

## Diagnostic Performance between Colposcopy Findings and Histopathology Reports

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### Abstract

**Background:** Cervical cancer is the most frequent cancer in women worldwide. With appropriate screening, the condition can be prevented and treated. Colposcopy is a useful tool in the diagnosis and management of precancerous cervical lesions following primary screening. The gold standard for identifying precancerous lesions is histopathology. **Objective:** The aim of this study is to evaluate the diagnostic performance between colposcopy findings and histopathology reports. **Methods:** The cross-sectional observational study was conducted in the Department of Colposcopy Clinic of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from July 2022 to June 2023. A total of 62 subjects were included in the study. The questionnaire was pretested, corrected and finalized. Data were collected by face-to-face interview and analyzed by appropriate computer based programmed software Statistical Package for the Social Sciences (SPSS), version 24. **Results:** In this study, the mean age was found to be 36.8±11.9 years, with a range from 20 to >51 years maximum 44 (71.0%) of the patients were within the age group of 20 - 40 years. The majority 37 (59.7%) of patients completed SSC and most of the patients 56 (90.3%) were housewives. Most of the patients 59 (95.2%) were Muslims and about 32 (51.6%) came from middle-income families. About 25 (40.3%) patients were married between the ages of 15-17 years. About 25 (40.3%) were between 16-18 years during their first delivery and about 26 (41.9%) had 3-4 children and 21 (33.9%) had more than 4 children. Most of the patients 43(69.4%) had history of received OCP. Regarding colposcopic diagnosis, 12.9% (n=8) were normal, 69.4% (n=43) were CIN I, 9.7% (n=6) were CIN II and 8.1% (n=5) were CIN III and 30.6% (n=19) chronic cervicitis, 46.8% (n=29) CIN I, 6.5% (n=4) CIN II, 6.5% (n=4) CIN III, 4.8% (n=3) carcinoma in situ and 4.8% (n=3) were invasive squamous cell carcinoma by the histopathological diagnosis. **Conclusion:** Colposcopy had a rather high diagnostic accuracy for histopathologically verified precancerous cervical lesions. Even if the results of the screening tests are normal, patients who report with postcoital and postmenopausal bleeding should have colposcopies and biopsies. Colposcopy also has a high sensitivity, therefore it is simple to use the "see and treat" approach to lower dropout rates.

**Key words:** Colposcopy, Cervical Precancerous Lesions, Histopathology.

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## INTRODUCTION

Cervical cancer is most frequent cancer in women worldwide. It is expected that 5,30,000 new cases occurred in 2022. It is predicted to cause over 2,70,000 fatalities annually. Greater than 85% of these fatalities take place in underdeveloped areas [1]. An estimated 4, 45,000 new cases were reported in the less developed areas in 2012.

According to estimates, 6,582 deaths and 11,956 new cases of cervical cancer occurred in Bangladesh in 2012, making it the second most frequent malignancy among females [2]. The most frequent reproductive cancer among women in Bangladesh is cervical cancer, and the majority of these patients appear when it is too late [3]. Bangladeshi women have one of the highest rates of death from cervical cancer [4]. Over 80% of individuals with this very preventable malignancy arrive at clinically advanced and incurable stages of the disease [5].

As per the International Agency for Research on Cancer (IARC's) projections for coming decades, deaths from cervical cancer will continue to rise [6].

Undoubtedly, the most prevalent HPV-related illness is cervical cancer. Seventy percent of precancerous cervical lesions and cervical cancer are caused by HPV 16 and 18. In 2008, Dr. Zur Hausen received the Nobel Prize in Physiology or Medicine in recognition of his groundbreaking work identifying the connection between HPV and cervical cancer [7,8].

When precancerous tumors progress to actual cancer and infiltrate the surrounding tissues, symptoms start to appear. Common symptoms include post-coital bleeding, postmenopausal bleeding, intermenstrual bleeding, severe vaginal bleeding, and atypical vaginal discharge that may smell bad and be tinged with blood. One of the main indicators of cervical cancer is thought to be postcoital bleeding [9].

