Medico Research Chronicles
ISSN NO. 2394-3971
DOI No. 10.26838/MEDRECH.2024.11.6.741
Contents available at www.medrech.com

Colposcopic Findings of Cervix in Visual Inspection of the Cervix After Acetic Acid Application (VIA) Positive Cases Attending Colposcopic Clinic at Chittagong Medical College Hospital (CMCH)

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ARTICLE INFO | **ABSTRACT** | **ORIGINAL RESEARCH ARTICLE**

Article History
Received: October 2024
Accepted: November 2024
Key Words:
Colposcopy, Abnormalities, Car-cervix, VIA, Acetic Acid.

Background: Colposcopy is an essential diagnostic tool used to evaluate abnormalities of the cervix, particularly after a positive Visual Inspection with Acetic Acid (VIA) areas of dysplasia or neoplasia, which may appear white (acetowhite) after application. **Objectives:** The aim of the study was to evaluate the role of VIA technique in the early detection of carcinoma. **Methods:** Diluted acetic acid (3-5%) was applied to the cervix during routine gynaecological examination. Women with positive result were referred for colposcopy. Women with both positive and negative results found in colposcopic examination underwent colposcopy guided biopsy. Then both sensitivity and specificity of colposcopy was determined and the result was compared with other studies of home and abroad. Statistical analyses of the results were be obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-24). **Results:** A prospective study was conducted from July 2007 to June 2008 on 100 women attending at the "Colposcopy Clinic" of CMCH, Chittagong. Only VIA positive cases were taken into consideration of the study. Colposcopy evaluated 62 cases as CIN (CINI 31 %, CIN II-17%, CIN-III 14%) and 3.0% as invasive lesions. Biopsy evaluated 36% as CIN (CIN 1- 17%, CIN- II 10%, CIN-III 9%) and 1% as invasive lesions. The sensitivity and specificity of colposcopy were 81.08% and 44.44%

respectively. **Conclusion:** VIA is an important method in low resource settings and it is simple and easy to perform. Colposcopy is an indispensable procedure in the evaluation of unhealthy cervix though it requires considerable training and experience. It has got high sensitivity and negative predictive value.

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2024, www.medrech.com

INTRODUCTION

Cervical cancer is the second most frequent type of cancer in women worldwide and the most common in almost all emerging nations. [1] Cervical cancer was the third most frequent malignancy in women worldwide ten years ago. Nonetheless, it was the most prevalent malignancy in women in 42 low-resource nations. [2] New avenues for primary and secondary prevention have been made possible by the realization that the principal cause of cervical cancer is a chronic infection with carcinogenic human papillomavirus (HPV) types. [3] The incidence and mortality of cervical cancer can be significantly reduced by putting both preventative strategies into practice.

There are 44.78 million women in Bangladesh who are 15 years of age or older and at risk of having cervical cancer. According to current estimates, 12931 women receive a cervical cancer diagnosis each year, and 6561 of them pass away as a result of the illness. In Bangladesh, cervical cancer is the most common cancer among women as well as the most common cancer among women aged 15 to 44. There are very few statistics on the prevalence of HPV in Bangladesh's general population. But in Southern Asia, which includes Bangladesh, it is estimated that 6.6% of women in the general population have a cervical HPV infection at any given time, and HPVs 16 or 18 are responsible for 75.1% of invasive cervical malignancies. [4]

The government embraced cervical cancer screening using the visual examination of the cervix with acetic acid (VIA) method, as recommended by the World Health Organization (WHO) for resource-constrained nations. [5] The screening program was expanded to include all districts and chosen Upazillas. The screening program has been carried out by increasing the capacity of service providers at medical college hospitals, district hospitals, mother and child care welfare centers, selected Upazilla health complexes, and various institutes. According to the WHO, Bangladesh's screening guideline suggests screening women above the age of 30 with screen coverage ranging from 30 to 60 every five years. According to Health Bulletin 2019, only 7.5% of women aged 30-49 had ever received a cervical screening. According to the "World Health Organization - Cervical Cancer Country Profiles, 2021," the screening rate for cervical cancer in the last five years is 5%, and the screening rate overall is 7%. [6]

The World Health Organization estimates that approximately 604000 women worldwide are diagnosed with cervical cancer each year, with 340000 dying from the disease. [7] Cervical cancer is regarded as the third most prevalent cause of cancer in women worldwide, and the second most common type of cancer among women in developing countries. [8] In the majority of developing countries, cervical cancer is the leading cause of cancer-related death among women. Worldwide successful cervical cancer prevention is based on as screening programme. However, a generalized screening programme is difficult to be implemented in developing countries where resources are limited.

