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## Original Article

# Evaluation of Cervical Cytology in Patients using Colposcopy and Cervical Biopsy in Al-Zahraa Hospital

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**ABSTRACT**

**Background:** Cancer cervix accounts for 7.0% of all malignancies in developed countries and 24.0% in developing countries. Screening for the disease helps to decrease its burden, especially as the cases remain asymptomatic till the disease is established. The gold standard clue for diagnosis is histopathology, but due to the invasive nature, non-invasive screening methods are required.

**Aim:** This study aims to Evaluate the accuracy of cervical cytology and colposcopy findings in diagnosing cervical dysplasia in the clinically suspicious cervix by comparing it with the histopathological examination.

**Patients and methods:** The study included 300 females with clinically suspicious cervix. The cases were subjected to full history taking and full clinical examination. The Pap smear test and colposcopic examination were conducted and their results were compared to the pathological results to detect their diagnostic performance.

**Results:** There were 232 cases with abnormal findings by the biopsy [77.3%]. Regarding the type of abnormal findings, LSIL was the most common finding in 77.1% of the cases with abnormal findings. Papanicolaou smear revealed a sensitivity of 85.7%, specificity of 75.0%, PPV of 84.0%, NPV of 78.7%, and accuracy of 80.2% compared to biopsy results. Colposcopic findings revealed a sensitivity of 91.7%, specificity of 84.3%, PPV of 92.0%, NPV of 82.6%, and accuracy of 86.7% as compared to biopsy.

**Conclusion:** The study findings demonstrate that colposcopy is significantly more sensitive and accurate compared to pap smear. By integrating pap smear with colposcopy, we can optimize the accuracy and precision of cervical cancer screening.

**Keywords:** Cervical Cancer; Pap Smear; Colposcopy.

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## INTRODUCTION

Cervical cancer [CC] ranks as the fourth most common cancer among women globally. HPV infection is linked to most cases of cervical cancer, although a small percentage of cervical cancers show no presence of HPV [1].

Cervical cancer continues to be a significant health issue globally, especially in developing nations without established national screening or vaccination initiatives [2]. Most sexually active females will experience an HPV infection at some point in their lives, but it is typically self-limiting and cleared by the immune system [3].

Efforts to decrease the incidence of cervical cancer focus on detecting precancerous lesions early. Enhanced cervical cytology and human papillomavirus [HPV] screening techniques have led to a reduction in cervical cancer cases [4, 5]. One simple, safe, non-invasive, and highly effective method for detecting cervical abnormalities [cancerous, precancerous, and otherwise] is the Papanicolaou [Pap] smear. For women who experience inflammatory pap smear findings, it is possible to miss premalignant cervix lesions due to the high false-negative rate of pap smears [6].

Colposcopy is an internationally recognized technique for identifying cervical cancer in its early stages. It is preferred because it produces quicker findings and helps identify the best locations for biopsies, making it a superior screening approach [7,8]. Yet, in a prior meta-analysis, colposcopy's diagnostic accuracy ranged from a sensitivity of 29.0% to 100.0% and a specificity of 12.0% to 88.0% [9].

The current study was conducted to evaluate the accuracy of cervical cytology in the diagnosis of cervical dysplasia in the clinically suspicious cervix by comparing it with the colposcopy findings and histopathological examination in Al-Zahraa University Hospital.

## PATIENTS AND METHODS

This is a cross-sectional observational and descriptive study that included 300 females with suspicion of cervical cancer. The cases were recruited from the Department of Obstetrics and Gynecology, at the Hospital of Al-Zahraa Cairo, Egypt. This research followed the 2013 revisions to the Helsinki Declaration [10]. The study was only carried out when the local ethics committee at Al-Azhar University's Faculty of Medicine gave its permission.

The study comprised individuals aged 20 to 60 who presented with clinically unhealthy cervix symptoms [including erosion, post-coital bleeding, keratinization, and bleeding on touch] white discharge, intermenstrual bleeding, or simple leukoplakia. Women who were pregnant, had vaginal bleeding, had undergone a hysterectomy, or had received prior treatment for carcinoma cervix were excluded from the study.

**Data collection**: The cases were subjected to full history taking [with a concentration on the risk factors of cervical cancer] and full clinical examination [including local gynecological examination with Speculum examination of the cervix and vagina].