As per USPSTF (United States Preventive Services Task Force) recommendation for cervical cancer screening: women aged 21 to 65 years are recommended to undergo screening with Papanicolaou smear every 3 years or, for those women between 30 to 65 years who want to lengthen their screening interval are recommended to screen with a combination of cytology and HPV testing every 5 years [10].

Bangladesh's national cervical cancer screening program was started as a pilot project in 2004 and expanded to a nationwide initiative in 2005.3. The government screening test program in Bangladesh is called VIA. Women 30 years of age and older are subjected to screening tests. Colposcopy compliance was high; however, therapy was not given to almost half of the patients with high-grade precancerous lesions. The

practice of "see and treat" was seldom followed, and cryotherapy was not used frequently. One of the first nations in the world to implement VIA as the screening test for its national program to detect cervical cancer is Bangladesh [11].

If the test is negative, the woman must attend at least two appointments; if the test is positive, she must attend frequently. This is the requirement of conventional cervical cancer screening and prevention programs. In low resource areas, however, the repeated visit-based screening programs have not been able to lower cancer rates. The novel "Screen and Treat" or "See and Treat" single-visit strategy has been created to enhance the results. A "see and treat" approach reduces the possibility of losing follow-up, even though overtreatment is still possible [12]. Studies have shown the advantages of "see and treat," particularly in nations with limited resources [13–15]. VIA and cryotherapy were implemented for screening and treatment by the government partners at demonstration sites in Peru, Uganda and Vietnam. Evaluations in these three countries to explore barriers and facilitating factors showed that use of VIA and cryotherapy is a feasible approach in these settings for cervical cancer prevention services [13]. The most important role of cervical cancer screening tests is to identify the woman with high grade squamous intra-epithelial lesions (HSIL) because the LSIL are frequently regressive [16].

"Screen and treat" methods were suggested by a WHO expert group for patients with cervical intraepithelial lesions. The suggested screening techniques are HPV test only, HPV test plus VIA, HPV test plus cytology. The recommended course of treatment is LEEP or cryotherapy. The application of cold knife cauterization (CKC) as a treatment in a screen-and-treat approach was not advised by the expert panel [17]. In Bangladesh, there are no official guidelines endorsing the "see and treat" or "screen and treat" strategies. Nevertheless, Nessa *et al.*, [5] came to the conclusion that rather than waiting for biopsy confirmation before starting treatment, cryotherapy or LEEP should be administered as soon as possible after the initial colposcopy. Due to increased treatment compliance, this strategy might help more women, but it also runs the risk of leading to overtreatment.

## METHODOLOGY

The cross-sectional observational study was conducted in the Department of Colposcopy Clinic of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from July 2022 to June 2023. A total of 62 married women with the following complaints were enrolled in the study: intermenstrual bleeding, postcoital bleeding, postmenopausal hemorrhage, and positive visual inspection of the cervix (VIA + ve) with 3-5% acetic acid. The subjects provided written informed consent. The questionnaire underwent pretesting, editing, and finalization. The questionnaire

that was given by the interviewer was used to collect the data. Sixty-two participants had their cervix examined colposcopically. In situations of VIA +ve women, a colposcopy-guided punch biopsy or loop electrosurgical excision procedure (LEEP) from the acetowhite area was taken; in cases of VIA -ve women with other reasons, a cervical biopsy was randomly taken in the four quadrants (1, 5, 7, & 11 O'clock position). Specimens were examined histopathologically in the BSMMU Department of Pathology. After collection, the data were

checked and cleaned, followed by editing, compiling, coding, and categorizing according to the objectives and variable to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

## RESULT

**Table I: Distribution of the patients according to age (n = 62)**

Age group	Frequency	%
20 – 30 years	22	35.5
31 - 40 years	22	35.5
41 - 50 years	11	17.7
> 51 years	7	11.3
Total	<b>62</b>	<b>100.0</b>
Mean±SD = 36.8±11.9 years		

Table I shows that, the mean age was found to be 36.8±11.9 years, with a range from 20 to >51 years maximum 44 (71.0%) of the patients were within the age

group of 20 - 40 years and minimum 7 (11.3%) of the patients were in the age >51 years