Cervical cancer is a major public health issue for adult women in many poor nations. [9] Although structured and high-level opportunistic cytology screening has resulted

in a significant reduction in the cervical cancer burden in industrialized nations, incidence rates in poor countries remain high due to a lack of efficient screening programs. A variety of cervical cancer screening methods are touted as alternatives to cytology, including automated pap screening, visual inspection with acetic acid (VIA), human papillomavirus testing, and, most recently, the polar probe. Among them, visual inspection with acetic acid (VIA) is a potential screening test that is appropriate for low-resource settings because it is inexpensive, requires only locally available supplies, and can be performed competently by physicians, nurses, or even paramedics with proper training. [10]

METHODOLOGY

This prospective study was carried out in the Department of Obstetrics & Gynaecology, Chittagong Medical College Hospital, Chittagong, Bangladesh, during July 2007 to June 2008. This study was carried out to determine the role of colposcopy in VIA positive cases in the diagnosis of cervical intraepithelial neoplasia among the women of 18-60 years. All VIA positive cases of this age group attending the "Colposcopy Clinic". In this study all VIA positive cases referred from OPD to the Colposcopy Clinic were purposively selected and 100 cases were included randomly. After taking consent and matching eligibility criteria, data were collected from patients on variables of interest using the predesigned structured questionnaire by interview, observation. Statistical analyses of the results were be obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Table-1: Age distribution of the study population (n=100).

Age (years)	n=100	%
18-25	16	16
26-35	28	28
36-45	41	41
46-55	11	11
56-60	4	4

Table-1 shows age distribution of the study population, it was observed that the age of the patients was in between 18-60 years with a mean age of 33.39 years. The highest number was 41(41%) in the age group of 36-45 years and the lowest number was 4(4%) in the age group of 55-60 years.

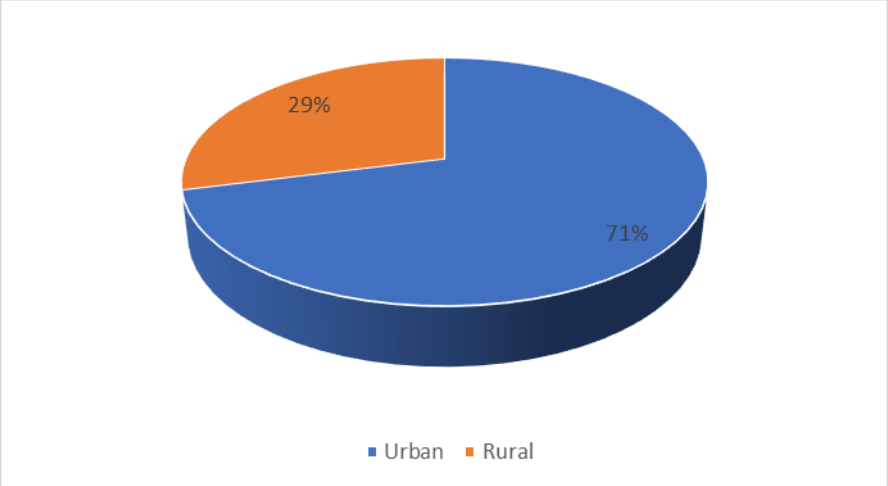

Figure 1: Pie chart of rural and urban distribution of the subjects (n=100).

Figure 1 shows the majority 71% of the patients were Urban and 29% were Rural. The people residing in the urban area were more than double than that of the rural area.

Table 2: Obstetric and Gynaecological history of the patients (n=100).

Variables	n=100	%
Age of menarche in years		
12 years	38	38%
13 years	48	48%
14 years	14	14%
Married for		
<10 years	12	12%
10-15 years	25	25%
16-20 years	32	32%
21-25 years	19	19%
26-30 years	7	7%
31-35 years	5	5%

Table-2 shows the obstetric and gynaecological history of the patients, it was observed that, according to age of menarche in years, 38% was 12 years, 48% were 13 years and 14% were 14 years respectfully. And according to married for, 25% patients were between in the age of 10-15 years, 32% patients were 16-20 years and 19% patients were 21-25 years respectfully.

Table 3: Findings regarding the risk factors of cervical cancer (n=100).

Variables	n=100	%
Use of Contraceptives (n=76)		
Barrier	14	18.4
Hormonal	45	59.2
Both	17	22.3
Age at first coitus (n=100)		
Less than 15	15	15
15-20 years	65	65
20 years and above	20	20

Table-3 shows the risk factors of cervical cancer, it was observed that, according to use of contraceptives, 14% patients had barrier, 45% patients had hormonal and 17% had both.

Table 4: Distribution of sign-symptoms of the patients (n=100).

