

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20232711>

Original Research Article

Evaluate the effectiveness of various diagnostic criteria and treatment outcomes in colposcopy screening for cervical cancer in a tertiary care medical college and hospital

Umme Parveen*, Ayesha Nigar Nur, Shahin R. Chowdhury

Department of Obstetrics and Gynecology, Holy Family Red Crescent Medical College, Dhaka, Bangladesh

Received: 02 July 2023

Revised: 06 July 2023

Accepted: 07 August 2023

*Correspondence:

Dr. Umme Parveen,

E-mail: ummeparveen@live.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Cervical cancer is a significant health concern, particularly in developing countries like Bangladesh. This study aimed to evaluate the efficacy of diagnostic criteria and treatment outcomes in cervical cancer screening using colposcopy.

Methods: A retrospective study was conducted at Holy Family Red Crescent Medical College and Hospital, involving 110 female participants from January 2016 to December 2018. Inclusion criteria included women with symptoms such as vaginal discharge or postcoital bleeding, an unhealthy cervix or cervical erosion, abnormal Pap smear results, or positive VIA tests. Exclusion criteria were applied to ensure the integrity of the study.

Results: The study included participants ranging from 20 to 60 years old. Among the age groups, individuals aged 31-40 were the most represented, accounting for 43% of the total population. The second largest group was those aged 20-30, comprising 29% of the participants. The mean and SD of the population is 27.5 ± 14.36 . The most prevalent reasons for referral were an unhealthy cervix (31%), white discharge (26%), and cervical erosion (18%). Other indications included post-coital bleeding (9%), abnormal Pap smear results (11%), positive results for VIA (3%) and HPV DNA (2%). LLETZ was performed in 6% of cases for the treatment of abnormal cervical cells, while EC was conducted in 18% of cases to collect tissue samples from the endocervical canal.

Conclusions: The study highlights the importance of colposcopy in the screening process for cervical cancer, allowing for the detection of abnormalities and subsequent interventions. The findings contribute to the understanding of diagnostic criteria, treatment outcomes, and the need for early detection and prevention of cervical cancer.

Keywords: Biopsy, Cervical cancer, Colposcopy, Diagnostic criteria, HPV DNA, LLETZ, Screening

INTRODUCTION

Cervical cancer ranks as the third most prevalent form of cancer in women worldwide and is particularly widespread in developing countries. Approximately 80% of cervical cancer cases occur in these regions. In Bangladesh, a staggering 17,686 women are diagnosed with cervical cancer each year, and sadly, 10,364 lose their lives to this disease. Fortunately, cervical cancer is a preventable

condition, thanks to the effectiveness of various screening, diagnostic, and therapeutic procedures. The screening methods commonly employed include VIA (Visual Inspection with acetic acid), Pap smear, and HPV DNA testing. Three recent developments show promise to reduce cervical cancer incidence in the United States. In 2016, the U. S. Food and Drug Administration approved a two-dose series of the 9-valent human papillomavirus

(HPV) vaccine for children aged nine to 14.¹ For patients aged 15 to 26, a three-dose series is recommended.²

Educating families about two-dose HPV vaccination should lead to improved vaccine initiation rates and the shorter series should improve vaccine completion rates. The U.S. Preventive Services Task Force endorsed HPV-only cervical cancer screening every five years for women 30 and older as an alternative to screening with cytology every three years or co-testing with cytology and HPV every five years.³ HPV self-sampling accuracy is similar to traditional office-based clinician sampling, and it has the potential to improve access to cervical cancer screening.⁴ Colposcopy plays a crucial role in the screening process, involving the examination of the cervix for further evaluation, including colposcopy-directed biopsy, as well as the treatment of CIN (Cervical Intraepithelial Neoplasia). Invasive cervical cancers typically develop after a lengthy preinvasive phase, characterized by CIN. The severity of CIN is categorized into grades 1, 2, and 3, based on the proportion of epithelial thickness that exhibits mature and undifferentiated cells. The precancerous stage can endure for a considerable period, spanning between 7 to 20 years.