**Pap smear**: A pap smear test was performed while the case was in a comfortable lithotomic position, followed by the insertion of a clean dry, self-retaining Cusco's vaginal speculum. A cotton swab was used to clean the cervix, and a wooden spatula to collect a sampling of cervical cells by rotation of the spatula 360 degrees into the cervical os, and the brush was introduced into the endocervix and rotate 360 degrees to obtain endocervical smear. The sample was placed on a glass slide and fixed immediately by immersion in 95% ethanol and sent to the laboratory for cytological study. PAP-smear results were analyzed using the Bethesda classification system. ASCUS, LSIL, HSIL, and invasive carcinoma were their respective classifications.

**Colposcopic examination**: After washing the vagina and cervix with cotton swabs soaked in Normal Saline to remove the discharge, the cervix was examined under light. The cervix was topically treated with a 3% acetic acid solution using a cotton ball. The use of 3% acetic acid during Visual Inspection with Acetic Acid [VIA] resulted in the emergence of acetowhitening on the cervical epithelium, indicating a favorable outcome. Subsequently, the cervical tissue was treated with Lugol iodine to apply a stain. When iodine is administered, the normal cervical squamous epithelium typically turns mahogany dark or black. However, cervical neoplastic cells have a thicker saffron or mustard-yellow color on VILI.

**Pathology:** A cervical punch biopsy was performed on all patients who had suspected lesions on VIA or VILI, regardless of the location of the lesions in the cervix. The biopsy specimen was preserved in a 10.0% formalin solution. The biopsy sections were processed and analyzed using the hematoxylin and eosin [H&E] stain, while slides for PAP smear were stained with PAP stain to ensure accurate diagnosis. Results from the histology examination were classified as either normal, cervical intraepithelial neoplasia I, II, or III, or cervical cancer.

**Statistical analysis:** The obtained data were encoded, processed, and analyzed using Statistical Package for Social Sciences [SPSS] version 26 for Windows® [IBM, SPSS Inc, Chicago, IL, USA]. The qualitative data were presented in the form of numerical values indicating frequency and percentage. The Monte-Carlo test was used to compare groups based on quantitative data. The Kolmogorov-Smirnov test assessed the normality of quantitative data. The quantitative data were presented as the mean value with either the standard deviation [SD] or the range indicated. The Kappa agreement coefficient was utilized to quantify the level of concordance between categorical variables. Significance is attributed to P values less than 0.05 in all tests.

## RESULTS

A total number of 300 females with clinically suspicious cervix were included in the following study. The highest percentage of the cases were in the age group

between 30 and 39 years representing 41.3% followed by the age group between 40 and 49 years representing 32.7%. 4 cases were nullipara [1.3%], 266 cases multipara [88.7%] and 30 cases [grand multipara] [10.0%]. Moreover, 242 cases married once [80.7%], and 58 cases who married more than once [19.3%]. There were 103 smokers among the included cases [34.3%]. Furthermore, 134 cases used contraception [44.7%]. Regarding the type of contraception, IUD was the most common type in 77.6% of the cases who used contraception, followed by COC in 13.4% and injectables in 9.0%. Regarding the symptoms, vaginal discharge was the most common symptom in 118 cases [39.3%] followed by contact bleeding in 83 cases [27.7%], vaginal bleeding in 50 cases [16.7%], pelvic pain in 28 cases [9.3%] and dyspareunia in 17 cases [5.7%] **[Table 1]**.

**Table 2** shows that there were 208 cases with abnormal findings by the pap smear [69.3%]. Regarding the type of abnormal findings, LSIL was the most common finding in 48.1% of the cases with abnormal findings, followed by ASCUS in 46.2%, HSIL in 5.3% then last squamous carcinoma in one case only [0.5%]. Regarding the results of the biopsy, there were 232 cases with abnormal findings by the biopsy [77.3%]. Regarding the type of abnormal findings, LSIL was the most common finding in 77.1% of the cases with abnormal findings, followed by HSIL in 22.4% followed by squamous carcinoma in 0.4%. Also, there were 244 cases with abnormal findings by the colposcope [81.3%]. Regarding the type of abnormal findings, act white positive findings were the most common finding in 94.3% of the cases with abnormal findings, followed by negative Lugol's iodine in 91.0%, positive punctuation in 22.5%, mosaic appearance in 12.3% and atypical vessels in 6.6%.