**Table II: Distribution of the patients according to educational status (n = 62)**

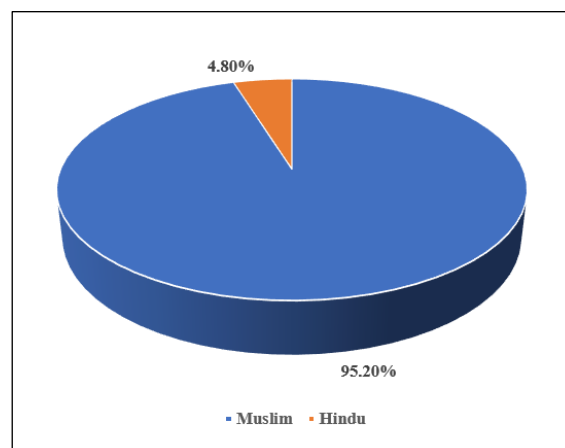
Educational status	Frequency	%
Illiterate	8	12.9
primary	37	59.7
SSC	8	12.9
HSC	4	6.5
Graduate & above	5	8.1
Total	<b>62</b>	<b>100.0</b>

Table II shows that, the majority 37 (59.7%) of patients completed SSC and 8 (12.9%) patients were illiterate

**Table III: Distribution of the patients according to occupational status (n = 62)**

Occupational status	Frequency	%
Housewife	56	90.3
Service holder	6	9.7
Total	<b>62</b>	<b>100.0</b>

Table III shows that most of the patients 56 (90.3%) were housewives and 6 (9.7%) were service holder



**Figure I: Distribution of patients according to religion (n = 62)**

Figure I shows that, most of the patients 59 (95.2%) were Muslims and 3 (4.8%) were Hindu.

**Table IV: Distribution of the patients according to average monthly income (n = 62)**

Average monthly income (Taka)	Frequency	%
Low	13	27.4
Meddle	32	51.6
High	17	20.0
Total	62	100.0

Table IV shows that most of the patients 32 (51.6%) came from middle-income families.

**Table V: Distribution of the patients according to age at marriage (n = 62)**

Age at marriage (years)	Frequency	%
<15	20	32.3
15-17	25	40.3
18-20	12	19.4
>20	5	8.1
Total	62	100.0

Table V shows that 25 (40.3%) patients were married between the ages of 15-17 years and 20 (32.3%) patients were married in the ages of <15 years

**Table VI: Distribution of the patients according to Age at first delivery (n = 62)**

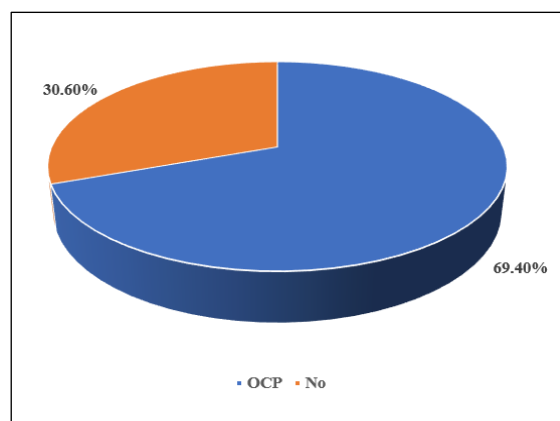
Age at first delivery (years)	Frequency	%
≤15	11	17.7
16-18	25	40.3
19-21	17	27.4
>21	9	14.5
Total	132	100.0

Table VI shows 25 (40.3%) were between 16-18 years during their first delivery and 11 (17.7%) were in ≤15 years during their first delivery

**Table VII: Distribution of the patients according to parity (n = 62)**

Parity	Frequency	%
No child	1	1.6
1-2 children	14	22.6
3-4 children	26	41.9
>4 children	21	33.9
Total	62	100.0

Table VII shows that 26 (41.9%) had 3-4 children and 21 (33.9%) had more than 4 children



**Figure II: Distribution of patients according to contraceptive history (n = 62)**

Figure II shows that, most of the patients 43(69.4%) had history of received OCP.

