

# Colposcopic Evaluation of Visual Inspection with Acetic Acid Positive Cases of Unhealthy Cervix

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## Summary:

*Cervical cancer is the commonest form of cancer in women in virtually all developing countries<sup>1</sup>. It is the third most common cancer among women worldwide<sup>2</sup>. Almost 80% of cervical cancer occurs in developing countries. In developed nations, the figure for invasive cervical cancer are much lower due to adaptation of different screening tests<sup>1</sup>. All sexually active women are at risk of acquiring a Human Papilloma Virus (HPV) infection which may lead to cervical cancer in the future<sup>3</sup>. Cervical cancer is a preventable disease as the different screening, diagnostic and therapeutic procedures are effective. The screening procedures are VIA (Visual inspection of cervix with acetic acid), Pap's smear and HPV DNA test. Colposcopy is the triage in screening, taking colposcopy directed biopsy as well as treatment of CIN such as cold coagulation, cryotherapy, and LEEP (Loop electro-surgical excision procedure)<sup>4</sup>.*

*Objective: To study the role of Colposcopy in the evaluation VIA positive cases of unhealthy cervix, to localize the lesions to obtain the biopsies from the selected areas and detection of precancerous lesion of cervix for early management.*

*Materials and Methods: This was a prospective observational study done among 306 married women aged 18-65 years who had clinically unhealthy cervix attending the VIA and colposcopy clinic in Department of Obstetrics and Gynaecology of Sir Salimullah Medical College and*

*Mitford Hospital from January 2015 to December 2016. All the patients were subjected to VIA test. Colposcopic evaluation done in VIA positive cases and the findings were noted. Colposcopy directed biopsy was taken from colposcopically suspected areas.*

*Results: Out of 306 cases, 63 women had positive VIA tests and 233 women had negative VIA tests. Colposcopic evaluation were undertaken among 63 VIA positive cases. Colposcopy directed punch biopsy revealed that 28 (60.32%) cases had positive lesions like CIN or invasive carcinoma and 25 (39.68%) had neither CIN or invasive lesions. Among positive lesions about 30.16% had CIN I, 1.59 % had CIN II, 0% had CIN III and 28.57% had invasive carcinoma. In this study sensitivity and specificity of colposcopy examination of VIA positive cases were found 94.74% and 56% respectively.*

*Conclusion: It is evident that colposcopy plays a very important role in the evaluation of VIA positive cases of unhealthy cervix. So that early diagnosis and treatment of preinvasive and early invasive carcinoma of cervix is possible. So wide use of colposcopy in screening program of Bangladesh specially in the VIA positive cases can reduce the many young women's morbidity and mortality.*

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## Introduction:

A colposcope is a low-power, stereoscopic, binocular field microscope with a powerful light source used for magnified visual examination of the uterine cervix

to help in the diagnosis of preinvasive and early invasive carcinoma of cervix. Modern colposcope usually permits adjustable magnification commonly 6x to 40X<sup>4</sup>.

Cervical cancer is the fourth most common cancer in the women world wide and is entirely attributable to infection with the Human Papilloma Virus (HPV)<sup>2</sup>. It is the principal cancer of women in most developing countries, where 80% of cases occur<sup>5</sup>. Every year, 17,686 women in Bangladesh are diagnosed with cervical cancer and 10,364 women die from the disease<sup>6</sup>. Hospital based data revealed that cervical cancer constitutes 22-29% of female cancer in Bangladesh<sup>4</sup>. There are estimated 450,000 new cases worldwide with about 300,000 deaths each year<sup>7</sup>. Of the new cases detected 86% occur in developing countries and 14% in developed countries<sup>5</sup>. In developed nation, the figures

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for invasive cervical cancer are much lower due to adaptation of different screening tests<sup>8</sup>.