**Table 3** shows that there is a moderate agreement between pap smear findings and biopsy findings with a statistically significant value [κ= 0.518, P = 0.010]. Pap smear revealed sensitivity of 85.7%, specificity of 75.0%, PPV of 84.0%, NPV of 78.7%, and accuracy of 80.2% as compared to biopsy results. The table also shows that there is a strong agreement between Colposcopic findings and biopsy findings with a statistically significant value [κ= 0.742, P < 0.001]. The colposcopic finding revealed a sensitivity of 91.7%, specificity of 84.3%, PPV of 92.0%, NPV of 82.6%, and accuracy of 86.7% as compared to biopsy results.

**Table 4** shows that there was a statistically significant difference between the age and the pathological findings where there is an increased incidence of Squamous carcinoma in the cases with 50 years or more. Also, there was a statistically significant difference between the pathological findings and parity where there is an increased incidence of normal finings and CIN2 in the cases with grand multipara. Moreover, the table shows that there was a statistically significant difference between the pathological findings and the marital status where there is an increased incidence of different types of cervical cancer with marriage more than once. In addition, there was a statistically significant difference between the pathological findings and smoking where there is an increased incidence of CIN2 and squamous carcinoma in the smoker cases. Furthermore, the table shows that there was a statistically significant difference between the pathological findings and contraception where the use of contraception was associated with a higher incidence of cervical cancer. Finally, there was a statistically significant difference between the pathological findings and the following symptom [Vaginal discharge, contact bleeding, and Vaginal bleeding] where there was no statistically significant difference regarding Pelvic pain and Dyspareunia.

**Table [1]: Demographics and clinical data of the studied patients**

| Variables | | | Study Cases N = 300 |
|---|---|---|---|
| **Age groups** | 20- 29 year<br>30 - 39 years<br>40 - 49 years<br>50 years or more | | 49 [16.3%]<br>124 [41.3%]<br>98 [32.7%]<br>29 [9.7%] |
| **Parity** | Nullipara<br>Multipara<br>Grand multipara | | 4 [1.3%]<br>266 [88.7%]<br>30 [10.0%] |
| **Marital status** | Married once<br>Married more than once | | 242 [80.7%]<br>58 [19.3%] |
| **Smoking** | | | 103 [34.3%] |
| **Contraception** | No | | 166 [55.3%] |
| | Yes | IUD<br>COC<br>Injection | 104 [34.6%]<br>18 [6.0%]<br>12 [4.0%] |
| **Manifestations** | Vaginal discharge<br>Contact bleeding<br>Vaginal bleeding<br>Pelvic pain<br>Dyspareunia | | 118 [39.3%]<br>83 [27.7%]<br>50 [16.7%]<br>28 [9.3%]<br>17 [5.7%] |

**Table [2]: Pap smear, biopsy, and Colposcopic results in the cases of the study**

| Variables | | | Study Cases N = 300 |
|---|---|---|---|
| **Pap smear** | Normal | | 92 [30.7%] |
| | Abnormal | LSIL | 100 [33.3%] |
| | | ASCUS | 96 [32.0%] |
| | | Squamous carcinoma | 1 [0.33%] |
| | | HSIL | 11 [3.66%] |
| **Biopsy** | Normal | | 68 [22.7%] |
| | Abnormal | LSIL | 179 [59.6%] |
| | | HSIL | 52 [17.3%] |
| | | Squamous carcinoma | 1 [0.33%] |
| **Colposcopic findings** | Normal | | 56 [18.7%] |
| | Abnormal | Acetowhite | 230 [76.6%] |
| | | Negative Lugol's iodine | 222 [74.0%] |
| | | Punctuation | 55 [18.3%] |
| | | Mosaic appearance | 30 [10.0%] |
| | | Atypical vessels | 16 [5.3%] |

