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RESEARCH PAPER

Colposcopic Findings for Detecting Pre-invasive Lesion of Cervix Among Visually Inspected Acetic Acid Positive Cases

Farjana Islam[1], Chowdhury Shamima Sultana[2]

[1]Department of Medical Oncology, National Institute of Cancer Research & Hospital (NICRH), Dhaka, Bangladesh; [2]Department of Gyneacological Oncology, National Institute of Cancer Research & Hospital, Dhaka, Bangladesh

Abstract

Background: Cervical cancer-a preventable disease, is the second most commonly diagnosed cancer among women of developing countries. Paps smear is the gold standard screening method worldwide. But a low-cost test, visual inspection of cervix with acetic acid (VIA) has been emerged as an alternative for use in low-resource settings. VIA is simple and easy to perform by auxiliary health professionals. Colposcopy is an essential procedure in the evaluation of screen positive cervix though it requires considerable training and experience.

Objective: The objective of this study was to evaluate the VIA positive cases by colposcopy, colposcopy guided biopsy and histopathological examination.

Methods: This was a cross sectional observational study conducted among 100 VIA positive cases attended at GOPD of Dhaka Medical College Hospital from July 2014 to December 2014. Colposcopy was performed in all VIA positive cases. Subsequent biopsy and histopathological examinations were done for those with colposcopic abnormal findings.

Results: The mean age of the study population was 37.9±9.3 years. Among VIA positive cases 66.0% had complaints of whitish vaginal discharge. Among the study population, colposcopically 46.0% had healthy cervix (normal) and 54.0% had abnormal findings. Colposcopy guided biopsy was taken from those with abnormal findings. Histopathological findings were normal in 38.9% cases, chronic cervicitis in 20.37% cases, squamous cell metaplasia in 3.7% cases, CIN I in 16.7%, CIN II in11.11%, CIN III in 5.6% and 3.7% cases were carcinoma cervix. True positive value was 20, false positive value 34 and positive predictive value of colposcopy was 37.03%.

Conclusion: This study concluded that VIA is effective in detection of CIN and invasive carcinoma of cervix. It also suggests the role of colposcopy in the evaluation of CIN and other cervical diseases in screen positive cases. VIA can be used as a screening tool in low and middle income countries like Bangladesh, not only in rural areas and small health centres, but also in hospitals, cancer institutes, and other health facilities with better resources.

Keywords: Colposcopy, Pre-invasive lesion, Visual inspection with acetic acid (VIA), Carcinoma in situ

Introduction

Cervical cancer is a public health problem worldwide. It is the 4th most frequently diagnosed cancer in women worldwide, with an estimated 570,000 new cases in 2018. It is also the 4th leading cause of cancer death, with an estimated 311,000 deaths in 2018. It is the 2nd most commonly diagnosed cancer and leading cause of cancer death among females in less developed countries.[1] Cervical cancer is the 2nd leading cause of female cancer in incidence and 3rd leading cause of female cancer deaths among Bangladeshi women with an estimated 8,068 new cases and 5,214 deaths in 2018.[2]

Cervical cancer has a long preinvasive state. Therefore, screening programmes which detect preinvasive cellular changes of the cervix potentially can prevent the occurrence of invasive cervical cancer through detection and treatment of preinvasive disease.[3,4] Worldwide, various screening guidelines have been developed for the early diagnosis and treatment of precancerous lesions of the cervix. In developed countries, incidence and mortality of cervical cancer

***Correspondence:** Farjana Islam, Department of Medical Oncology, National Institute of Cancer Research & Hospital (NICRH), Dhaka, Bangladesh*

e-mail: zabirzaira@gmail.com

ORCID: 0000-0002-0720-7069

has been lowered by human papillomavirus vaccine and effective population-based screening programme with Pap smear and or HPV DNA testing.[5] Pap smear is the gold standard screening method worldwide. But the visual inspection with acetic acid (VIA) has been emerged as an alternative for use in low-resource settings. Several studies showed the advantages of VIA. It is cheap , simple, highly sensitive and provide instant results.[6-8] It needs minimum laboratory equipment and reagents, and auxiliary health professionals can be trained to perform it.[9] On exposure to 3-5% acetic acid solution, abnormal cells of the cervical transformation zone epithelium temporarily turn aceto-white.[10] Women with a positive VIA can then be triaged directly for colposcopy to establish a conclusive tissue diagnosis and to determine appropriate treatment of pre-invasive disease.[11]

