

**Histopathologic patterns of cervical Lesions at Jimma University Medical Center,
Jimma, South west Ethiopia: A Two Year Retrospective Cross-Sectional study**



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**A Research Paper Submitted to Jimma University, Department of Pathology in Partial
Fulfillment for the requirement of specialty in human Anatomic pathology**

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Abstract

Background: The cervix is the lower portion of the uterus which connects this organ to the vagina through the endocervical canal. Due to the susceptibility of the epithelium of the cervical transformation zone to infection by oncogenic human papilloma virus (HPV), diseases of the cervix account for a burden of morbidity and mortality that is disproportionate to its size. Despite the introduction of cervical screening programs, cancer of the cervix remains one of the most common cancers.

Objective: The objective of this study was to determine histopathological patterns of cervical lesions, seen at pathology department of Jimma university medical center, from 12thSeptember 2018 to 11thSeptember 2019.

Methods: Data was collected from 469 eligible biopsies reports of cervical lesions and then cleaned, coded and entered into Epidata v3.1 and exported to SPSS version 26 for analysis. Cross tabulation, chi square test and logistic regression with multivariate analysis were done to look for associations between the study variables. Those variables with a *P*-value <0.25 in a binary logistic regression were recruited for multivariable logistic regressions. The findings were presented using text, tables and charts.

Result: In this study, cervical cancer was the most common (71%) cause of cervical lesions that submitted for histopathologic diagnosis with the peak age of incidence in 4th and 5th decades. Squamous cell carcinoma was the most frequent cervical cancer diagnosed during the study period accounting for 95.8% of 333 cancerous cases followed by adenocarcinoma (3.3%) and carcinoma insitu (0.6%). High grade squamous intraepithelial lesion was the most frequently diagnosed precancerous lesion accounting for 67.5% cases. Endocervical polyp was the most commonly diagnosed benign lesion accounting for 59.3% cases. Age and residency were the most statistically significant predictors of cervical cancer.

Conclusion: The Maximum age distribution of cervical lesions was in 41-50 years age range. Most cervical lesions were Precancerous and cancerous cervical lesions. Squamous cell carcinoma was the most frequent cervical cancer. High grade squamous intraepithelial lesion was the most frequently diagnosed precancerous cervical lesion. Endocervical polyp was the most commonly diagnosed benign cervical lesion.

Keywords: histopathology, Cervical Lesions, Cervical Cancer, Jimma University, Ethiopia.

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Abbreviations and Acronyms

AFCRN	African cancer registry network
AOR	Adjusted Odds Ratio
BMA	Bone marrow Aspiration
CA	Cancer/carcinoma
CIN	Cervical Intraepithelial Lesions
EFMOH	Ethiopian Federal Ministry of Health
FIGO	International Federation of Gynecology and Obstetrics
FIG	Figure
FNAC	Fine Needle Aspiration Cytology
GLOBOCAN	Global Cancer Incidence, Mortality and Prevalence
H & E	Hematoxylin and Eosin
HIV	Human immunodeficiency virus
HSIL	High-grade squamous intraepithelial lesion
HPV	Human Papilloma Virus
IARC	International Agency for Research on Cancer
ICD-O	International Classification of Disease-Oncology
ICO	The Catalan Institute of Oncology
IRB	Institutional Review Board
JUMC	Jimma University Medical Center
JUSH	Jimma University Specialized Hospital
LEEP	Loop Electrical Excision Procedure
LSIL	low-grade squamous intraepithelial lesion
NCCP	National cancer control plan of Ethiopia
PAP	Papanicolaou stain
PMB	Postmenopausal bleeding
SCC	Squamous Cell Carcinoma
SEER	United States Surveillance, Epidemiology, and End Results
SNNPR	Southern Nations, Nationalities, and People's Region
SPHMMC	Saint Paul Hospital Millennium Medical College
SPSS	Statistical Package for the Social Science
STD	Sexually transmitted diseases
STI	Sexually transmitted infection
TASH	Tikur Anbessa Specialize Hospital
UOG	University of Gonder
VIA	Visual inspection with acetic acid
WHO	World Health Organization

1. Introduction

1.1. Background

The cervix is the lower portion of the uterus which connects this organ to the vagina through the endocervical canal. It is divided into a portion that protrudes into the vagina (portio vaginalis) and one that lies above the vaginal vault (supravaginal portion). The outer surface of the portio vaginalis is known as the exocervix or ectocervix, and the portion related to the endocervical canal corresponds to the endocervix. Most of the exocervix is covered by nonkeratinizing squamous epithelium that in childbearing age is composed of three layers: basal cell, midzone (stratum spongiosum), and superficial. The glandular mucosa of the endocervix is formed by a layer of columnar mucus-secreting cells, the area where the squamous and glandular epithelia meet is known as the squamocolumnar junction (1).

The squamocolumnar junction undergoes eversion with the onset of puberty, causing columnar epithelium to become visible on the exocervix. The exposed columnar cells, however, eventually undergo squamous metaplasia, forming a region called the transformation zone (2). The 'transformation zone' is the area where the expected transformation to metaplastic squamous epithelium and abnormal transformation to CIN usually occurs (3).

Range of neoplastic conditions of the cervix arises at or near the cervical transformation zone ranging from precancerous intraepithelial neoplasia, epithelial malignancies (including squamous neoplasia, glandular neoplasia, mixed-type carcinoma, and neuroendocrine carcinoma), mixed epithelial and mesenchymal tumors, mesenchymal tumors, melanocytic tumors, and miscellaneous rare malignancies. Squamous intraepithelial neoplasia may be identified at any age following the onset of sexual activity. It is now well established that Human papilloma virus (HPV) infection is causally related to cervical neoplasia, both preinvasive and invasive disease infection is ubiquitous in young, sexually active women, with a peak frequency of infection in this age group; although infections are usually transient without any associated morphologic abnormality, persistent infection with a single HPV type is highly associated with cervical neoplasia, either concurrently or subsequently (4).

The epidemiology of low-grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL) and Squamous cell carcinoma (SCC) of the cervix follows the epidemiology of HPV infections. HPV infections are very common, affecting up to 80% of women in their early 20s, but being detectable in only 5% in their 50s. More than 40 HPV types infect the cervix, although 13- 15 high-risk (HR) and 4-6 low-risk (LR) types account for the majority of infections. Adenocarcinoma currently comprises 10- 25% of all cervical carcinomas in developed countries, compared to 5- 10% three decades ago. This increase has resulted from a decline in squamous carcinomas secondary to screening programs and better identification of glandular lesions in cervical cytology samples. A potential association with long-term oral Contraceptive use, particularly with progestational agents and with unopposed estrogen use, has been postulated but not proven (5).

Nearly all cervical cancers are caused by persistent infections with one of around 15 carcinogenic types of HPV and the proportion with squamous histology is approximately 70%. Persistent infection with carcinogenic HPV is necessary for carcinogenesis, but not sufficient, and the sojourn time from acquisition through persistence, and hence to development of a cancer precursor, and finally to progression to invasion generally requires decades. Factors associated with greater risk of HPV persistence include HPV type, immunodeficiency, smoking, multiparity, long-term oral contraceptive use, possibly chronic inflammation and/or concurrent sexually transmitted diseases, such as chlamydia, and positive family history. (5).

According to a 5year retrospective study done on 75 cases in Nigeria, cervical cancer has incidence of 65.2% of all gynecological cancers and 13.4% of all gynecological admissions. The majority of the patients were grand multiparous women with a mean parity of 6.8. The modal age range was 60–69 years (38.7%) and the majority (94.7%) of the patients belonged to the low socioeconomic class. SCC of varying differentiation (89.3%) was the commonest histological type seen and adenocarcinoma accounted for only 8.0%. The modes of presentation were post-menopausal bleeding (84.0%), vaginal discharge (72.0%), contact bleeding (63.9%) and abdominal pain (56.2%). Most (89.3%) of the patients presented late, in advanced stages of the disease, and almost all (97.3%) were referred for radiotherapy (6).

1.2. Problem statement

The overall burden of cancer in the world is projected to continue to rise, particularly in developing countries. It is projected that an estimated 21 million people will be diagnosed and 13 million will die of cancer in the year 2030. Although incidence rates for all cancers combined are twice as high in more developed compared to less developed Countries, mortality rates are only 8% to 15% higher in more-developed countries. This disparity primarily reflects differences in cancer profiles and/or the availability of and accessibility to diagnostics and treatment. Similarly, cancers are more often detected at a later stage in less-developed countries, which contribute to the disparity in mortality rates relative to the incidence. Although national cancer control plan of Ethiopia/NCCP/ set ambitious objective to expand the methods of preventive intervention, launching screening test for early detection, and diagnosis and treatment with provision of chemotherapy, surgery and palliative care, the effects on Cervical Cancer take years to show significant decline as observed in the developed nations (7).

Cervical cancer is one of the most common cancers in women with approximately 0.5 million cases worldwide in 2008. Cervical cancers worldwide increased from an estimated 378,000 in 1980 to 500,000 per year in recent years. Reflecting an average annual increase of 0.6%. Approximately 76% of recent cases occur in low-resource nations, with numbers increasing in all but high income countries. The median age at death in wealthier nations is 55 years. The large disparities in incidence and mortality between heavily affected nations in Africa and Asia and lower rates in wealthier North American and European countries is largely attributable to effective programs to detect cancer precursors coupled with infrastructure to clinically manage precursor lesions (5), (8).

Cancer is one of the major non-communicable diseases (NCDs), which include cardiovascular diseases, diabetes and chronic respiratory diseases. Every year NCDs and cancer cause over 60% of total global mortality. According to GLOBOCAN 2018, the global cancer burden has risen to 18.1 million cases and 9.6 million cancer deaths. The incidence and mortality from non-communicable diseases is rising rapidly, while communicable diseases still remain the leading killers in many developing countries. This has resulted in a ‘double burden’ of diseases, which is imposing strain on existing health system (7) (9).