**Table [3]: Agreement between pap smear results and Colposcopic results with pathological findings**

| Variables | Pap smear N = 300 | Biopsy N = 300 | Test of significance |
|---|---|---|---|
| **Normal** | 92 [30.7%] | 68 [22.7%] | κ= 0.518 |
| **Abnormal** | 208 [69.3%] | 232 [77.3%] | P = 0.010* |
| **Sensitivity** | 85.7% | | |
| **Specificity** | 75% | | |
| **PPV** | 84% | | |
| **NPV** | 78.7% | | |
| **Accuracy** | 80.2% | | |
| **Variables** | **Colposcope N = 300** | **Biopsy N = 300** | **Test of significance** |
| **Normal** | 56 [18.7%] | 68 [22.7%] | κ= 0.742 |
| **Abnormal** | 244 [81.3%] | 232 [77.3%] | P < 0.001* |
| **Sensitivity** | 91.7% | | |
| **Specificity** | 84.3% | | |
| **PPV** | 92% | | |
| **NPV** | 82.6% | | |
| **Accuracy** | 86.7% | | |

κ: Kappa agreement coefficient *: Statistically significant

**Table [4]: Relation between pathological findings and age group**

| Variable | | Normal [N=68] | LSIL [N=179] | HSIL [N=52] | Squamous carcinoma [N=1] | Test of Sign. |
|---|---|---|---|---|---|---|
| **Age** | 20- 29 year | 16 [23.5%] | 29 [16.2%] | 4 [7.7%] | 0 [0.0%] | MC= 48.615 |
| | 30 - 39 years | 21 [30.9%] | 83 [46.4%] | 20 [38.5%] | 0 [0.0%] | P < 0.001* |
| | 40 - 49 years | 31 [45.6%] | 50 [27.9%] | 17 [32.7%] | 0 [0.0%] | |
| | 50 years or more | 0 [0.0%] | 17 [9.5%] | 11 [21.2%] | 1 [100.0.%] | |
| **Parity** | Nullipara | 0 [0.0%] | 4 [2.2%] | 0 [0.0%] | 0 [0.0%] | MC = 6.425 |
| | Multipara | 54 [79.4%] | 167 [93.3%] | 44 [84.6%] | 1 [100.0%] | P = 0.019* |
| | Grand multipara | 14 [20.6%] | 8 [4.5%] | 8 [15.4%] | 0 [0.0%] | |
| **Marital status** | Married once | 65 [95.6%] | 136 [75.9%] | 41 [78.8%] | 0 [0.0%] | MC = 19.742 |
| | Married more than once | 3 [4.4%] | 43 [24.1%] | 11 [21.2%] | 1 [100.0%] | P < 0.001* |
| **Smoking** | | 13 [19.1%] | 61 [34.1%] | 28 [53.8%] | 1 [100.0%] | MC = 16.848 P = 0.001* |
| **Contraception** | | 16 [23.5%] | 82 [45.8%] | 35 [67.3%] | 1 [100.0%] | MC = 20.542 P < 0.001* |
| **Symptoms** | Vaginal discharge | 43 [63.2%] | 63 [35.2%] | 12 [23.1%] | 0 [0.0%] | MC = 25.777 P < 0.001* |
| | Contact bleeding | 8 [11.8%] | 46 [25.7%] | 28 [53.8%] | 1 [100.0%] | MC = 28.422 P < 0.001* |
| | Vaginal bleeding | 5 [7.4%] | 41 [22.9%] | 3 [5.8%] | 1 [100.0%] | MC = 24.663 P < 0.001* |
| | Pelvic pain | 4 [5.9%] | 16 [8.9%] | 8 [15.4%] | 0 [0.0%] | MC = 5.606 P = 0.132 |
| | Dyspareunia | 4 [5.9%] | 13 [7.3%] | 0 [0.0%] | 0 [0.0%] | MC = 4.043 P = 0.257 |

MC: Montecarlo test *: Statistically significant [p< 0.05]

## DISCUSSION

In the current study, the highest percentage of the cases were in the age group between 30 and 39 years representing 41.3% followed by the age group between 40 and 49 years representing 32.7%. This was in line with the findings of **El-Sayed *et al***., who examined 300 patients with the clinically suspicious cervix and demonstrated that 37.0% of cases involved CIN, and that the highest prevalence was observed in the 30-49 age group, with a mean age of 41 years [11]. Similarly, 128 patients with cervical cancer suspicion based on cytologic, colposcopic, and biopsy results were included in the study by **Pleş *et al***. [12], age was the average at 38.95 years.