Colposcopy is the examination of the epithelia of the cervix, lower genital tract and anogenital area using magnified illumination after the application of specific solutions to detect abnormal appearances consistent with neoplasia, or to confirm normality. The procedure is able to identify intraepithelial cervical lesions, determine their localization and characteristics and guide biopsy for diagnostic confirmation usually in screen positive women.[12]

However, most of the guidelines may not be suitable for the developing countries like Bangladesh for various reasons like no population-based screening programme, facility for management of positive cases and scarcity of trained manpower. It has been estimated that only 5% of the women in developing countries have been screened for cervical dysplasia compared with about 40% to 50% of women in developed countries.[13]

Government of Bangladesh with the support of UNFPA has taken initiative to develop a cervical cancer screening programme. VIA performed by field level workers was considered to be a feasible method for screening cervical cancer in the present socio-economic context. This programme also provides referral linkage and treatment. Other two screening tests, cervical cytology and HPV identification are being used sporadically.

The target group for screening are encouraged to attend local Upazilla Health and Family Welfare Centre, Maternal and Child Welfare Centre or the District Hospital for VIA test. The screened positive women from field level are referred to centers where facilities for colposcopy, histopathology and management of preinvasive disease are available.

This study was conducted in Dhaka Medical College Hospital (DMCH); in Gynaecology outpatient department of Obstetrics and Gynaecology department (GOPD). DMCH is a tertiary hospital and one of the referral centers for VIA positive cases. The subjects then underwent colposcopic examination to detect preinvasive and microinvasive lesion of cervix and thus evaluating the efficacy of VIA test as a simple and cheap screening method. This study was aimed to evaluate the VIA positive cases by colposcopy, colposcopy guided biopsy and subsequent histopathological examination.

Materials and Methods

This cross sectional study was conducted from July 2014 to December 2014 in the GOPD of Dhaka Medical College Hospital. The study population constituted all VIA positive cases between 18 to 60 years who attended at GOPD of DMCH. Data were collected after approval from Institutional Review Board (IRB) of the Dhaka Medical College.

Patient with current pregnancy, menstruating women, obvious growths in cervix suggestive of malignancy, hysterectomized patient, patient with vaginal stenosis were excluded from the study.

The study was carried out among 100 VIA positive women selected consecutively in GOPD of DMCH. Purposive sampling technique was employed to include the required number of patients. After explaining the procedure and obtaining informed written consent, colposcopic examination of cervix was performed in all VIA positive cases. Colposcopy was performed in the dorsal lithotomy position with a drape covering the patient's legs. The cervix was visualized using a standard speculum. The examination involved the application of three standard solutions to the cervix. These were normal saline, 3-5% acetic acid and lugols iodine. Normal saline applied to remove mucus, debris and to moisturize the cervix. Then green filter examination of the cervix was done that enhances the angioarchitecture. Acetic acid was applied to cervix

using soaked swabs for one minute. The abnormal colposcopic findings were acetowhite epithelium, abnormal vascular patterns and negative schiller's iodine test.

The VIA positive women were divided in colposcopy positive and negative group. Colposcopy guided punch biopsy was taken from the acetowhite areas and iodine negative area and specimen was sent for histopathological examination in the department of pathology, DMCH. Colposcopy guided biopsy helps to detect pre-invasive lesion of cervix and other cervical pathology. Pretested data collection sheet was used as data collection instrument or prescribed questionnaire. Clinical history and physical examination were recorded in prescribed questionnaire.

All the data were entered into computer database, organized and analyzed using Statistical Package for the Social Sciences (SPSS) software. Categorical data were presented as frequency and percentage and the continuous variables were expressed as Mean and Standard Deviation. Data and results were presented by tables and figures. Following formula was used to obtain the positive predictive value (PPV). PPV = {True positive (TP) ×100} ÷ {True positive (TP) + False positive (FP)}

Results

A total of 100 VIA positive cases were subjected to colposcopy. Subsequent biopsy and histopathology were done for those with colposcopic abnormal findings. The mean (±SD) of the age of study population was 37.9±9.3 years ranging from 18 to 60 years. Majority of the participants (45.0%) belonged to 35 - 44 years age group.

Regarding socioeconomic status, 34.0% of the study population were from lower middle economic status and 30.0% were poor. Regarding their occupational status 70.0% participants were house wives and others were employed in different government and non-government organizations. As the age of first coitus is concerned, about 48.0% had first coitus at the age between 14-18 years and 28.0% had their first sexual experience before 14 years of age. Regarding parity, 45% were para 5 or more and 38.0% having para 3 to 4. About 57.0% came from urban areas. About 22.0% of the participant's husband were rickshaw puller and 20.0% were farmer (table I).