Cancer of the cervix uteri is the 3rd most common cancer among women worldwide, with an estimated 569,847 new cases and 311,365 deaths in 2018. The majority of cases are SCC followed by adenocarcinomas. According to GLOBOCAN 2018, annual cervical cancer cases are 52,633 in east Africa. About 6,294 new cervical cancer cases are diagnosed annually in Ethiopia. Cervical cancer is the 2nd most common female cancer in women in Ethiopia (9) (10).

1.3. Rationale of the Study

In Ethiopia, Cervical cancer is the 2nd most common female cancer. Throughout the world; HPV infections are the most common cause of cervical cancer. From more than 100 different HPV types, infection with HPV 16 and 18 has been associated with more than 70% of cervical cancers. Cervical cancer is a preventable and curable disease. It can be prevented by vaccination and screening and cured if identified at an early stage.

Although high-risk HPV infection is an important cause, only a small proportion of HPV infected women develop invasive cancer implicating presence of co-factors to HPV infection that lead to the development of cervical cancer. According to study carried out in different part of Ethiopia; including the study area, knowledge about cervical cancer is very low. Although NCCP launched Nationwide HPV Vaccinations on the 2016-2019 national cancer control plan of 2016-2020, across primary and secondary school students the effects take years to be seen. Additionally, PAP smears are being conducted in few centers of the country only.

To my knowledge there are no studies done inclusive of the benign cervical conditions on the study area. The clinicopathologic studies done at the study area were conducted ten years ago.

1.4. Significance of the Study

This study augments the clinicopathologic studies done at southwestern Ethiopia, from Histopathologic point of view, including benign cervical conditions. In addition, this study will serve as a baseline for future studies to be carried out at the national or continental level during post HPV vaccination era. The result of this study also serves as input for JUMC, Zonal and Regional health bureaus and Ethiopian Federal Ministry of Health/EFMOH/ in evaluation and monitoring of the screening and preventive strategies.

2. Literature Review

2.1. Cervical pathologies at the Global level

According to GLOBOCAN, 2018, the global cancer burden is estimated to have risen to 18.1 million new cases and 9.6 million deaths in 2018. One in 6 women and one in 5 men worldwide develop cancer during their lifetime, and one in 11 women and one in 8 men die from the disease. In future also incidence of cancer worldwide is expected to rise to 26.4 million with 17 million deaths by 2030 (10).

A study done in Bangladesh on Gynecologic malignancy(GM) showed that Out of the total 185 gynecological cancers diagnosed,120 cases (64.87%) were cervical, 44 (23.78%) ovarian,12 (6.49%) corpus uteri, 7 (3.78%) vulvar, and 2 (1.08%) vaginal cancers. The mean age of the cases was 43.91 ± 12.84 years and ranged from 4 months and 85 years. The mean ages of cervical cancers were 46.64 ± 10 . Majority of the patients were between the fourth and six decades with peak frequency in the fifth decade of life. Squamous cell carcinoma (SCC) was the commonest histopathologic type in cervical and vulvar cancers (11).

A retrospective descriptive study done on Trends in the Incidence of Cervical Cancer over a 14-year period (2000–2013) on 591 women in Jordan, showed that the age at diagnosis ranged between 15 and 97 years, with a median of 50 years. About 46.5% of the cases were of squamous cell carcinoma morphology. Regional cases constituted 9.6%, distant metastatic cases constituted 10.7% and early cancer constituted about 60% of the cases. The incidence of cervical cancer in Jordan is low compared to regional estimates and remained relatively constant (12).

According to a study done in India over a period of 2 years the most frequent condition diagnosed on cervical biopsies and hysterectomy specimens were benign cervical polyp (66.3%), followed by carcinoma (23.7%) and squamous intraepithelial lesion (0.2%). Out of all benign cervical Polyps, occurrence of adenomatous polyp was highest. Incidence of SCC (19.6%) was more as compared to adenocarcinoma (3.7%). The mean age of the SCC was 49.1 years, adenocarcinoma was 43.5 years, squamous intraepithelial lesion was 47.7 years and benign cervical polyp was 44.6 years (13).

Another prospective and retrospective study done in India on Histopathological Spectrum of Premalignant and Malignant Lesions of Uterine Cervix showed that Cervical Intraepithelial Neoplasia (CIN) 1 was diagnosed in 36.1% patients, followed by CIN 2 (33.3%) and CIN 3 (30.6%). Amongst the malignant lesions, SCC was the most common lesion encountered in 85.1% cases. There was a progressive increase in mean age of diagnosis from CIN 1 to invasive carcinoma. Other malignant lesions encountered were adenocarcinoma (8.1%), adenosquamous carcinoma (1.3%) and neuroendocrine carcinoma (5.4%) (14).

A multivariate analysis done in Japan using FIGO staging and histopathology pattern of 251 cases with large cell nonkeratinizing SCC, 29 with keratinizing SCC, nine with small cell carcinoma, 52 with adenocarcinoma (28 pure adenocarcinoma and 24 adenosquamous carcinoma), and four with undifferentiated carcinoma with age of the patients ranged from 20 to 75 years (median, 52 years) showed that adenocarcinoma was an independent and significant prognostic factor (15).

2.2. Cervical Pathologies in Africa

Cervical cancer accounts for 22.5% of all cancer cases in women in Sub-Saharan Africa and the majority of women who develop cervical cancer live in rural areas. According to the WHO, cervical cancer will kill >443,000 women per year worldwide by 2030, nearly 90% of them in Sub-Saharan Africa (16).

A retrospective study done in Sudan on 372 patients diagnosed with Gynecologic Malignancy (GM), showed that Cervical malignancy was the commonest gynecological malignancy (49.2%), followed by ovarian malignancies (22.2%), endometrial malignancies were the third common type (19%), followed by vulvar malignancies (4.5%), then vaginal malignancy (3.5%), followed by choriocarcinoma (0.5%) and last came fallopian tube carcinoma (0.3%) and of the cervical cancers, SCC (NOS) was the most common subtype (76.6%). Adenocarcinoma was the second most common subtype (12.6%) (17).

A 10-year retrospective study done on 306 cervical cancer cases in Nigeria, showed Patient's ages diagnosed with cervical cancer to be ranged from 18 to 85 years with peak occurrence in the fifth decade. SCC was by far the most common histologic type (88.9%), While Adenocarcinomas accounted for 4.3% and leiomyosarcoma accounted for only 0.03% of cases (1 case) (18).

A 2 years retrospective study done on 1047 specimens at Lagos, in Nigeria, showed the age range of patients in 19–87 years with a mean age of 49 ± 13.0 years. The benign tumors accounted for 58.8% of the cases, with a benign to malignant ratio of 1.5:1. Of the total cervical biopsies, SCC, endocervical polyps, and cervical intraepithelial neoplasm accounted for 36.1%, 30.9%, and 15.1% respectively. The benign tumors were statistically related to the younger age groups ($P = 0.00$), however, malignant tumors showed no relationship with age group (19).

Another six-year retrospective study done on 123 Cervical cancer cases at Calabar teaching Hospital in Nigeria showed the age range of the subjects in the range of 31 to 75years. The median age of the subjects is 48.59 ± 10.61 , from which 97.56% had SCC while 2.44% were diagnosed with adenocarcinoma of the cervix. In all, 64.2% of the cases were diagnosed with non-keratinizing squamous cell carcinoma, 30.1% were diagnosed with keratinizing squamous cell carcinoma, 3.3% were diagnosed with basaloid Squamous cell carcinoma and 2.44% were diagnosed with adenocarcinoma of the cervix (20).

A 10 years descriptive retrospective study done on 2078 cases in four regions (Center, Littoral, West and South-west) of Cameroon showed that cervical cancer was the main genital cancer affecting women with a percentage of 82.26%. The age of patients ranged from 22 to 93 years with the average age of the patients being 52.33 ± 12.80 years old. More than half (52.65%) of cases occurred in the age group from 40 to 59years. The major histological types recorded were SCC with 1687 cases (81.51%) and adenocarcinoma with 269 cases (12.95%) (21).

According to a retrospective study done in Malawi, East Africa on 212 cases, cervical lesions comprised 17% (35/212) pre-cancerous lesions, 65% (137/212) cancerous and 18% (39/212) had both pre-cancerous and cervical cancer, making a total of 176 (83%) cancer lesions. The most common cervical lesion was squamous cell carcinoma (SCC) with 72 % (151/212) cases (22).

2.3. Cervical Pathologies in Ethiopia

According to a retrospective study done at Saint Paul Hospital Millennium Medical college/SPHMMC/, Addis Ababa, Ethiopia on Breast and Gynecologic Malignancies from the 2,002 malignancies, cervical cancer was the most frequent cancer (46.7%) followed by breast (29.3%) and ovarian cancers (13%). The majority of cervical cancer was predominantly observed among older women. An overall increment in number of breast and gynecologic cancer was observed over the five years period. SCC of the cervix was the most common type of cervical malignancy detected accounting for 90. % of all cases, while adenocarcinoma (3.85%) was the second most observed type of cervical cancer (23).

On a study done on primary data on 8539 patients from Addis Ababa population-based cancer registry and supplemented by 1,648 cancer cases data on six regions, in 2015 estimated 21,563 and 42,722 incident cancer cases were diagnosed in males and females, respectively. This makes a male-to-female ratio of approximately 1:2. Cervical cancer was the second most common and prevalent cancer making 23% of cancer cases preceded by Breast cancer (33%) (24).