**Oğlak and Obut**, who assessed the colposcopy findings and Pap-smear results of 163 patients admitted to the colposcopy unit, also provided the results that are discussed here. The majority of the patients were in the reproductive age group, comprising 117 individuals [77.9%] [20-49 years] [13].

In the current study, 4 cases were nullipara [1.3%], 266 cases multipara [88.7%] and 30 cases [grand multipara] [10.0%]. This jibes with the findings of **El-Sayed *et al***., who found that multiparous women had a higher incidence of CIN. Among them, 37.3% were para 2, 39.2% were para 3, and 17.6% had four or more paras [11].

As part of yet another study, **Abdelrahman *et al***. Results from 285 women's colposcopies, as well as their clinical presentations, Pap smears, HPV serotypes, and other diagnostic tests, were examined. According to their findings, 54.19% of them were multiparas [14].

Possible causes include changes in hormones and nutrition brought on by pregnancy, immunosuppression, and cervical trauma from giving birth vaginally.

Cigarette smoke is known to play a role in the development of cervical cancer and precancerous lesions [15]. In the current study, there were 103 smokers among the included cases [34.3%]. This copes with **Oğlak** and **Obut** who showed that the number of smokers was 12 [7.4%] and all of them had normal Pap-smear results [13].

The likelihood of acquiring CIN and invasive disease increased in correlation with the frequency with which sexual partners were experienced. Of the participants in this study, 58 had multiple marriages [19.3%] and 242 had a single marriage [80.7%]. This is not considered as having multiple sexual partners, so this risk factor is not reported in the current study mostly due to religious thoughts that inhibit this issue.

In the current study, vaginal discharge was the most common symptom in 118 cases [39.3%] followed by contact bleeding in 83 cases [27.7%], vaginal bleeding in 50 cases [16.7%], pelvic pain in 28 cases [9.3%] and dyspareunia in 17 cases [5.7%]. **El-Sayed *et al***. found that 56.0% of women complained of excessive white discharge per vagina, and our results corroborated their findings. The results showed that 70.6% of them had CIN [11]. This was also supported by **Prasad *et al***., who included 150 cervical cancer suspects. White discharge [50.0%] and pelvic pain [20.0%] were the most common complaints among symptomatic women, followed by intermenstrual bleeding [12.7%], menorrhagia [8.7%], post-coital bleeding [4.0%], and itching vulva [4.6%] [16]. Similarly, **Garg and Desai** found that white discharge was the most common complaint among 200 symptomatic and healthy cervix-bearing women in their study on sequential screening with cytology and colposcopy for the detection of cervical neoplasia [17]. Additionally, it was determined that excessive vaginal discharge is a risk factor for CIN. In the current study, there were 208 cases with abnormal findings by the pap smear [69.3%]. Regarding the type of abnormal findings, LSIL was the most common finding in 48.1% of the cases with abnormal findings, followed by ASCUS in 46.2%, squamous carcinoma in 3.8%, and HSIL in 1.9%.

Compared to **Oğlak** and **Obut's** findings [13], the percentage was lower. They found that out of 163 patients, 148 [90.7%] had normal pap-smear test results, 10 [6.2%] had ASCUS, and 5 [3.1%] had LSIL.

Recurrent cytological and/or colposcopic evaluations are recommended for ASCUS cases. ASCUS diagnosis was associated with 58.0% normal cervix, 7.0% HSIL, and 0.5% invasive cancer in one study. Thus, even the first abnormal Pap-smear may indicate cancer [18]. **Lang *et al***. [19] observed ASCUS for a period of 14 months. The presence of SIL was detected in 67.0% of patients who underwent biopsy and smear, and in 17.0% of instances that just underwent smear. The authors propose that the use of smear diagnosis for atypical squamous cells of undetermined significance [ASCUS] can predict squamous intraepithelial lesions [SIL]. However, they argue that relying solely on smear follow-up is not as beneficial as biopsy follow-up. **Sankaranarayanan *et al***. [20] identified Atypical Squamous Cells of Undetermined Significance [ASCUS] in 8.8% of the 22663 patients, Low-Grade Squamous Intraepithelial Lesions [LSIL] in 6.2% of the cases, and High-Grade Squamous Intraepithelial Lesions [HSIL] in 1.8% of the cases using cytology. A colposcopy-directed biopsy was performed in 5322 instances. LSIL was detected in 931 instances, HSIL in 355 cases, and invasive cervical cancer in 74 cases.