When women experience symptoms such as bothersome vaginal discharge or postcoital bleeding, or when an examination reveals cervical erosion or an unhealthy cervix, it becomes crucial to ascertain whether these signs indicate a benign condition, an associated infection, CIN, or even malignancy. Lastly, in 2018, the U.S. Food and Drug Administration expanded its approval of the three-dose 9-valent HPV vaccine to people between the ages of 27 and 45. The Centers for Disease Control and Prevention’s Advisory Committee on Immunization Practices recommends shared clinical decision-making for patients in this age group who are not vaccinated or who are under-vaccinated and might benefit from HPV vaccination.⁵ Because older patients are less likely to clear high-risk HPV infections this could decrease cervical

cancer incidence.⁵ HPV vaccination and screening have tremendous potential to save lives; however, it is important to note that 15% to 20% of cervical cancers in the United States are adenocarcinomas, and the incidence is rising.^{6,7} The association between HPV and adenocarcinoma is less pronounced than for squamous cell carcinoma of the cervix, which accounts for more than 70% of cervical.

METHODS

During the period from January 2016 to December 2018, a retrospective study was conducted in the Department of Obstetrics and Gynecology at Holy Family Red Crescent Medical College and Hospital (HFRCMCH). The study population consisted of 110 individuals. The study focused on evaluating the efficacy of certain diagnostic criteria and treatment outcomes.

To ensure accurate results, specific inclusion and exclusion criteria were applied.

Inclusion criteria encompassed women who presented symptoms such as vaginal discharge or postcoital bleeding. Additionally, women with an unhealthy cervix or cervical erosion, those with abnormal Pap smear results, and individuals who tested positive for VIA were included in the study.

Conversely, certain exclusion criteria were implemented to maintain the study's integrity. Pregnant women were excluded, as were those who had previously undergone hysterectomy. Furthermore, individuals displaying clinical evidence of acute pelvic infection or who had previously received treatment for CIN or cervical cancer were also excluded. By meticulously selecting the participants based on these criteria, the study aimed to provide a comprehensive analysis of the study population and assess the effectiveness of various diagnostic and treatment approaches within the specified timeframe.

Table 1: Modified Reid’s colposcopic index (RCI).

Colposcopy signs	Zoro point	One point	Two Pont
Colour	Low-intensity acetowhitening (not completely opaque); indistinct acetowhitening; transparent or translucent acetowhitening beyond the margin of the transformation zone pure snow- white colour with intense surface shine.	Intermediate shade-grey/white colour and shiny surface (most lesions should be scored in this category).	Dull, opaque, oyster white; grey.
Lesion margin and surface configuration	Microcondylomatous or micropapillary contour flat lesions with indistinct margins feathered or finely scalloped margins angular, jagged lesions. Satellite lesion beyond the margin of the transformation zone ^{1,3} .	Regular-shaped, symmetrical lesions with smooth, straight outline	Rolled, peeling edges Internal demarcations between areas of differing colposcopy appearance-a central area of high-grade change and peripheral area of low-grade change ² .

Continued.

Colposcopy signs	Zero point	One point	Two Pont
Vessels	Fine/uniform-caliber vessels closely and uniformly placed poorly formed patterns of fine punctation and/or mosaic vessels beyond the margin of the transformation zone. Fine vessels within Microcondylomatous micropapillary lesions ^{4,6} .	Absent vessels	Well-defined coarse punctuation or mosaic sharply demarcated and randomly and widely placed+5.
Iodine staining	Positive iodine uptake giving mahogany-brown color negative uptake of insignificant lesion i.e. yellow staining by a lesion scoring three points or less on the first three criteria areas beyond the margin of the transformation zone, conspicuous on colposcopy, evident as iodine-negative areas (such areas are frequently due to parakeratosis) ⁷ .	Partial iodine uptake-variegated speckled appearance.	Negative iodine uptake of significant lesion, i.e., yellow staining by a lesion already scoring four points or more on the first three criteria.