Study done at TASH, Addis Ababa, Ethiopia showed that 72.8% of cancer patients are females. From all patients only 10% of patients did come to the center in early stage I and II. According to this study, the most common malignancy in female was gynecological malignancy 47% followed by breast carcinoma 26%. Cancer of uterine cervix found to be the most common malignancies among all gynecological malignancies (25).

A Five-Year Analysis of Histopathological Results of 40,872 biopsies Cervical Biopsies from 2003-2007 done at TASH, Addis Ababa, Ethiopia showed that the most common biopsy finding was cervical neoplasia (64%), of which 94% were SCC, while the remaining were adenocarcinoma (4%) and adenosquamous (1.1%) carcinoma. Cervical intraepithelial neoplasia (CIN) was found in 8.6% of the biopsies. The mean age of cervical cancers at diagnosis was 48years. Chronic cervicitis was the commonest benign lesion (16.8%) (26).

Another study done at TASH, A.A, Ethiopia on Women with histologically verified cancer of the cervix uteri (ICD-O-3) codes C53.0–9) showed that the Mean age was 49 years (21–91 years). The majority of patients presented with FIGO stage IIB–IIIA (46.7%). Because of progression during the waiting time (median 3.8 months), this proportion declined to 19.3% at the beginning of radiotherapy. The 1- year overall survival Probabilities was 90.4% and 2-year overall survival Probabilities was 73.6%. If assuming a worst-case scenario (i.e., if all patients not available for follow-up after 6 months had died), the 2-year survival probability would be 45.4% (27).

Another study done at A.A, Ethiopia on women with postmenopausal bleeding showed that the causes of PMB in decreasing order of frequency were: - cervical carcinoma (51.6%), endometrial hyperplasia (7.2%), endometrial or cervical polyp (7%), cervicitis (6.9%), endometrial carcinoma (6.5%), endometrial atrophy (4.4%), no organic cause (4.0%), cervical dysplasia (3.2%). In this study underlying cervical malignancy was found in nearly one of every two patients with postmenopausal bleeding. Benign cervical lesions and normal findings were found in 29.4% and 6.1% of the biopsies, respectively. The benign lesions included chronic cervicitis (16.8%) cervical polyp (6.5%), and other lesions such as cervical tuberculosis, condyloma, Nabothian cyst, Metaplasia and koilocytosis (6.1%). about 94% of the cervical malignancies were squamous cell carcinoma. There were 6 cases (0.1%) with embryonal rhabdomyosarcomas (28).

A study done in Hawassa, southern Ethiopia on 513 patients showed that the age ranges of the patients were from 17 to 85 years with mean and standard deviation of 42 ± 11 years. Nearly half (49.3%) Of these symptomatic examined cases were cancerous lesion while non-cancerous and precancerous cases account for 166 (32.4%) and 51 (9.9%) respectively. Cervical SCC was the predominant type of cancer which accounts 211(83.4%) of all cancerous cervical cases. The age group older than 60 had higher proportion of cervical cancer. The magnitude of cervical cancer and precancerous cases were steadily increasing throughout the study periods whereas non-cancerous cases were fluctuating (29).

A study done at Arbaminch University southern Ethiopia showed that Having primary educational status and secondary educational status, having history of smoking, having two or more life time sexual partners and having age at first sexual intercourse less than eighteen years were significantly associated with precervical cancer (30).

A study done in Yirgalem, southern Ethiopia showed that those with multiple sexual partners had 40 times higher odd of cervical cancer than those with no multiple sexual partners. Being Human immune deficiency virus positive (AOR=9.033), STI history (AOR=8.364) and early age at initiation of sexual intercourse (AOR=8.968) are statistically significantly associated with cervical cancer in multivariate analysis (31).

A 2year retrospective study done on 3231 samples (1263 biopsies and 1968 FNAC) at UOG: North-West Ethiopia, showed that 540 (16.7%) were malignant cancer cases. Lymphomas, cervical cancer and breast cancer are the three top common cancers of all age groups. The commonest cancer type in the Hospital were cervical cancer & breast cancer; cervical cancer ranked number one (32).

Unmatched case control study done at JUSH, showed that the mean ages of cases and controls were 47.7 and 35.5 years respectively. Older women (40-59 years), more than one husband as well as more than one wife in lifetime, women who had more than 4 children, and age greater than 25 years at first full term delivery were statistically significant and the latter two were independently associated with invasive cervical cancer. About 7(11.7 %) of cases and 58(48.3%) of controls ever heard of cervical cancers; however, 2(3.3%) of cases and 7(5.8%) of controls had ever had history of Papanicolaou (pap) smear tests done (33).

According to another study done at JUSH on 154 participants with a histopathology diagnosis of cervical cancer, 95.36% had not heard of cervical cancer and 89.6% were locally advanced at the time of diagnosis. Approximately 91% of the cervical cancer cases were SCC, 5.84% were small cell carcinomas, 2.59% were adenocarcinomas, and 0.64% were adenosquamous carcinomas (34).

2.4. Conceptual framework

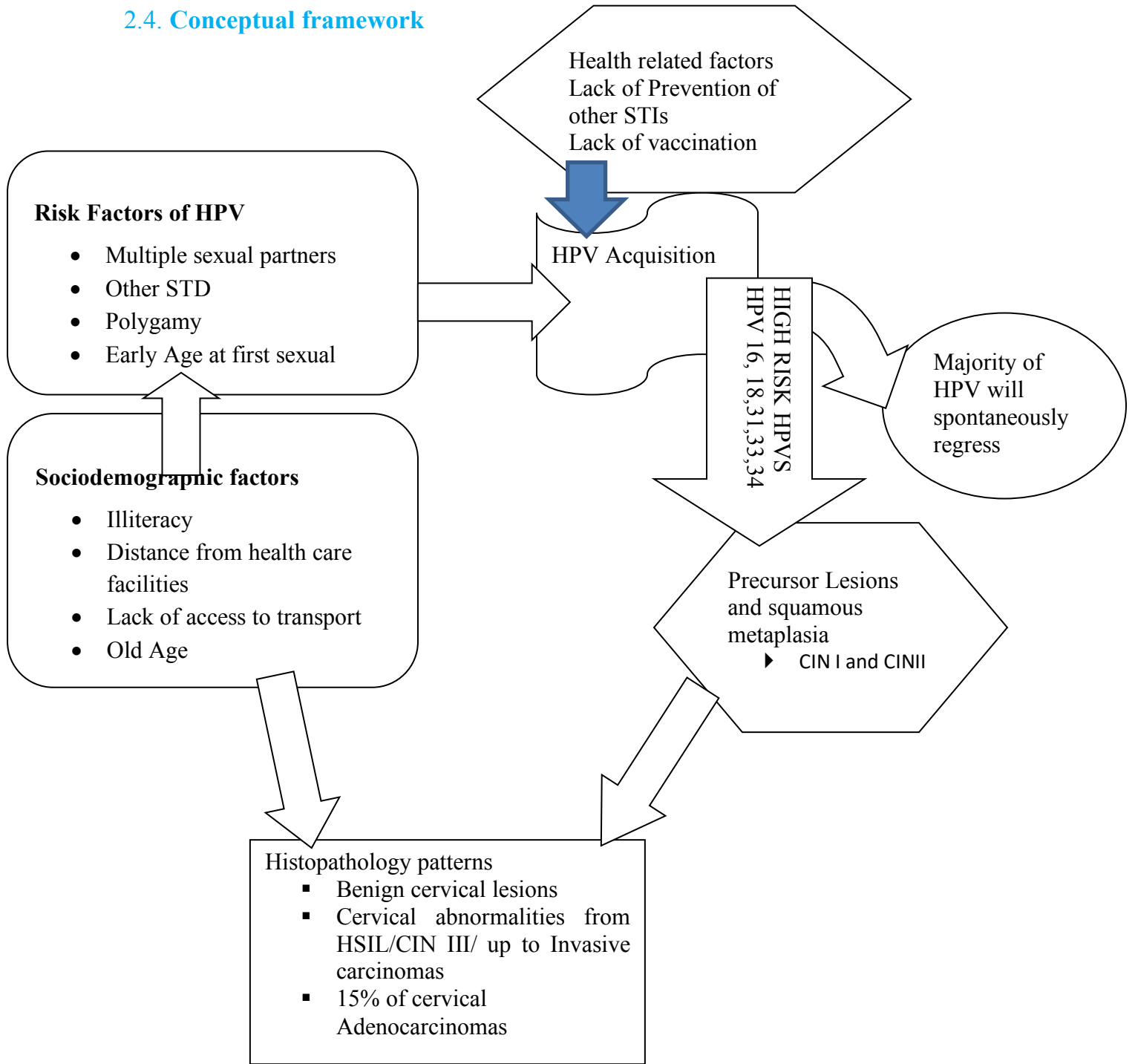


Figure 1: Conceptual framework of Cervical Pathologies JUMC, Jimma, Oromia, Ethiopia, July 2020. (1) (2) (5)

3. Objectives

3.1. General Objective

To determine histopathologic Patterns of patients with cervical lesions and associated factors at Jimma University Medical Center

3.2. Specific objectives

- ❖ To describe histopathological patterns of Cervical lesions at JUMC
- ❖ To determine clinical features of cervical lesions at JUMC
- ❖ To identify factors associated with cervical lesions at JUMC

4. Methods

4.1. Study area

The study was conducted at Jimma university medical center, formerly called Jimma University Specialized Hospital/JUSH/. JUMC was established in 1938 in Jimma town, located 352 km Southwest of Addis Ababa, the capital of Ethiopia. Jimma is the main town in Southwestern Ethiopia with an estimated population of 120,960 having a latitude of 7°41'6"North and longitude of 36°49'53"East with an elevation of 1738meters (5702 feet).Currently the hospital is a teaching and referral hospital in the southwestern part of the country, providing service for approximately 15,000 inpatient, 160,000 outpatient attendants,11,000 emergency cases and 4500 deliveries in a year coming from the catchment population of about 15 million (35) (36) (37).