**Table VIII: Distribution of the patients according to colposcopy diagnosis (n = 62)**

Colposcopy parameters	Frequency	%
Normal	8	12.9
CIN I	43	69.3
CIN II	6	9.7
CIN III	5	8.1
Total	<b>62</b>	<b>100.0</b>

Table VIII shows that regarding colposcopic diagnosis, 12.9% (n=8) were normal, 69.4% (n=43) were CIN I, 9.7% (n=6) were CIN II and 8.1% (n=5) were CIN III.

**Table IX: Distribution of the patients according to histopathologic diagnosis (n = 62)**

Histopathological parameters	Frequency	%
Chronic cervicitis	19	30.6
CIN I	29	46.8
CIN II	4	6.5
CIN III	4	6.5
CIS	3	4.8
Cancer	3	4.8
Total	<b>62</b>	<b>100.0</b>

Table IX shows that regarding histopathological diagnosis, 30.6% (n=19) chronic cervicitis, 46.8% (n=29) CIN I, 6.5% (n=4) CIN II, 6.5% (n=4) CIN III, 4.8% (n=3) carcinoma in situ and 4.8% (n=3) were invasive squamous cell carcinoma.

## DISCUSSION

The aberrant proliferation of cells on the surface of the cervix that may eventually result in cervical intraepithelial neoplasia (CIN) is known to cause cervical cancer (CC). The cervix cell's precancerous change is known as CIN. A 1-3 scale is used to grade CIN, with 3 representing the most aberrant. A Human Papilloma Virus (HPV) infection is required for the development of CIN; however, not all HPV infections result in CC. Many women infected with HPV never experience CC or CIN; in these circumstances, the HPV infection goes away on its own. But people who have an HPV infection that lasts longer than a year or two are more likely to get a higher grade of CIN.

The cross-sectional observational study was conducted in the Department of Colposcopy Clinic of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from July 2022 to June 2023. A total of 62 married women were enrolled in the study.

In this study, the mean age was found to be  $36.8 \pm 11.9$  years, with a range from 20 to >51 years maximum 44 (71.0%) of the patients were within the age group of 20 - 40 years and minimum 7 (11.3%) of the patients were in the age >51 years. In a study conducted by Parvin *et al.*, 2016, the mean age of the study population was  $37.57 \pm 9.41$  years, range from 20 to 60 years. The mean age of marriage of the study population was  $16.33 \pm 3.35$  years, range 10-30 years and mean age

of delivery was  $19.24 \pm 3.91$  years, range 13- 38 years [18]. The majority 37 (59.7%) of patients completed SSC and 8 (12.9%) patients were illiterate and most of the patients 56 (90.3%) were housewives and 6 (9.7%) were service holder. Most of the patients 59 (95.2%) were Muslims and 3 (4.8%) were Hindu and about 32 (51.6%) came from middle-income families. About 25 (40.3%) patients were married between the ages of 15-17 years and 20 (32.3%) patients were married in the ages of <15 years. About 25 (40.3%) were between 16-18 years during their first delivery and 11 (17.7%) were in  $\leq 15$  years during their first delivery. About 26 (41.9%) had 3-4 children and 21 (33.9%) had more than 4 children. Most of the patients 43(69.4%) had history of received OCP. Regarding colposcopic diagnosis, 12.9% (n=8) were normal, 69.4% (n=43) were CIN I, 9.7% (n=6) were CIN II and 8.1% (n=5) were CIN III and regarding histopathological diagnosis, 30.6% (n=19) chronic cervicitis, 46.8% (n=29) CIN I, 6.5% (n=4) CIN II, 6.5% (n=4) CIN III, 4.8% (n=3) carcinoma in situ and 4.8% (n=3) were invasive squamous cell carcinoma. In a study conducted by Rosenthal *et al.*, 2001 in 314 women presenting with postcoital bleeding, 3% (n=9) had cervical cancer, 5% (n=17) had CIN I, 12% (n=37) had CIN II-III and rest of them having others disease. In the same study, the authors reported cervical cancer in 0.6% of women with postcoital bleeding who had normal looking cervixes and normal smear [9]. Study by Boicea *et al.*, 245 patients who presented with malignant findings at colposcopy and biopsy. Colposcopic findings in their study group: 11.4% (n=28) cases were CIN I, 20.4% (n=50) CIN II, 61.2% (n=150) CIN III, 5.3% (n=13) microinvasive carcinoma and 1.6% (n=4) CIS. Histopathological results were: 1.6% (n=4) cases normal, 10.6% (n=26) CIN I, 22.4% (n=55) CIN II,



56.3% (n=138) CIN III, 6.1% (n=15) microinvasive carcinoma and 2.8% (n=7) CIS.