Table I: Socio-demographic characteristics of VIA positive cases

Characteristics	No. of patients (n=100)	Percentage
Age in years		
18-24	5	5
25-34	30	30
35-44	45	45
45-54	16	16
>54	4	4
Mean±SD	37.99±9.32	
Parity		
0	1	1
1-2	16	16
3-4	38	38
>4	45	45
Age at first coitus		
≤14 years	28	28
14-18 years	48	48
>18 years	24	24
Socio-economic condition		
Poor (<5000 Taka)	30	30
Lower middle class (5000-10000 Taka)	34	34
Middle class (10000-25000 Taka)	20	20
Upper middle class (25000-50000 Taka)	12	12
Rich (>50000 Taka)	4	4
Occupation		
Unemployed/ Housewife	70	70
Garments /Industrial Workers	25	25
Secretarial Jobs	5	5
Husband's Occupation		
Farmer	20	20
Businessman	16	16
Govt. Service	5	5
Private Job	12	12
Rickshaw Puller	22	22
Day labor	18	18
Live in abroad	7	7
Residence		
Urban	57	57
Rural	43	43

Contraceptive prevalence among the VIA positive cases showed that 36% never used any method. About 21.0% of the patients were OCP user (figure 1). Most of the VIA positive women (66.0%) complained of whitish vaginal discharge and 37.0% complained of dyspareunia (table II).

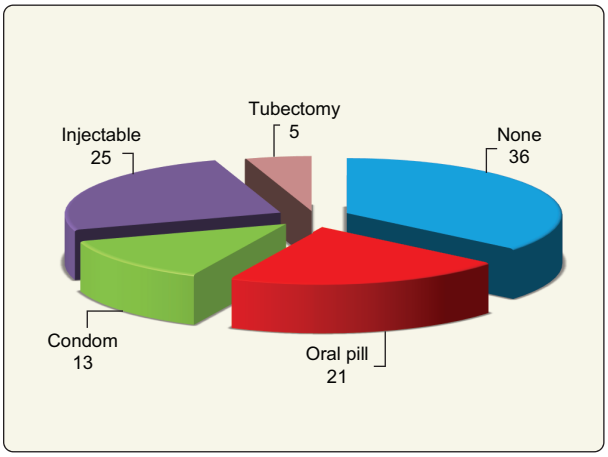

Figure 1: Use of contraceptive methods among the study subjects: (n=100)

Table II: Distributions of subjects according to their symptoms

Symptoms	Number (n=100)	Percentage
Whitish vaginal discharge	66	66
Dyspareunia	37	37
Post coital bleeding	25	25
Blood-stained vaginal discharge	21	21
Post-menopausal bleeding	20	20
Foul smelling vaginal discharge	9	9
Itching in and around the vulva	5	5

Total will not correspond to 100% because of multiple complications were present in some patients.

About 80.0% of VIA positive women had apparently healthy cervix on per speculum examination and 86.0% had apparently healthy cervix on bimanual examination (table III).

Table III: Distribution of Vaginal examination findings of the study subjects

Findings of cervix	Number (n=100)	Percentage
Speculum Findings		
Apparently healthy cervix	80	80
Cervical Erosion	16	16
Cervical Nodularity	2	2
Cervical Ulceration	2	2
Bimanual findings		
Normal cervix	86	86
Abnormal cervix	14	14

Forty six percent VIA positive cases were found to be normal with Colposcopy examination. Among the colposcopy positive cases (54%), 19% had CIN and 1% had invasive carcinoma (Table IV).

Table IV: Distributions of colposcopic findings among VIA positive cases

Colposcopic findings	Number (n=100)	Percentage
Normal	46	46
Abnormal	54	54
Punctation	23	23
Mosaic	30	30
Leukoplakia	3	3
Hairpin like vascularity	2	2
CIN I	10	10
CIN II	7	7
CIN III	2	2
Invasive carcinoma	1	1

Total will not correspond to100% because of multiple complications were present in some patients

Final diagnosis made by histopathological examination of colposcopy guided biopsy specimen of 54 cases revealed normal in 38.89%, chronic cervicitis in 20.37%, chronic cervicitis with squamous metaplasia in 3.7%, CIN I in 16.67%, CIN II in 11.11%, CIN III in 5.56% and invasive carcinoma in 3.7% cases (table V and table VI).