Pathology department is one of the main departments in JUMC, giving services like histopathology diagnostic service, FNAC, fluid cytology and hematopathology with annual average flow of 1,928 histopathology Biopsy samples and approximately more than 5,000 FNAC and more than 200 BMA coming from the catchment population of about 15 million. At the time of this study, the department has five pathologists, 14 pathology residents, one general junior medical practitioner, two histopathology technicians, 7 assistant technicians and 4 cleaners.



Location: Ethiopia, East Africa, Africa

Latitude: 7.685° or 7° 41' 6" north

Longitude: 36.8314° or 36° 49' 53" east

Elevation: 1738 meters (5702 foot)

GeoNames ID: 10376723

Figure 2:Map showing the study area, JU, Jimma, Jimma zone, Oromia, Ethiopia (37) (38).

4.2. Study design and period

A 2 years' retrospective cross-sectional study design was conducted from 1st May to 30th June, 2019.

4.3. Population

4.3.1. Target population

All female patients in the catchment area of Jimma university medical center

4.3.2. Source population

All female patients who submitted biopsy specimen to pathology department for histopathology diagnosis from 12th September 2018 to 11th September 2019

4.3.3. Study population

Histopathology reports of all female patients who submitted cervical tissue specimen to pathology department from 12th September 2018 to 11th September 2019

4.3.4. Study Unit

Histopathology reports of selected female patients who submitted cervical tissue specimen to pathology department from 12th September 2018 to 11th September 2019 fulfilling inclusion criteria.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion Criteria

All female patients who submitted cervical tissue specimen to pathology department from 12th September 2018 to 11th September 2019

4.4.2. Exclusion Criteria

Biopsy reports without:

- Histopathologic diagnosis
- Repeated Biopsy
- Two or more independent variables

4.5. Sample size and Sampling technique

Histopathology hard copy reports of 543 patients at JUMC, pathology department from 12th September 2018 to 11th September 2019 were retrieved from pathology department data archive and those reports that fulfilled the inclusion criteria were manually selected and then grouped by year after being retrieved from the entire hard copies of 3766 histopathology reports from the Department of Pathology archives. From the 543 reports, 74 cases were excluded of which 44 were Inconclusive for diagnosis and 30 cases were repeated biopsies. Relevant information was collected by checklist from 469 hard copies.

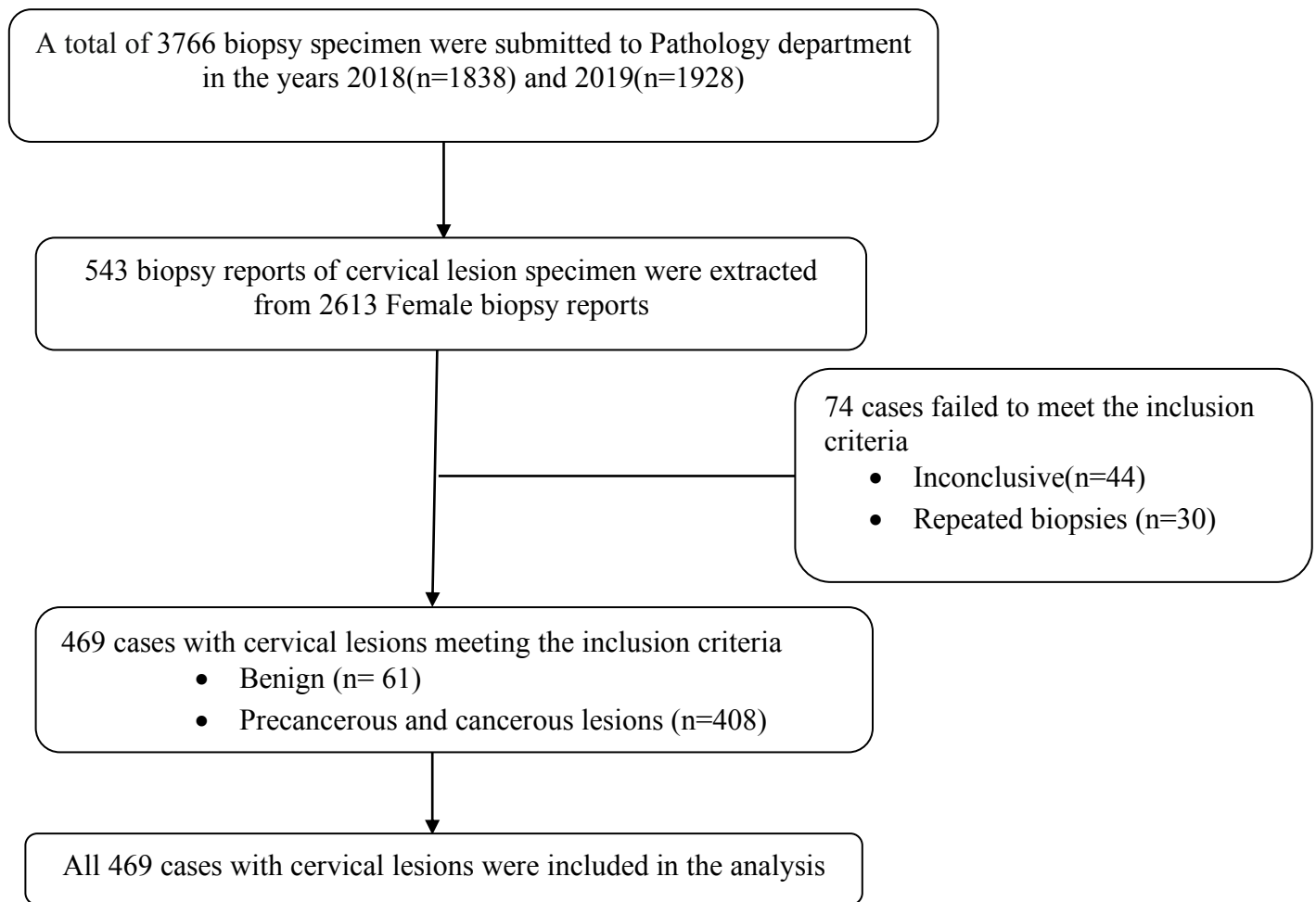


Figure 3 : Diagram showing sampling procedure of the selected 469 cervical lesion biopsy records from the year 2018 to 2019, JUMC

4.6. Study variables

4.6.1. Dependent variable

- ❖ Histopathologic pattern of Cervical tissue specimens

4.6.2. Independent variable

- ♠ Age
- ♠ Place of Residence
- ♠ Type of biopsy
- ♠ Clinical features

4.7. Data collection procedures

Histopathology reports of Biopsies submitted from cervical lesions which were routinely processed and from which paraffin sections were taken and stained with Haematoxylin and Eosin (H&E) for microscopic examination and histopathological diagnosis at JUMC, pathology department from 12th September 2018 to 11th September 2019 were retrieved from pathology department data archive. Eligible 469 Reports fulfilling inclusion and exclusion criteria were extracted and recorded into a prepared checklist containing study variables. All necessary preventive methods for Corona virus disease-19(COVID-19) were held throughout as per the national protocol by using personal protective equipment, physical distancing and disinfectants.

4.8. Data Processing and Analysis

Data was cleaned, coded and entered into Epidata v3.1 and exported to SPSS version 26 for analysis. Descriptive and analytic statistics were done, categorization of qualitative variables and proportions were calculated. Cross tabulation, chi square test and logistic regression with multivariate analysis were done to look for associations between the study variables. Those variables with a P -value <0.25 in a binary logistic regression were recruited for multivariable logistic regressions. A p -value <0.05 was used as a cut-off point for identifying predictors for histopathologic patterns. The findings were presented using text, tables and charts.

4.9. Data quality management

Checklist was adopted after reviewing different literatures and books and checklist was pretested on 47 cases (10% of total sample size) of biopsy hard copy reports done in the year 2017 which were not included in the current study.

Then the checklist was revised with some modification of the variable and the final revised checklist was used for data collection. Two days of training was given to the data collectors on how to locate, retrieve, categorize and record the data and initial data collection was accompanied by the principal investigator. The principal investigator subsequently followed and supervised while the data collectors were retrieving and recording the biopsy results from pathology department data archive using check lists. After checklist was checked for completeness, data was entered into Epi data on password protected computer and exported to SPSS version 26 for analysis.

4.10. Ethical consideration

Before Data collection the proposal of this study was submitted to Jimma university research and ethical committee. Then, ethical clearance was obtained from the Institutional Review Board (IRB) of JUMC and was submitted to the responsible authorities of JUMC and Department of Pathology before proceeding to data collection. All the information collected from the study was handled confidentially by omitting their personal identification.

4.11. Operational Definitions

Cervical tissue specimens: - specimens of patients with cervical complaints like punch Biopsies and hysterectomy specimens.

Cancerous cervical lesion: - malignant lesions of cervix from carcinoma insitu and above.

Histopathologic pattern: specific type of diagnosis made on biopsy specimens.

Non-cancerous cervical lesion: - benign conditions of the cervix.

Precancerous cervical lesion: - precursor lesions of cervical Cancer from CINI-CINIII.

4.12. Limitation of the study

Biopsy Results are not computerized and compiled with patient data, thus most of the associated factors with cervical cancer cannot be assessed. Confirmatory Immunohistochemistry and HPV DNA testing cannot be included in this study.