Sign-symptoms	n=100	%
Abnormal intermenstrual bleeding	12	12
Post-coital bleeding	24	24
Excessive vaginal discharge	56	56
Backache	50	50
Dyspareunia	15	15

Table-4 shows the distribution of sign-symptoms of the patients, it was observed that, 12% patients had Abnormal intermenstrual bleeding, 24% patients had post-coital bleeding and 56% patients had Excessive vaginal discharge and 50% patients had Backache

Table 5: Distribution of Colposcopic findings (n=100).

Findings	n=100	%
Squamo-columnar junction		
Normal visualized	85	85
Not clear	15	15
Acetowhite lesion	85	85
Findings proper		
Normal	10	10
Inflammation	25	25
CIN I	31	31
CIN II	17	17
CIN III	14	14
Invasive carcinoma	03	03

Table-5 shows the distribution of colposcopic findings, it was observed that, according to squamo-columnar junction, 85% patients were normal visualized and 15% patients were not clear. And Normal, Inflammation, CIN I, CIN II, CIN III and Invasive carcinoma were 10%, 25%, 31%, 17%, 14% and 3% respectfully.

Table 6: Shows histology results of biopsy findings (n=100).

Biopsy findings	n=100	%
Normal	12	12
Inflammation	51	51
CIN I	17	17
CIN II	10	10
CIN III	09	09
Invasive carcinoma	01	01

Table-6 shows the histology results of biopsy findings, it was observed that, Normal, Inflammation, CIN I, CIN II, CIN III and Invasive carcinoma were 12%, 51%, 17%, 10%, 9% and 1% respectfully.

Table 7: Shows histology results of biopsy findings (n=100).

Colposcopy findings of all. VIA positive cases		Colposcopy directed biopsy (CDB) findings					
		Normal	Inflammation	CIN I	CIN II	CIN III	Invasive carcinoma
Colposcopy negative (35)	Normal (10)	09	01	--	--	--	--
	Inflammation (25)	01	17	06	01	00	--
Colposcopy positive (65)	CIN I (31)	02	20	07	01	01	--
	CIN II (17)	--	09	02	05	05	--
	CIN III (14)	--	04	02	02	02	--
	Invasive carcinoma (3)	--	--	--	01	01	01
	Total	12	51	17	10	09	01
				Total Biopsy positive=37			

Table-7 shows the histology results of biopsy findings, it was observed that, when the Colposcopy negative (35) and Inflammation (25) the Normal, Inflammation, CIN I, CIN II and CIN III were 1, 17, 6, 1 and 0 respectfully. On the other hand, when the Colposcopy positive (35) and CIN I (31) the Normal, Inflammation, CIN I, CIN II and CIN III were 2, 20, 7, 1 and 1 respectfully. And the total biopsy positive was 37.

Table 8: Accuracy of Colposcopy for screening by statistical analysis (n=100).

Colposcopic findings	Disease		Total
	Positive	Negative	
Positive	30	35	65
Negative	7	28	35
Total	37	63	100

Table-8 shows the accuracy of colposcopy for screening by statistical analysis, it was observed that, when the colposcopic findings were positive, 30% was positive disease and 35% was negative disease. Whereas, when the colposcopic findings were negative, 7% was positive disease and 28% was negative disease.

Table 9: Accuracy of Colposcopy for screening by statistical analysis(n=100).

Colposcopy test accuracy	Result
True positive (TP)	30%
False positive (FP)	35%
True negative (TN)	28%
False negative (FN)	07%
Sensitivity	81.08%
Specificity	44.44%
Positive predictive value	46.14%

Table-9 shows the accuracy of Colposcopy for screening by statistical analysis, it was observed that, True positive (TP), False positive (FP), True negative (TN), False negative (FN), Sensitivity, Specificity and Positive predictive value were 30%, 35%, 28%, 7%, 81.08%, 44.44% and 46.14% respectfully.

DISCUSSION

This prospective observational study was carried out to determine the role of Colposcopy in VIA positive cases in the diagnosis of cervical intraepithelial neoplasia among the women of 18-60 years. All VIA positive cases of this age group attending the "Colposcopy Clinic" at CMCH from July 2007 to June 2008 were considered. In this study all VIA positive cases referred from OPD to the Colposcopy Clinic were purposively selected and 100 cases were included randomly.

Invasive cervical cancers are usually preceded by a long phase of pre-invasive disease characterized microscopically as a spectrum of events progressing from cellular atypia to various grades of dysplasia or cervical intraepithelial neoplasia (CIN) before progression to invasive carcinoma. The purpose of this study is to determine the role of colposcopy in VIA positive cases for the diagnosis of cervical intraepithelial neoplasia, so that those screening tools can be used effectively in the diagnosis of CIN and thereby can prevent the disease progression to invasive carcinoma.