Table 2: Colposcopic prediction of histologic diagnosis using the RCI.

RCI (overall score)	Histology
0-2	Likely to be CIN 1
3-4	Overlapping lesion: likely to be CIN 1 or CIN 2
5-8	Likely to be CIN 2-3

RESULTS

Table 3 provides information on the distribution of populations in a study focused on colposcopy, categorized by age groups. The study included participants ranging from 20 to 60 years old. Among the age groups, individuals aged 31-40 were the most represented, accounting for 43% of the total population. The second largest group was those aged 20-30, comprising 29% of the participants. The mean and SD of the population is 27.5±14.36.

Table 3: Age of the patient (n=110).

Age	Population	Percentage (%)
20-30	32	29
31-40	48	43
41-50	21	19
51-60	09	8
Mean±SD	27.5±14.36	

Table 4 displays the indications for referral to colposcopy in the study population. The most prevalent reasons for referral were an unhealthy cervix (31%), white discharge (26%), and cervical erosion (18%). Other indications included post-coital bleeding (9%), abnormal Pap smear results (11%), and positive results for VIA (3%) and HPV DNA (2%).

Table 5 provides an overview of colposcopy findings based on Reid's index in a study population of 110

individuals. The findings reveal that ectropion was the most common colposcopy finding, observed in 35% of the participants, followed by CIN1 (0-2) in 30% of the cases. The normal category accounted for 25% of the participants, while unsatisfactory results were found in 3% of the cases. CIN I-II (3-4) represented 7% of the participants.

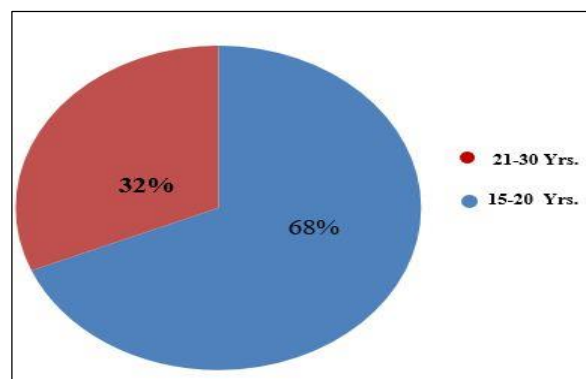


Figure 1: The women got married at 15-20 years of age.

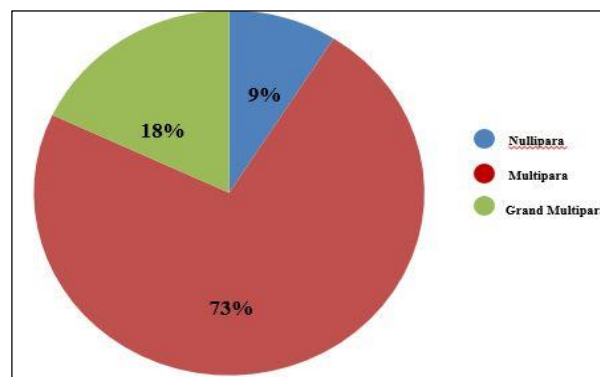


Figure 2: Only 9% of women were nulliparous, rest were multiparous.

Table 6 shows that 32% of the study participants underwent biopsy for histopathological analysis, confirming or ruling out cervical abnormalities. LLETZ was performed in 6% of cases for the treatment of abnormal cervical cells, while EC was conducted in 18% of cases to collect tissue samples from the endocervical canal.

Table 4: Indication for referral to colposcopy.

	Population	Percentage
White discharge	29	26
Unhealthy cervix	34	31
Cervical erosion	20	18
Post coital bleeding	10	9
Abnormal pap smear	12	11
VIA (+ve)	03	3
HPV DNA (+ve)	02	2

Table 5: Colposcopy finding (n=110) according to Reid's Index.

Colposcopy Finding	Population	Percentage (%)
Normal	27	25
Unsatisfactory	4	3
Ectropion	38	35
CIN1 (0-2)	33	30
CIN I-II (3-4)	8	7

Table 6: Action plan for colposcopy.