4.13. Dissemination plan

The results of this study will be communicated to Jimma University, and will be disseminated to the Regional Health Bureau and EFMOH. Publication on an appropriate journal will also be done.

5. Results

A total of 3766(2613 Female and 1153 male) biopsy specimen were submitted to Pathology department in the years 2018(n=1838) and 2019(n=1928). From 2613 Female biopsy reports, 543 biopsy reports of cervical lesion specimen were extracted from which 74 were excluded because they fulfill exclusion criteria's. Cervical biopsy specimens accounted for 14.4% of the total biopsy specimens and it accounts for 20.8% of total biopsy specimens from female patients who submitted biopsy specimen during the study period.

5.1. Sociodemographic profiles

From 469 cervical lesion cases, 244 cases (52%) were from 2018/19 and 225(48%) cases were from 2019/20(Figure 4).

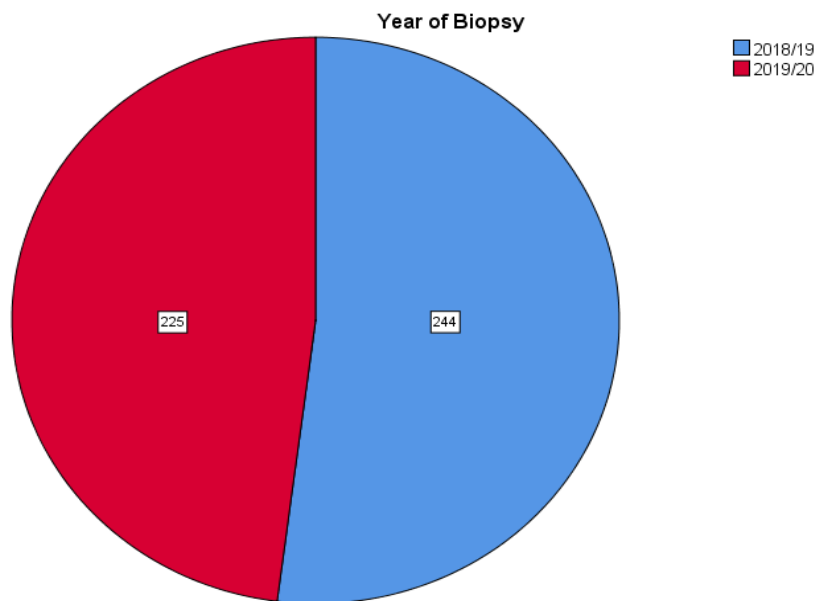


Figure 4: Pie Chart showing distribution of cervical lesions between the years 2018 and 2019, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

The age distributions have minimum value of 22 years and maximum value of 85 years with mean age of 47.06 years and the standard deviation was 11.019 years. The Maximum age distribution of cervical lesions was in 41-50 years age range accounting for 154 (32.8%) biopsies followed by 31-40 years with 143 (30.5%) biopsies and 51-60 years with 102(21.7%) biopsies. More than half of precancerous and cancerous cervical lesions (65.46%) occurred after the age of 40 years while benign lesions accounted for 47.5% after the age of 40 years. This was statistically significant ($X^2=23.54$, $DF =5$ $p=0.001$).

As age of patient increases risk of having precancerous and cancerous cervical lesions increased and third and fourth decade of life was found to associate with the increased risk of having precancerous and cancerous cervical lesions (Figure 5).

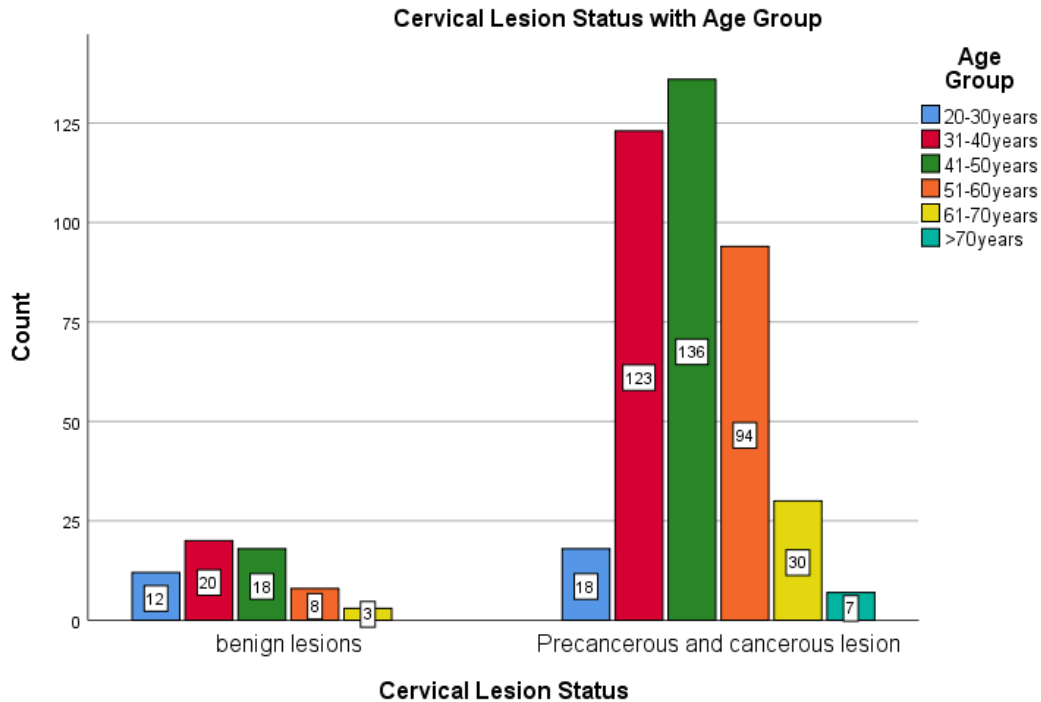


Figure 5 : Bar graph Showing cervical lesion status with age groups, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

Most of the patients (77.8%) were from surrounding areas with variable distance from Jimma town, while 104(22.2%) of patients were from Jimma town. Majority of patients coming from the periphery are from Jimma zone accounting for 58.4% (Figure 6) .Most of (88.8%) of cases from the surrounding areas of Jimma are Precancerous and cancerous cervical lesions while 80.8% of Jimma town cases were Precancerous and cancerous cervical lesions. This showed strong association between Precancerous and cancerous cervical lesions and residency which was statistically significant in that patients coming from surrounding areas of Jimma have a higher chance of having precancerous and cancerous cervical lesions as compared to those from Jimma town. ($X^2=4.67$, $DF = 1$ $p= 0.027$) (Figure 6).

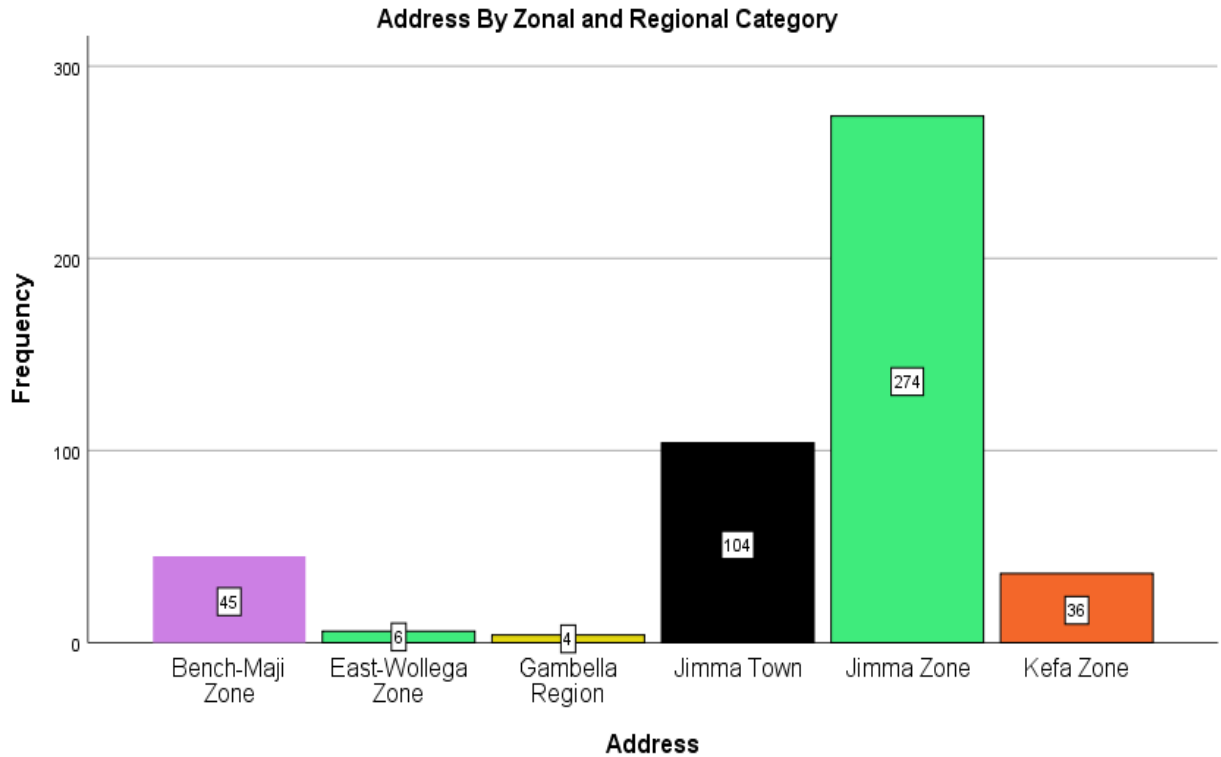


Figure 6 : Bar Graph showing distribution of cervical Lesions among Residents of Jimma town and surrounding areas, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

5.2. Clinical data of patients with Cervical Lesions

The most common presenting symptom of patients with cervical lesions was vaginal bleeding alone accounting for 206(43.9%) followed by vaginal bleeding with vaginal discharge (108(23%)) and vaginal bleeding with lower abdominal pain (89(19%)) (Table 1). The duration of symptoms of patients with cervical lesions ranged from 4days up to 16years with 152 (32.4%) patients presented with 7months-2years of onset of symptoms followed by 1-3months (139(29.6%)) and 4-6months (102(21.7%)) (Figure 7).