In the current study, there were 244 cases with abnormal findings by the colposcope [81.3%]. Regarding the type of abnormal findings, act white positive findings were the most common finding in 94.3% of the cases with abnormal findings, followed by negative Lugol's iodine in 91.0%, positive punctuation in 22.5%, mosaic appearance in 12.3% and atypical vessels in 6.6%. The most common type of staining observed was aceto-white staining, which is pH-neutral and can be observed in several circumstances such as flat condyloma, immature squamous metaplasia, the congenital transformation zone, inflammation, and healing and regenerative epithelium. Women displaying these observations necessitate further attention and support. In the study of **Bhalero *et al*** [21], aceto-whiteness was observed in 42.5% of the cases, making it the most prevalent colposcopy feature.

In agreement with **Oğlak** and **Obut**, [13], 121 out of 163 patients [74.2%] had normal Colposcopic examination findings, while 42 [25.8%] had abnormal findings. Colposcopy abnormalities were found in 4 of 10 ASCUS and 3 of 5 LSIL cases. **Abdelrahman *et al***. [14] found acetowhite lesions in 10.0%–42.5% of HPV-positive cases. Higher-grade cytology was associated with mosaicism and typical vasculature in up to 28.0% of cases.

In the current study, there is a moderate agreement between pap smear findings and biopsy findings with a statistically significant value [κ= 0.518, P = 0.010]. Pap smear revealed sensitivity of 85.7%, specificity of 75.0%, PPV of 84.0%, NPV of 78.7%, and accuracy of 80.2% as compared to biopsy results. This matched **Prasad et al**.'s 91.7% pap smear sensitivity. It may have been because it was a hospital-based study and the screening test was given to symptomatic women [16]. These findings partially supported **El-Sayed et al**.'s finding that the pap smear's sensitivity was 25.5% and its specificity 87.0%. Due to the high number of false negative smears [11].

**Abdelrahman *et al***. [14] found pap smear had 68.5% sensitivity and 96.7% specificity compared to histopathology.

In detecting non-benign cervical lesions, Pap smear had a sensitivity of 77.4%, specificity of 69.7%, 21.8%, 95.6%, 70.7%, and 2.55%, according to **Sayyah-Melli *et al*** [23]. **Cuzick *et al***. [24] found that Pap smear had 49.0%-57.0% sensitivity and 96.0%-97.0% specificity for cervical intraepithelial neoplasia or higher-grade lesions.

Pap smear detected non-benign cervical lesions with 34.0% sensitivity, 85% specificity, 76% positive predictive value, and 35.0% negative predictive value, according to **Farzaneh *et al***., [25]. A subjective test like Pap smear can have sampling, fixation, and interpretation errors. More false positives mean fewer disease cases missed. If necessary, colposcopy and histopathology should be performed on symptomatic smear-positive women. The literature gives different Pap-smear sensitivity and specificity values. This is mostly due to differences in Pap-smear verification methods. Cervix histopathology provides the most accurate diagnosis. In 1200 cases, Pap-smear sensitivity was 72.0%, specificity 90.2%, PPV 55.7, and NPV 94.9% [26]. **Rieck *et al***. [27], found Pap-smear sensitivity of 78.9% and specificity of 71.3%. The scarcity of menopause cases may explain the higher Pap smear sensitivity in this study compared to others because menopause causes atrophic changes in the cervix.

In the current study, there is a strong agreement between Colposcopic findings and biopsy findings with a statistically significant value [κ= 0.742, P < 0.001]. Colposcopic findings revealed a sensitivity of 91.7%, specificity of 84.3%, PPV of 92.0%, NPV of 82.6%, and accuracy of 86.7% as compared to biopsy results. According to **El-Sayed *et al***., [11] colposcopy sensitivity was 82.0% and specificity 81.0%. In comparison to Pap smear, colposcopy had high sensitivity and low specificity. Unsuspected Aceto-white [AW] epithelium may have been caused by inflammation, immature metaplasia, erosion, and latent HPV infections. Biopsy confirmed 18 of 53 AW areas without vascular patterns.