The peak age group (41%) of VIA positive cases was within 36-45 years with a mean age of 33.39 years. The mean age of our study corresponds with that of Jahan Y (35.674 years) and Sankarnarayan et al (38.9±7 years). [11] Almost two-thirds of the cases were within 26-45 years. As the age

advanced, the percent of age group reduced according to this study. In similar studies Syeeda S. (2003) and Jahan Y found about 32% and 35% cases in 36-45 age group & 38.46% and 33% cases in 26-35 age group. [12] Tofazzal found highest incidence in 40 to 50 years age group closely followed by 30 to 40 years, where the age of incidence of occurrence of invasive cervical cancer was 40 to 45 years. [7] Syeeda's and Jahan's findings correspond well with this study & it is indicative that CIN is more prone to occur in sexually active women. WHO also suggested the priority age group 35-45 years for the screening of CIN.

More than half of the respondents had 3-4 children indicating multiparty as a related risk for CIN of the cervix. This observation correlates with the study of Schiffman MH et al, Clemmesen J and Rotkin ID. Studies in our countries by Syeeda and Ishrat also support the influence of multiparity in the development of cervical cancer. In the present study, highest percentage had experienced menarche at the age of 13 years. Among the participants most patients had the marital life of 10-25 years.

The rate of hormonal contraceptives was 59.2%, which is higher than the national contraceptive use rate i.e. 53.8%. [13] This justifies the role of hormone for the development of cervical malignancy. This study supports the work of Murthy NS et al. Recent studies suggest that long duration use of oral contraceptives increases the risk of cervical cancer in HPV positive women. Regarding age of first coitus 65% had experienced coitus within 15-20 years of age which corresponds with the study of Syeeda S and Rotkin ID. Of the 100 cases, the most common presentation was excessive vaginal discharge. Other features include backache, post coital bleeding, dyspareunia and abnormal intermenstrual bleeding. All these were non-specific, which necessitated the need of screening tests for CIN.

Out of 100 cases, all had VIA positive acetowhite punctations. But colposcopy revealed that 65.0% had CIN and invasive lesions, while 35.0% had either normal or inflammatory lesions. Colposcopy directed punch biopsy revealed that 37.0% cases had positive lesions like CIN or invasive carcinoma and 63.0% had neither CIN nor invasive lesions. As all of the cases were VIA positive, therefore, the sensitivity and specificity of VIA could not be calculated exactly. But evidence of CIN and invasive lesions in colposcopy directed cervical biopsy among the VIA positive patients strongly suggest the need of VIA as an essential screening test. On the other hand, both the colposcopy positive and the colposcopy negative patients were subjected to colposcopy directed biopsy. Considering CDB as a gold-standard, the sensitivity and specificity of colposcopy can be determined.

Within 100 VIA positive cases, 65 cases (65%) had positive findings by colposcopy and among those, 30 cases were found to have positive biopsy findings (true positive) and 35 cases were false positive in VIA test when compared with CDB. Of the 35 colposcopy negative cases 7 patients were found to have CIN or cervical biopsy (false negative) and rest of them i.e. 28 cases had no evidence of CIN or malignancy (true negative). In our study sensitivity and specificity of colposcopic examination was found 81.08% and 44.44% respectively. This result is near to the result of pete I get in terms of sensitivity (87%) but in terms of specificity out study reveals colposcopy as more specific a test than their findings (15%). Similar study in our country by Jahan I revealed sensitivity and specificity of colposcopic examination was 89.6% and 54.5% respectively. Belinson JL et al reported high sensitivity (81%) and specificity (77%) of colposcopy examination but those figures are for detection of CIN II or more invasive lesions. Hilgarth and Menton in their study also found high sensitivity of

colposcopy and strongly advocate the use of colposcopy for early diagnosis of CIN including sub clinical lesions specially in HPV infected patients. [14]

Limitations of the study

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

CONCLUSION

The study concludes that the VIA and colposcopy are the important methods of diagnostic accuracy in the evaluation of cervical pre-malignancy. VIA is an important method in low resource settings and it is simple and easy to perform. VIA may be used as a tool for screening in underdeveloped countries and may be associated with a referral procedure for further methods like colposcopy and biopsy. Colposcopy is an indispensable procedure in the evaluation of unhealthy cervix though it requires considerable training and experience. Cervical cancer is a priority concern for the WHO program on cancer control. WHO recommends and specially emphasize on early detection policies to programs with a systematic approach, are well integrated into the existing health system and accounts the social, cultural and economic context. In Bangladesh, routine use of VIA and colposcopy in all clinically suspicious cases will play significant role in the detection of early cervical cancer and can prevent their progression to invasive carcinoma.

RECOMMENDATION

This study can serve as a pilot to much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

ACKNOWLEDGEMENTS

The wide range of disciplines involved in colposcopic findings of cervix in VIA positive cases attending colposcopic clinic at CMCH research means that editors need much assistance from references in the evaluation of papers submitted for publication. I would also like to be grateful to my colleagues and family who supported me and offered deep insight into the study.

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