The most common type of Biopsy performed for patients with cervical lesions was Punch Biopsy accounting for 72.9% followed by Non-specific cervical biopsy (46(9.8%)) and Hysterectomy (30(6.4%)) (Table 2). Most (90%) of patients with cervical complaints were clinically diagnosed with cervical cancer followed by cervical polyp (18(3.8%)) and HSIL (14(3%)) (Figure 8).

Table 1: Clinical features/presentation of Patients with cervical lesions, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

Clinical features/presentation	Frequency	Percent
Vaginal Bleeding	206	43.9
Vaginal Bleeding and Vaginal Discharge	108	23.0
Vaginal Bleeding and Lower abdominal pain	89	19.0
Vaginal Discharge	44	9.4
Mass Per Vagina	20	4.3
Cervical CA Screening	2	0.4
Total	469	100.0

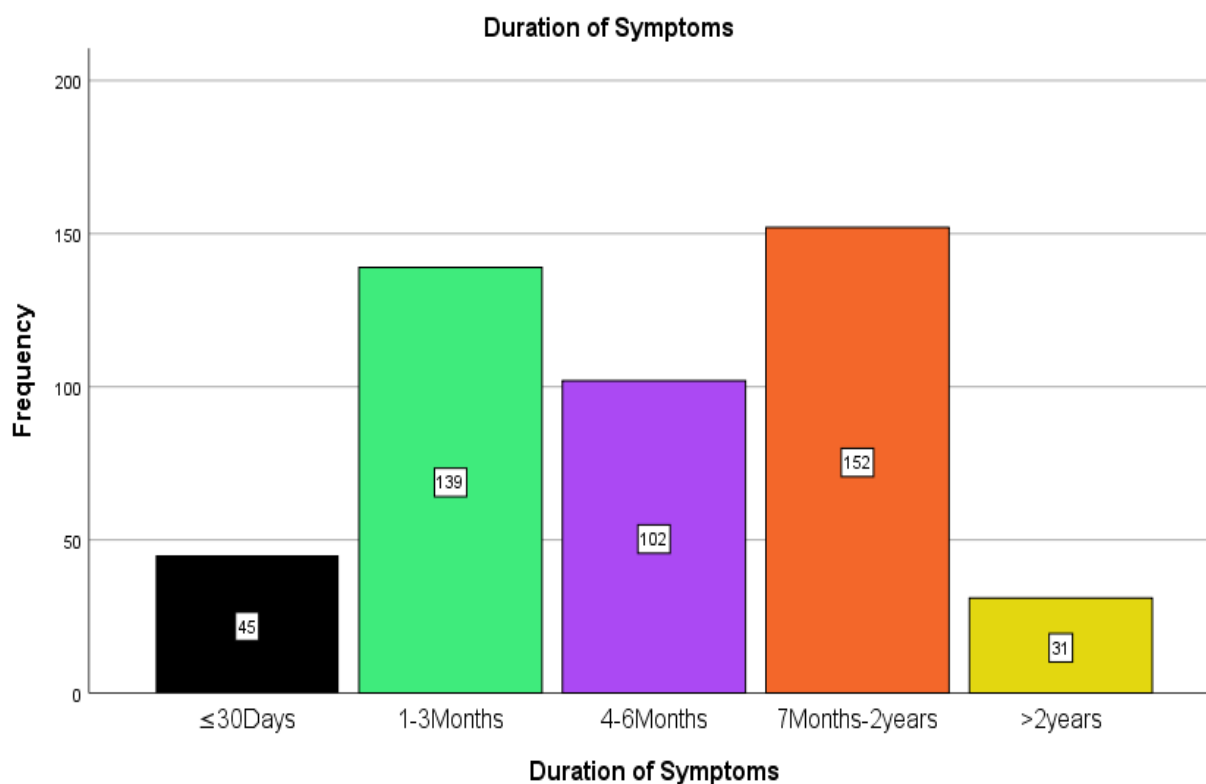


Figure 7: Bar Graph showing distribution of Duration of symptoms of patients with cervical Lesions, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

Table 2: Type of Biopsy of Patients with cervical lesions, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

Type of Biopsy/Nature of specimen	Frequency	Percent
Non-specific cervical Biopsy	46	9.8
Cervical Tissue	23	4.9
Cone Biopsy	3	0.6
Endometrial Biopsy	3	0.6
Excisional Biopsy	14	3.0
Hysterectomy	30	6.4
LEEP	8	1.7
Punch Biopsy	342	72.9
Total	469	100.0

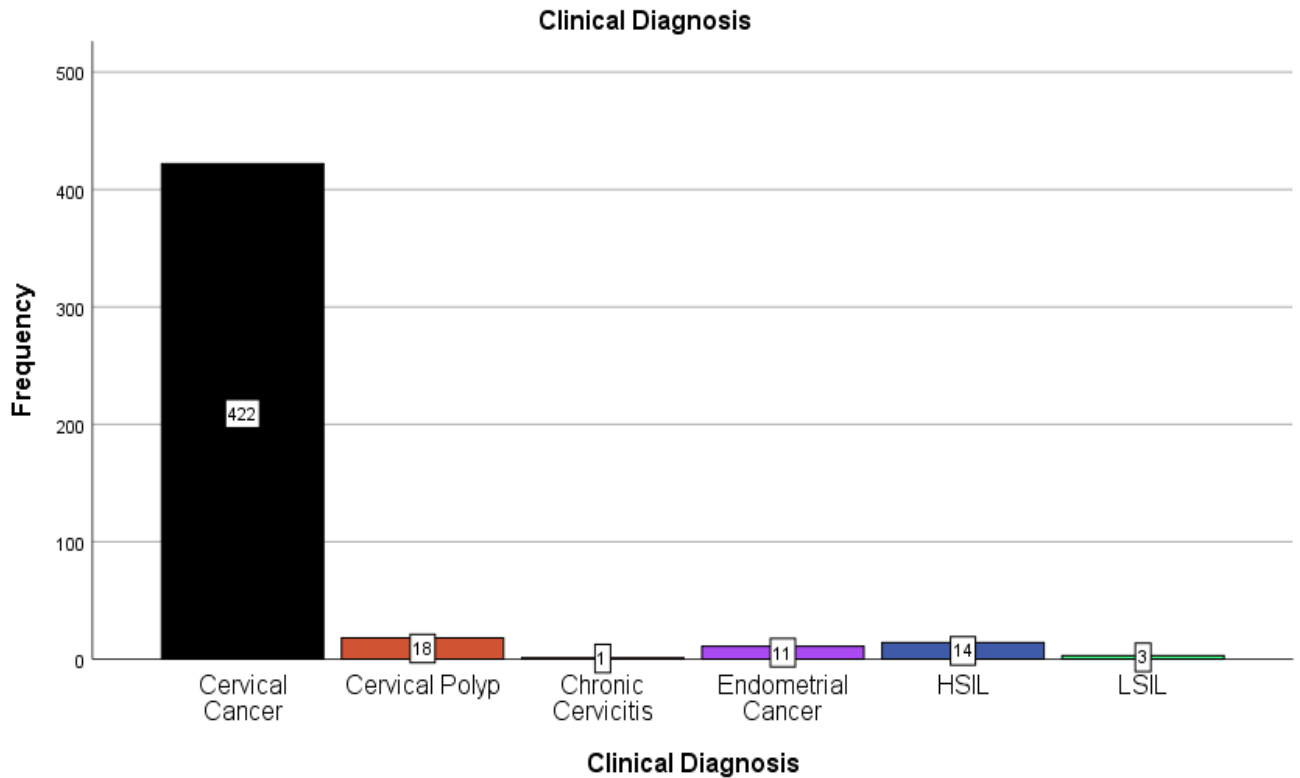


Figure 8: Bar Graph showing distribution of Clinical Diagnosis of patients with cervical Lesions 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

5.3. Histopathologic patterns of cervical lesions

Most (87%) of the specimens were Precancerous and cancerous cervical lesion while 13% were benign cervical lesions (Figure 9). Majority (71%) of cases were cancerous cervical lesions followed by Precancerous cervical lesion (16.4%) (Table 3).