According to the results of **Abdelrahman *et al***., the sensitivity and specificity of colposcope as compared to the histopathology were 93.2% and 69.1% respectively [14]. In another study by **Oğlak and Obut**, NPV, PPV, sensitivity, and specificity values were found to be 93.3%, 14.3%, 85.7%, and 76.2% for colposcopy [13]. **Ramesh G *et al***., [28] demonstrate comparable sensitivity but a lower level of specificity [46.4%]. The study conducted by **Chaudhary RD *et al***., [22] reported a sensitivity of 79.37% and a specificity of 81.02%. Furthermore, colposcopy results for cervical lesions are highly consistent with biopsy findings [29, 30].

Colposcopy's accuracy in diagnosing premalignant and malignant cervical lesions depends on its quality, interpretation, operator skill, and result classification. The present investigation revealed a statistically significant correlation between age and pathological findings, namely an elevated occurrence of Squamous carcinoma in individuals aged 50 years or older. These findings align with the study conducted by **Attya *et al***., [31], which showed that the median age of patients with positive results was 47 years, significantly higher than the median age of patients with normal results [37 years] [p<0.001].

Consistent with the current study, **Wang *et al***. [32] discovered that the occurrence of cervical epithelial alterations was greater in those between the ages of 56 and 65 compared to those between the ages of 36 and 45.

The present study revealed a statistically significant disparity between the pathological observations and contraception, with the utilization of contraception being linked to a greater occurrence of cervical cancer. **Khatun *et al***. [33], found that oral contraceptive users for over five years had a higher risk of cervical cancer than non-users. All contraceptives have side effects, so long-term use is not advised. This study found no association between oral contraceptives and cervical cancer risk. According to WHO, oral contraceptives had a 1.19-fold higher relative risk than normal and increased with duration. **Xu *et al***. [34], found that COC use increases CIN II and III risk. **Loopik *et al***. [35] found COC users had higher CIN III levels. CIN2 and CIN3 are high-grade cancer precursors that often become invasive.

In the current study, there was a statistically significant difference between the pathological findings and the marital status where there is an increased incidence of different types of cervical cancer with marriage more than once. **Rahmawati *et al***. [36], found that married women under 20 are at risk. At this age, cervical mucosal cells are immature and sensitive to foreign stimuli, including sperm cell chemicals. Constant stimulation can turn cervical mucous cells into cancerous cells.

According to a study of **Arfailasufandi *et al***. [37], women who engaged in sexual activity before the age of 20 had a significantly greater chance of developing cervical cancer, with an odds ratio of 5.44 and a p-value of less than 0.001.

In the current study, there was a statistically significant

difference between the pathological findings and parity where there is an increased incidence of normal finings and CIN2 in the cases with grand multipara. This contradicted the idea that frequent parity can harm women. High parity increases reproductive health issues.

According to **Arfailasufandi *et al***. [37], women with three or more children were 3.94 times more likely to develop cervical cancer. HPV infection can increase with vaginal delivery trauma.

Normal delivery damages cervical epithelial tissue as the baby passes through the cervix, causing abnormal cell changes. This suggests that cervical cancer risk rises with birthrate. Repeated spontaneous births increase birth canal trauma and HPV cervix infection [38].

The current study's cases had a higher rate of CS, which could eliminate this factor. In the current study, there was a statistically significant difference between the pathological findings and smoking where there is an increased incidence of CIN2 and squamous carcinoma in the smoker cases. This supported Rahmawati et al.'s finding that high cigarette smoke exposure increases HPV infection risk. Cervical intraepithelial neoplasia [CIN] is linked to daily pack smoking. Passive smokers who smoke more than 20 packs per year are 7.2 times more likely to contract HPV [36].

The presence of nicotine in cigarettes can potentially trigger the activation of carcinogenic substances. The presence of nicotine in cigarettes permeates the cervical mucus and activates cells by enveloping the cervix, thus suppressing the immune system and inducing anomalous cell proliferation [39].

**Conclusion:** The study findings demonstrate that colposcopy is significantly more sensitive and accurate compared to pap smear. By integrating pap smear with colposcopy, we can optimize the accuracy and precision of cervical cancer screening.

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