A cross-sectional and comparative study conducted by Nessa *et al.*, (2019) evaluated the feasibility of the 'see and treat' protocol for the management of high-grade cervical intraepithelial neoplasia (CIN) at a colposcopy clinic in Bangladesh. During the first and second periods, 48 of 87 and 55 of 73 histology-proven high-grade CIN cases, respectively, received treatment. Among the study population, 37.3% of women who had normal or CIN-I in histology were treated unnecessarily in the second period. The compliance to treatment improved by 20% and failure to receive treatment fell by 20%; these changes were statistically significant [20].

Nessa *et al.*, (2019) observed that cervical cancer is the second-most common cancer among women in Bangladesh. The Government of Bangladesh (GOB) has introduced a cervical cancer screening program through Visual Inspection of Cervix with Acetic Acid (VIA). Screen positive cases are referred to the colposcopy clinics of tertiary level health-care facilities (BSMMU/15 Medical College Hospitals) for evaluation and management. From January 2005 to June 2018, 2012752 VIA tests were performed at different facilities throughout the country; among the tested women, 92037 (4.5%) were found VIA-positive. Among the women with VIA-positive reports, 26773 (29.1%) attended the colposcopy clinic of BSMMU, of which 11501 (44.0%) had precancerous and 1897 (7.0%) had cancerous conditions of the cervix. 3563 (13.30%) were treated by local excision (LEEP, Loop Electrosurgical Excision Procedure), 2781 (10.40%) by local ablative method (thermal ablation) and 1646 (6.15%) women with cervical cancer were referred to oncology [20].

This retrospective cross-sectional study by Nessa *et al.*, (2020) evaluated the colposcopy outcomes and the association of different demographic and reproductive risk factors with cervical pre-cancer and cancer. A total of 16147 women attended the colposcopy clinic of BSMMU with VIA positive reports. Among them, 65.73% of women were referred from different VIA centers in the Dhaka district. The mean age of marriage of the subjects was 16.93 ( $\pm 1$ ) and the mean age of 1st delivery was 18.45 years ( $\pm 4.10$ ). Almost three-fourths of them were married before 18 years and had their 1st delivery by 20 years. Colposcopy examination of the VIA positive women revealed that 36.7% had CINI, 10.6% had CINII/ III, and 7.1% had carcinoma of cervix. Considering CIN as a disease, the Sensitivity, Specificity, PPV and NPV of colposcopy were found at 99.7%, 75.3%, 70.3% and 99.8%, respectively. On the other hand, considering CIN2+ as a disease, the sensitivity, specificity, PPV and NPV of colposcopy were found at 73.8%, 92.7%, 64.4% and 95.2%, respectively. Statistical analysis revealed that higher age ( $p=0.000$ ), lower level of education

( $p=0.007$ ), lower socio-economic status ( $p=0.014$ ), and higher parity ( $p=0.001$ ) had an individual influence on cervical pre-cancer and cancer. This study indicated higher age, low level of education, lower socio-economic condition and higher parity as the most critical socio-demographic factors for developing cervical pre-cancer and cancer in Bangladesh [21].

## CONCLUSION

Colposcopy has a good diagnostic accuracy rate for histopathologically verified precancerous cervical lesions. Regardless of the results of a colposcopic examination, a cervical biopsy should be performed for histological confirmation in women who report with postcoital and postmenopausal hemorrhage. It is recommended that women who come with postmenopausal hemorrhage have endocervical curettage (ECC). Otherwise, if simply colposcopy is taken into consideration, a sizable number of high-grade lesions or invasive cancer will be missed.

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