Table 3: Numbers and percentages of cervical lesion, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

Type of Cervical Lesion	Frequency	Causes	Percentage
Precancerous cervical lesion	77	52(67.5%)HSIL 25(32.5%)LSIL	16.4%
Cancerous cervical lesion	333	See Table 4	71%
Non-cancerous cervical lesion	59	35(59.3%)Endocervical polyp 18(30.5%)Squamous metaplasia 6(10.2%)Cervicitis	12.6%
Total	469		100%

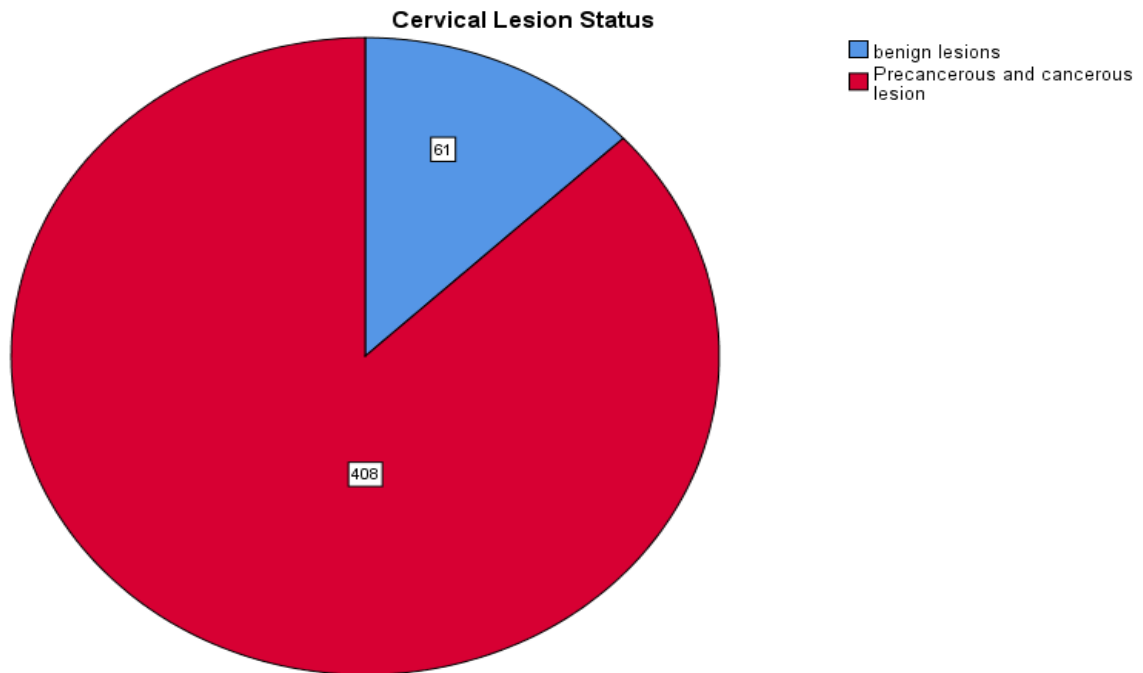


Figure 9: Pie Chart showing distribution of cervical lesion status, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=469

Squamous cell carcinoma (SCC) was the most frequent cervical cancer diagnosed during the study period accounting for 95.8% followed by adenocarcinoma (3.3%) and carcinoma insitu (0.6%) (Table 4). HSIL was the most frequently diagnosed precancerous lesion accounting for 67.5%, the other 32.5% being LSIL. Endocervical polyp was the most commonly diagnosed benign lesion accounting for 59.3% followed by squamous metaplasia (30.5%) and cervicitis (10.2%) (Tables 3). The most common histologic subtype of SCC is keratinizing SCC accounting for 77.4% while the remaining the remaining 22.6% were non-keratinizing SCC (Figure 10).

Table 4: Histopathological classification of cervical cancer, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=333

Histopathologic type	Frequency	Percentage
Squamous cell carcinoma	319	95.8%
Adenocarcinoma	11	3.3%
Adenosquamous carcinoma	1	0.3%
Carcinoma insitu	2	0.6%
Total	333	100%

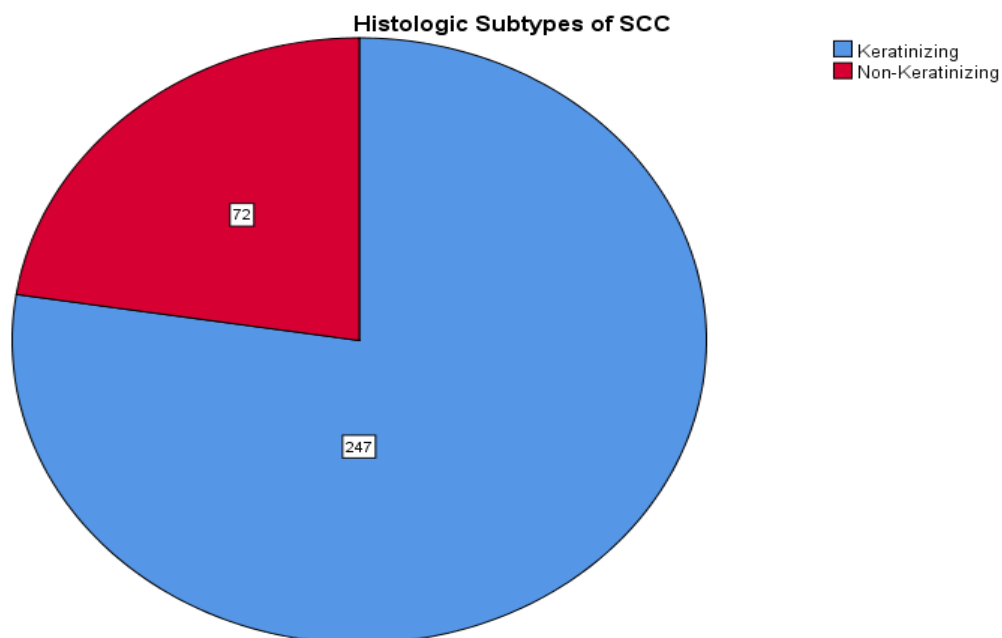


Figure 10: Pie Chart showing Histologic types of SCC 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020, N=319

Cancerous cervical lesions tend to develop in the older age groups and benign conditions in the younger age groups. SCC occurred most frequently in the age group 41-50 years (N=104), followed by age group 31-40years (N=86) and age group 51-60years (N=85) (Table 5)

Table 5: Pattern of cervical lesion by age group,2018-2019, JUMC, Jimma, Oromia, Ethiopia, July 2020

Age Group	Histopathologic Diagnosis									Total
	Cervicitis	Squamous Metaplasia	Endocervical Polyp	LSI	HSIL	Carcinoma Insitu	Squamous Cell Carcinoma	Adenocarcinoma	Adenosquamous Carcinoma	
20-30years	0	4	8	3	1	0	14	0	0	30
31-40years	2	6	13	11	22	1	86	1	1	143
41-50years	3	3	10	10	19	0	104	5	0	154
51-60years	0	3	4	1	6	0	85	3	0	102
>60years	1	2	0	0	4	1	30	2	0	40
Total	6	18	35	25	52	2	319	11	1	469

Age ($p=0.001$) and place of residence ($p= 0.027$) were tested at P-value less than 0.05 for their association and selected as candidate variables for binary logistic regression. Binary logistic regression analysis was performed in backward method with likelihood ratio through two steps and three blocks on these variables and age ($p=0.001$) and place of residency ($p=0.014$) showed to be the independent predictors of precancerous and cancerous cervical lesions which was statistically significant as shown on Table 6.

Table 6: Binary logistic regression of cervical lesion status and associated factors, 2018–19, JUMC, Jimma, Oromia, Ethiopia, July 2020

		P-value	df	AOR	95% C.I.for AOR	
					Lower	Upper
Step 1 ^a	Age	.001*	1	1.048	1.019	1.078
	Constant	.731	1	.805		
Step 2 ^b	Age	.001*	1	1.052	1.022	1.082
	Place of residence	.014*	1	2.133	1.168	3.894
	Constant	.054	1	.183		

* Significant P-values.

6. Discussion

Cervical lesions tend to affect females in a wide age range. From 469 Biopsies submitted to JUMC, department of pathology, the age distributions have minimum value of 22 years and maximum value of 85 years with mean age of 47.06 years and the standard deviation was 11.019 years. The Maximum age distribution of cervical lesions was in fifth decades (41-50 years) accounting for 154 (32.8%) biopsies. This is consistent with study done in Hawasa, Ethiopia by Ameya G., on 513 Biopsies, in which the age ranges of the patients were from 17 to 85 years with mean and standard deviation of 42 ± 11 years. About 39% of women with histopathologic sample were age group between 31 and 40 years old (29). In another study done on 1047 specimens in India, showed the age range of patients in 19–87 years with a mean age of 49 ± 13.0 years (13). Another study done on 591 women in Jordan, showed the age at diagnosis ranged between 15 and 97 years, with a median of 50 years (12). Our findings are consistent with this and other similar studies.

Patients with cervical lesions present with variety of different symptoms. The most common presenting symptom of patients with cervical lesions in this study was vaginal bleeding alone accounting for 206(43.9%) followed by vaginal bleeding with vaginal discharge (108(23%)) and vaginal bleeding with lower abdominal pain (89(19%)). This is consistent with a study done in Addis Ababa, on 40,872 biopsies which showed that the commonest presenting complaint was vaginal bleeding (n=2,978, 75%) followed by vaginal discharge (539, 13.6%) pain (n=294, 7.4%) (26). A study done on 75 cases in Nigeria, showed that the common clinical features were postmenopausal bleeding (84.0%), vaginal discharge (72.0%) contact bleeding (64.0%), and abdominal pain (56.0%) (6). which are similar with this study.

The most common type of Biopsy performed for patients with cervical lesions on 469 biopsies submitted to JUMC, department of pathology during the study period was Punch Biopsy accounting for 72.9% followed by Non-specific cervical biopsy (46(9.8%)) and Hysterectomy (30(6.4%)) This is consistent with study done in Hawasa, Ethiopia by Ameya G on 513 Biopsies, which showed majority of samples 391 (76.2%) taken in study period to be punch biopsy (29). In another study done in India on 107 cervical specimens, 74.7% were cervical biopsy specimens, 25.2% were hysterectomy specimens (13). In our study nonspecific cervical biopsies higher than

hysterectomies because postsurgical radiotherapies were not initiated at the center during the study period, most patients with advanced stage cervical cancer were referred to Addis Ababa after receiving the punch biopsy result for subsequent therapies, hence lower number of hysterectomies.