	Population	Percentage (%)
Biopsy	35	32
LLETZ	6	6
EC	20	18

Table 7: Correlation of colposcopy findings and histopathology reports.

Colposcopy findings	Biopsy findings
Normal (n=80)	Not taken
Unsatisfactory (n=30)	-
Score 0-2 (n=20)	CIN 1
Score 3-5 (n=25)	CIN 2
Score 6-8 (n=35)	CIN 3

DISCUSSION

Cervical cancer has an uneven geographic distribution with the majority of cases being in developing countries. Declining trends in developed countries over the last few decades are attributed to the implementation of organized screening programs by Pap smear. A study on sequential screening with cytology and colposcopy in the detection of cervical neoplasia on 200 symptomatic women and women with an unhealthy cervix, also observed similar results with white discharge being the most common

complaint, i.e. 58.5%.⁸ The present study on 110 symptomatic women and women with unhealthy cervix sequential screening with cytology and colposcopy shows that 26% had abnormal colposcopy findings. Sequential screening with cytology and colposcopy in the detection of cervical neoplasia on 200 symptomatic women and women with an unhealthy cervix, also observed similar results with white discharge being the most common complaint, i.e., 58.5%.⁹ In a study by Kumari et al on colposcopy in cervical erosion patients, 68% had normal findings and 30% had abnormal colposcopy.¹⁰

In our study on colposcopy in cervical patients 25% are normal. In the study by Bangal et al out of 100 patients with cervical erosion, 67% had normal colposcopic findings and 30% had abnormal findings.¹¹ In another study, the authors found a positive predictive value of 67.5% in patients with abnormal PAP results and colposcopy-directed biopsy. They suggested that colposcopy-directed biopsy to be the best choice for the evaluation of patients with abnormal Pap results.¹² This study also concluded that there is a correlation between the acetowhite epithelium and the flat leukoplakia and CIN 1 and coarse punctation, coarse mosaic, and coarse leukoplakia correlate with the presence of CIN Kavanagh studied the consequences of the current patterns of the Pap smear and colposcopy use in the Australian capital territory.¹³ He found that 44% of the women had undergone Pap smear examinations and that 2.5% had undergone colposcopy. The ratio of the women who had undergone Pap smear examinations to the women who had undergone colposcopy was 17-8:1. An estimated 247 women had undergone colposcopy for every cervical cancer death. A 15-year-old woman who is exposed to the current rates of colposcopy (adjusted for hysterectomy) has a 76.8% chance of having a colposcopy during her lifetime. He concluded that many more women will have colposcopy than will develop cervical cancer, which undermines the cost-effectiveness of Australia's cervical cancer screening programme.¹⁴

When compared with cytological findings, women having more than one miscarriage were significantly more likely to have atypical squamous cell carcinoma-cannot exclude HSIL. One patient with atypical glandular cells not otherwise specified had no miscarriage history while high-grade squamous intraepithelial lesion and low-grade squamous intraepithelial lesion had one miscarriage history each. LSIL and HSIL on cytology were found to be more prevalent in patients who started sexual activity before 20 years of age.¹⁵ Prior work has also shown that using lesion characteristics to define lesion grade is problematic since experienced colposcopists disagree over how terms should be applied (8) and how grading should be derived from observed images.¹⁶

Limitations of the study include potentially small sample size and selection bias, as well as reliance on retrospective data. The short duration of follow-up and lack of a control group may affect the accuracy of treatment outcome

evaluation. Additionally, subjectivity in colposcopy and possible confounding factors could impact the study's validity. Conducted in a single center, external generalizability may be limited, and ethical considerations should be acknowledged.