Table V: Distribution of subject according to colposcopy directed biopsy and histopathology (n=54)

Colposcopy directed biopsy	Number (n=54)	Percentage
Normal findings	21	38.89
Chronic cervicitis	11	20.37
Chronic cervicitis with squamous metaplasia	2	3.7
CIN I	9	16.67
CIN II	6	11.11
CIN III	3	5.56
Invasive carcinoma	2	3.7

Table VI: Comparison between colposcopic findings and colposcopy directed biopsy findings of CIN and Invasive cancer

Diagnosis	Colposcopic findings	Biopsy findings
CIN I	10	9
CIN II	7	6
CIN III	2	3
Invasive carcinoma	1	2

True positive value was 20, false positive value 34 and positive predictive value of colposcopy was 37.03% (table VII).

Table VII: True positive, False positive and Positive predictive value of colposcopy

Test value	Colposcopy
True positive (TP)	20
False positive (FP)	34
Positive predictive value (PPV)	37.03%

Discussions

Invasive cervical cancers are usually preceded by a long phase of pre-invasive disease. It is a spectrum of events progressing from cellular atypia to various grades of CIN before progression to invasive carcinoma. This cross sectional study was carried out to determine the role of Colposcopy in VIA positive cases in the diagnosis of CIN among the women of 18-60 years.

The screening for CIN is usually carried out at the age of 30 years or above in Bangladesh. But we included younger patients as their sexual activity started at an earlier age (<20 years). The peak age group was 35-44 years (45% cases). About 30% were within 25-34 years of age. Syeeda found in her study, about 32% in 36-45 years and 38.46% in the years 26-35 years.[14] Previous studies agree well with this study that CIN is more prone to sexually active women.

The occupational status revealed that housewives (70%) were predominantly affected. Their husbands were predominantly rickshaw-puller (22%). Socioeconomic status had always been playing an important role in genesis of dysplasia. In our study, 34% of the VIA positive women's monthly family income was 5,000 to 10,000 takas. Regarding the age of first coitus, about 48% had their first coitus at the age between 14-18 years. Yusuf N et al observed that 46 % had first coitus between 12 to 15 years and 40 % had experienced first coitus between 16 to 20 years which are almost identical with this study.[15] About 45% of the women had more than 4 children. The early age at marriage, early childbirth at young age and repeated pregnancies contribute to the risk of cervical cancer.

Most of the women attending the VIA test had the complaints of whitish vaginal discharge (76%) and 7% of them had no symptoms. Out of 100 cases 21% had history of taking oral pill, 13% used condom, 25% used injectable and 5% had history of tubectomy. The contraceptive use rate was 63% which is almost compatible to the national contraceptive use rate (62% in 2014).[16]

Among the 100 VIA positive cases 46% were normal in colposcopy while 54% showed some sorts of abnormal findings. Among those with abnormal colposcopic findings CIN I in 10%, CIN II in 7%, CIN III in 2% and invasive carcinoma found in 1% of cases. In this study, among 100 cases colposcopy guided biopsy was taken in 54 cases. Of them, 38.89% were normal, 20.37% had chronic cervicitis, 3.7% had squamous cell metaplasia, 16.67% had CIN I, 11.11% had CIN II, 5.56% had CIN III and 3.7% had carcinoma cervix. Boicea et al. found 1.6% cases were normal histologically, 10.6% cases CIN I, 22.4% cases CIN II, 56.3% cases CIN III, 2.8% cases carcinoma in situ and 6.1% cases had micro-invasive carcinoma.[17] Another study showed 48.42% VIA positive cases were abnormal on colposcopic evaluation. Of them 33% were negative on biopsy, CIN-I, CINII and CIN-III were picked up in 13.55%, 7.8% and 2.33% patients respectively and preclinical invasive carcinoma were in 7.09% cases.[15]

The colposcopic positive cases (54) were categorized in six different groups according to their biopsy report. They were chronic cervicitis, chronic cervicitis with squamous cell metaplasia, CIN I, CIN II, CIN III and carcinoma cervix. Among them 20 were biopsy positive and remaining 34 were negative. True positive value was found 20 and false positive value was found 34. Therefore, positive predictive value was 37.03%. Ebana B found positive predictive value as 32.10% in her study (Dissertation submitted to BCPS, 2010). The findings of current study indicate that a large number of inflammatory and metaplastic lesions are responsible for a large number of false positive results.

Conclusion

VIA is the effective screening test in detection of preinvasive cervical lesions and invasive carcinoma of cervix. There is a tremendous role of colposcopy in the evaluation of CIN and cervical carcinoma in VIA positive women. The time has come to integrate VIA based low cost, ease of implementation, potentially sustainable means of screening programme at the primary care level of health services for the reduction of burden of cervical cancer in Bangladesh.

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