From 469 biopsy reports of patients with cervical complaints, most (90%) were clinically diagnosed with cervical cancer followed by cervical polyp (18(3.8%)) and HSIL (14(3%). This is consistent with study done in Addis Ababa, on 40,872 biopsies in which the commonest indication for the punch biopsies was the clinical suspicion of cervical cancer (91.4%) (26).

Cervical lesions causes ranged from benign inflammatory conditions and polyps to malignant conditions. From 469 Biopsies submitted to JUMC, department of pathology most (87%) of the specimens were Precancerous and cancerous cervical lesion while 13% were benign cervical lesions. Majority (71%) of cases were cancerous cervical lesions followed by Precancerous cervical lesion (16.4%) and Non-cancerous cervical lesion (12.6%). This is consistent with study done in Hawasa, Ethiopia by Ameya G on 513 Biopsies, showed that 49.3% of symptomatic women were diagnosed for cervical cancer. Precancerous and non-cancerous cervical cases account 9.9% and 32.4% respectively (29). Another study done in Addis Ababa, on 40,872 biopsies showed that Invasive cervical malignancy was the most common histological finding (n=2318,55.7%) while cervical intraepithelial neoplasia (CIN) accounted for 8.6% (n=358) of the cervical biopsies. Benign cervical lesions and normal findings were found in 29.4% (n=1224) and 6.1% (n=255) of the biopsies, respectively (26). Another study done in Malawi, East Africa on 212 cervical lesions showed that 17% had pre-cancerous lesions, 65% cancerous and 18% had both pre-cancerous and cervical cancer, making a total of 83% cancer lesions (22). Another study done in India on 110 cases showed that diagnosis of intraepithelial neoplasia was made in 32.7% cases and invasive carcinoma was found in 67.3% cases (14). So the finding of our study has slightly higher number of cancerous cases from these last three finding and other similar studies. This is possibly because of the limited resource and services within the study area.

Squamous cell carcinoma (SCC) was the most frequent cervical cancer diagnosed during the study period accounting for 95.8% of 333 cancerous cases followed by adenocarcinoma (3.3%) and carcinoma insitu (0.6%). This is consistent with study done at JUSH, Jimma, Ethiopia on

154 cervical cancer cases showed that 91% of the cervical cancer cases were SCC, 5.84% were small cell carcinomas, 2.59% were adenocarcinomas, and 0.64% were adenosquamous carcinomas (34). Another study done in Addis Ababa, on Breast and gynecologic malignancies at SPHMMC which showed that Squamous cell carcinoma of the cervix was the most common type of cervical malignancy detected accounting for 90% of all cases, while adenocarcinoma (3.85%) was the second most observed type of cervical cancer (23). Similarly, a study done in Hawasa, Ethiopia by Ameya G on 513 Biopsies, showed that squamous cell carcinoma (SCC) also accounts about 211 (83.4%) of total cervical carcinoma is followed by adenocarcinoma which accounts 39 (15.4%) and the others are adenosquamous carcinomas, and mucinous adenocarcinoma (29). Another study done in Sudan on 411 Gynecologic Malignancy cases showed that, from 184 cases of cervical cancer, Squamous cell carcinoma (NOS) was the most common subtype (76.6%). Adenocarcinoma was the second most common subtype (12.6%) (17). Our study is also consistent with a study done in Cameroon, on 2078 cervical cancer cases which showed that the most common cervical cancer was SCC(81.18%) followed by adenocarcinoma(12.95%) (21). According to a study done in India over a period of 2 years the most frequent condition diagnosed on cervical biopsies and hysterectomy specimens were benign cervical polyp (66.3%), followed by carcinoma (23.7%) and squamous intraepithelial lesion (0.2%) (13). This last study and other studies done in western countries show higher number of benign cervical lesions because of the early screening and detection of precursor lesions.

From 77 precancerous cervical conditions diagnosed during the study period, HSIL was the most frequently diagnosed precancerous lesion accounting for 67.5%, the other 32.5% being LSIL. This is consistent with study done in Hawasa, Ethiopia by Ameya G on 513 Biopsies, showed that among precancerous cervical lesion, HSIL was the predominant one. (39.8%) (29). Similarly, a study done in India which showed that Cervical Intraepithelial Neoplasia (CIN) 1 was diagnosed in 36.1% patients, followed by CIN 2 (33.3%) and CIN 3 (30.6%) (14). In another study done on 1047 specimens in India, showed that out of 11 cases of squamous intraepithelial lesion (10.2%), 5 cases were reported as low grade squamous intraepithelial lesion [LSIL] and 6 cases were reported as high grade squamous intraepithelial lesion [HSIL] (13).

From 59 benign cases Endocervical polyp was the most commonly diagnosed benign lesion accounting for 59.3% followed by squamous metaplasia (30.5%) and cervicitis (10.2%). A study done in Addis Ababa on 475 cases showed that, benign lesions included chronic cervicitis (16.8%) cervical polyp (6.5%), and other lesions such as cervical tuberculosis, condyloma, Nabothian cyst, Metaplasia and koilocytosis (6.1%) (28). Another study done in Nigeria on 176 cervical specimens showed that inflammatory lesions accounted for 55 cases (59.8%) of non-neoplastic cervical lesions followed by endocervical polyps accounting for 15 cases (16.3%) of non-neoplastic cervical lesions. Among the inflammatory lesions, chronic non-specific cervicitis was the most commonly encountered lesion constituting 40 cases (72.2%) of all inflammation (39). Contrary to this and other similar study has the least number of cervicitis, this is possibly because majority of Cervicitis cases are managed clinically without histopathological confirmation once clinical diagnosis is made as per the National STD guidelines.

7. Conclusion

Cervical diseases include wide range of disorders and occur across different age groups. The age distributions have minimum value of 22 years and maximum value of 85 years with mean age of 47.06 years. The Maximum age distribution of cervical lesions was in the fifth decade. More than half of precancerous and cancerous cervical lesions (65.46%) occurred after the age of 40 years. The most common presenting symptom of patients with cervical lesions was vaginal bleeding. The most common type of biopsy performed for patients with cervical lesions Punch biopsy. Most (90%) patients with cervical complaints were clinically diagnosed with cervical cancer. Cervical lesions causes ranged from benign inflammatory conditions and polyps to malignant conditions. Most cervical lesion were Precancerous and cancerous cervical lesion. Squamous cell carcinoma (SCC) was the most frequent cervical cancer. HSIL was the most frequently diagnosed precancerous cervical lesion. Endocervical polyp was the most commonly diagnosed benign cervical lesion. Precancerous and cancerous cervical lesions tend to increase with increasing age and in those patients coming from peripheral areas.

8. Recommendation

There was raising burden of cervical cancer. This implies that there is a need to educate the community to improve the health seeking behavior and also on possible preventive strategies of cervical cancer. It is also strongly recommended that JUMC, department of pathology commences cervical cytological examinations to catch dysplasia before they turn into full blown cancers. We recommend EFMOH to strengthen the ongoing nationwide HPV vaccinations and screenings and interventions on cervical cancer at a much faster rate.

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Annexes

Annex 1: - Institutional consent

To:-JUMC, Department of Pathology

My name is Dr Birhanu Hailu, final year pathology resident at Jimma University. I am doing a research titled “Histopathologic patterns of cervical lesions at Jimma University Medical Center, Jimma, South west Ethiopia: a 2 Year Retrospective Cross-Sectional study” as a Partial fulfillment for the requirement of specialty in human anatomic pathology. The objective of the research is to determine histopathologic Patterns of patients with cervical lesions and associated factors at Jimma University Medical Center.

The research requires the use of secondary data’s of Histopathology reports of Biopsies submitted from cervical lesions at JUMC, pathology department in the years 2018 and 2019. Data collection occurs from 1st July up to 31st July.

I kindly request, department of pathology, JUMC to grant me permission for data collection of the secondary data’s of the specified period.

Annex 2: - Checklist for Data collection

Please fill in the form below from the Biopsy Reports Containing Cervical tissue specimens and/or Diagnosis

1. Year of Biopsy

A. 2018-----

B. 2019-----

2, Age Of the patients

A. <30-----

B. 31-40-----

C. 41-50-----

D. 51-60-----

E. 61-70-----

F. >70-----

3. Place of residence/Address of patients

A. Jimma Town-----

B. Woredas (Eg Limmu, Seka, Chora) -----

C.SNNPR (Eg Mizan, Bonga, Tercha) -----

4. Nature of specimen/type of biopsies

A. Punch Biopsies-----

B. Hysterectomy specimen-----

C.Cone Biopsies -----

D.Others-----

5. Clinical features/presentation

A.Abnormal vaginal bleeding-----

B. Vaginal discharge-----

C.Dyspareunia/pain during intercourse -----

D.Others-----

6. Duration of symptoms

- A. <1month -----
- B. 1-3months-----
- C.3-6months -----
- D.6months-2years-----
- E.>2years-----

7. Type of Cervical Lesions

- A. Precancerous cervical lesion (CIN I-II) -----
- B. Cancerous cervical lesion (CIN III and above) -----
- C. Non-cancerous cervical lesion (Eg, Cervicitis, Polyp) -----
- D. Others-----

8. Non-cancerous cervical lesion

- A. Polyp-----
- B. Cervicitis-----
- C. Others-----

9. Precancerous and cancerous cervical lesion

- A.LSIL-----
- B.HSIL -----
- C.Carcinoma insitu-----
- D.Invasive carcinoma-----
- E.Others-----

10. Histopathological classification of cervical cancer

- A. Squamous cell carcinoma -----
- B. Adenocarcinoma -----
- C Adenosquamous carcinoma -----
- D. Carcinoma, unspecified -----
- E. Others-----

11. Histologic type of SCC

- A. Keratinizing-----
- B. Non-keratinizing-----
- C. Others-----