CONCLUSION

Colposcopy offers an excellent tool for evaluating cervical lesions. Earlier detection of CIN in adult women is a desirable goal. Invasive cancer of the cervix is considered to be preventable since it is associated with a pre-invasive stage making it amenable to screening and treatment. Colposcopy should be introduced and encouraged practiced in all tertiary care centers in developing countries as it is a good diagnostic tool for premalignant conditions. Colposcopy should be performed by properly trained and skilled providers. Wide use of colposcopy in a screening program in Bangladesh can reduce morbidity and mortality.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Meites E, Kempe A, Markowitz LE. Use of a 2-dose schedule for human papillomavirus vaccination—updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep.* 2016;65(49):1405-8.
2. Meites E, Szilagyi PG, Chesson HW, Unger ER, Romero JR, Markowitz LE. Human papillomavirus vaccination for adults: updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep.* 2019;68(32):698-702.
3. Kim JJ, Burger EA, Regan C, Sy S.. Screening for cervical cancer in primary care; a decision analysis for the US Preventive Services Task Force. *JAMA.* 2018;320(7):706-14.
4. Polman NJ, Ebisch RM, Heideman DA, Melchers WJ, Bekkers RL, Molijn AC, et al. Performance of human papillomavirus testing on self-collected versus clinician-collected samples for the detection of cervical intraepithelial neoplasia of grade 2 or worse: a randomised, paired screen-positive, non-inferiority trial. *Lancet Oncol.* 2019;20(2):229-38.
5. Rodríguez AC, Schiffman M, Herrero R, Hildesheim A, Bratti C, Sherman ME, et al. Longitudinal study of human papillomavirus persistence and cervical intraepithelial neoplasia grade 2/3: critical role of duration of infection. *J Natl Cancer Inst.* 2010;102(5):315-24.
6. Smith HO, Tiffany MF, Qualls CR, Key CR. The rising incidence of adenocarcinoma relative to squamous cell carcinoma of the uterine cervix in the United States—a 24-year population-based study. *Gynecol Oncol.* 2000;78(2):97-105.
7. Wang SS, Sherman ME, Hildesheim A, Lacey Jr JV, Devesa S. Cervical adenocarcinoma and squamous cell carcinoma incidence trends among white women and black women in the United States for 1976-2000. *Cancer.* 2004;100(5):1035-44.
8. Richa G, Ranjana D. Cytologic and colposcopic evaluation of all symptomatic women at tertiary care centre. *Int J Adv Med.* 2017;4(3):799-804.
9. Garg R, Desai R. Cytologic and colposcopic evaluation of all symptomatic women at the tertiary care centre. *Int J Adv Med* 2017;4(3):799-804.
10. Kumari M, Murari K, Kumari M. Role of colposcopy in management of cervical erosion in rural population of Eastern Bihar. *Inter J Cur Res.* 2016;8(11):41268-70.
11. Bangal VB, Patil NA, Gavhane SP, Shinde KK. Colposcopy guided management of cervical erosions in rural population. *Sch J App Med Sci.* 2014;2(1C):261-5.
12. Farideh D, Nahid A. A comparative study on colposcopy directed biopsy and Pap smear tests in patients with an abnormal Pap smear. *Iranian J Pathol.* 2006;1:13-6.
13. Pimple SA, Amin G, Goswami S, Shastri SS. Evaluation of colposcopy vs cytology as a secondary test in triage women was found to be positive on the visual inspection tests. *Indian J Cancer.* 2010;47(3):308-13.
14. Kavanagh AM, Santow G, Mitchell H. Consequences of the current patterns of the Pap smear and colposcopy use. *J Med Screen.* 1996;3(1):29-34.
15. Duraisamy K, Jaganathan KS, Bose JC. Methods of detecting cervical cancer. *Adv Biol Res.* 2011;5(4):226-32.
16. Massad LS, Jeronimo J, Katki HA, Schiffman M. The accuracy of the colposcopic grading for the detection of high-grade cervical intraepithelial neoplasia. *J Low Genit Tract Dis.* 2009;13(3):137-44.

Cite this article as: Parveen U, Nur AN, Chowdhury SR. Evaluate the effectiveness of various diagnostic criteria and treatment outcomes in colposcopy screening for cervical cancer in a tertiary care medical college and hospital. *Int J Reprod Contracept Obstet Gynecol* 2023;12:2600-4.