocarcinoma	3 (5.4%)	7 (7.1%)	10 (6.5%)	
Carcinoma	9 (16.1%)	26 (26.6%)	35 (22.6%)	
CIN1	19 (33.9%)	29 (29.3%)	48 (31.0%)	
CIN2	1 (1.8%)	3 (3.0%)	4 (2.6%)	
CIN3	0 (0.0%)	8 (5.2%)	8 (5.2%)	
NILM	24 (42.9%)	26 (26.3%)	50 (32.3%)	
Total	56 (36.1%)	99 (63.9%)	155 (100%)	

Discussion:-

Prevalence of Precancerous and Cancerous Lesions

This retrospective and prospective analytical study of 155 samples from patients received at the anatomical pathology laboratory of Laquintinie Hospital revealed a prevalence of 38.8% for precancerous cervical lesions, distributed as follows: CIN1 (mild dysplasia): 31.0% ,CIN2 (moderate dysplasia): 2.6% ,CIN3 (severe dysplasia): 5.2% ,As for cancerous lesions, the prevalence was 29.1%, comprising:Carcinomas: 22.6% ,Adenocarcinomas: 6.5%

These results closely align with data from Cameroon, notably the 2022 **Cancer Report**, which indicated a 33.4% prevalence of cervical cancer in the country, with 392 diagnosed cases across key anatomical pathology and hematology-oncology departments.

Histological Anomalies and Age Group

The average age in our study population was 50.4 ± 11.3 years, close to the 41 ± 10.6 years observed by Kemfang et al. (2015) in Cameroon. Patient ages ranged from 27 to 83 years. We observed a high prevalence of precancerous lesions (especially CIN1) among women aged 46–55 years (33.3%). Adenocarcinomas were more common in the same age group, while carcinomas were more frequent among women over 56 years. These findings are consistent with Tebeu et al. (2000), who reported that precancerous lesions mainly affected older women in Bali (Northwest Cameroon).These results point to a trend toward younger onset of precancerous lesions, highlighting the need to reevaluate screening start age. Our study supports the importance of early screening before age 21 and after age 65.

Histological Anomalies and Sample Type

The chi-square test showed a significant association ($p = 0.006$) between the type of sample and the diagnosis of precancerous and cancerous lesions. This is in line with findings in the 2022 Cancer Scientific Report, which emphasized that biopsy is a near-definitive diagnostic method for cervical cancer.

Histological Anomalies and Alcohol Consumption

Among women who consumed alcohol, the prevalence of carcinomas was 26.6%, versus 7.1% for adenocarcinomas. For precancerous lesions, mild dysplasia was more frequent (26.6%) in alcohol consumers, compared to moderate (3.0%) and severe (5.2%) forms.

The chi-square test confirmed a significant association with a p-value of 0.029. This supports studies by Ciraru et al. (1999) and Hildesheim et al. (2001), which showed that the risk of developing cancer is twice as high among smokers and alcohol consumers. Tobacco smoke and alcohol contain carcinogenic substances that impact various organs, including the cervix.

Recommendations:-

To reduce the incidence of this pathology, we propose the following actions:

Improve communication:

Caregivers should be prepared to provide accurate information about the patient and the medical history when submitting biopsy or hysterectomy specimens.

Lower examination costs:

Review and reduce the cost of diagnostic tests, which remain high and are often inaccessible to a large portion of the population.

Promote laboratory documentation practices:

Encourage and facilitate the systematic completion of laboratory registers.

Strengthen systematic and early screening:

Implement early and systematic screening of precancerous lesions, especially among at-risk populations.

Our study highlights the urgency of implementing these measures, which, if enforced, would help prevent the progression of precancerous lesions into invasive cancer — a major threat to women's health.

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