Invasive cervical cancers are preceded by a long phase of pre-invasive disease, collectively referred to as Cervical intraepithelial neoplasia (CIN). CIN may be categorized into grades 1, 2 and 3 depending upon the proportion of the thickness of the epithelium having mature and undifferentiated cells<sup>4</sup>. The precancerous stage is quite long and ranges from 7 to 20 years which enables early diagnosis and treatment at this stage<sup>4</sup>. Persistent infection with one or more of the oncogenic subtypes of human papilloma virus (HPV) is necessary cause for cervical neoplasia<sup>4</sup>. Studies have shown that HPV is responsible for more than 99.7% of the cases of invasive cervical cancer worldwide, and it is related to 80% of precancerous changes in the cervix<sup>9</sup>. The risk factor for high prevalence of cervical cancer in Bangladesh is related to early marriage, early starting of sexual activities, multiparity, STDs, low socioeconomic condition. Therefore, understanding of etiological factors are important for the successful prevention of the disease<sup>1</sup>. VIA of cervix after 3-5% acetic acid application is a simple and easy to learn method of cervical cancer screening. On exposure to this solution, abnormal cells of the cervical epithelium temporarily turn white and reveal acetowhite epithelium of the abnormal transformation zone<sup>10</sup>.

The term "Unhealthy cervix" encompasses a wide spectrum of conditions. The naked eye evaluation of the unhealthy cervix is deceptive sometimes and it often happens that intraepithelial precancerous conditions



**Fig.-1:** Colposcopy shows Circumferential, mild to dense acetowhite lesion with fine mosaic (arrow)

are considered as simple cases of erosion due to inflammation<sup>11</sup>.

Rates of cervical cancer are estimated to be at least four fold higher in low resource countries<sup>2</sup>. The aim of study the role of colposcopy in the evaluation of VIA positive cases of unhealthy cervix is to localize the lesions and to obtain biopsies from selected areas and detection of precancerous lesion of cervix for early management.

#### Materials and Methods:

This was a prospective observational study done among married women who had clinically unhealthy looking cervix attending the VIA and colposcopy clinic of the Department of Obstetrics and Gynecology of Sir Salimullah Medical College and Mitford Hospital from January 2015 to December 2016. A total number of 306 women were included in this study having age range between 18-65 years. All women were counseled. Then informed written consent were taken for VIA, Colposcopy and colposcopy directed biopsy. Among them 63 women had positive VIA test. Colposcopy and Colposcopy directed punch biopsy were taken from the abnormal colposcopic appearance of the VIA positive cases and specimen sent for histopathological examination. 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 colposcopic examination involves the application of three standard solutions to the cervix: Normal saline, 3-5% acetic acid solution and lugol iodine. Normal saline apply to remove obscuring mucus and debris, to moisture the cervix. Green filter examination of the cervix enhances the angioarchitecture. Acetic acid apply to cervix using soaked swabs. The abnormal colposcopic findings are acetowhite epithelium, abnormal vascular patterns and negative schiller's iodine test.

#### Result:

Out of 306 patients 134 (43.79%) were in the age group of 30-39 years (Table I). 294 (96.08%) patients were house wife. 96 (31.37%) of their husband's occupation were business and 74 (24.18%) were service holder. 211(68.95%) of the participants had yearly family income in between 10,000-20,000 (Table II).

Regarding the risk factors 65 (21.24%) patients were married before the age of 15 years and 221 (72.22%) were married between the age of 15-20 years. Nine (2.94%) patients had their first child before the age of 15 years and 218 (71.24%) patients had their first child

between 15-20 years. 137(44.77%) of them had 1-2 children and 118 (38.56%) women had 3-4 children. (Table III).

Colposcopic examination revealed that out of 63 VIA positive patients, 11(17.46%) had normal colposcopic findings. Colposcopy showed inflammation of cervix in 14 (22.22%) cases, CIN I in 24(38.1%) cases, CIN II in 10 (15.87%) cases, CIN III in 2 (3.17%) cases and invasive cervical carcinoma in 11 (17.46%) cases (Table V).

Later on histopathology of biopsy (63) showed normal findings in 2(3.17%) cases, inflammation in 23(36.51%) cases, CIN I in 19(30.16%) cases, CIN II in 1(1.59%) case, CIN III in 0(0%) case and invasive squamous cell carcinoma in 18 (28.57%) cases (Table VI).

**Table-I***Age distribution of the patients of unhealthy cervix*

Age in years(n= 306)	Frequency	Percentage
<20	2	0.65
20-29	62	20.26
30-39	134	43.79
40-49	87	28.43
50-59	13	4.25
60-69	8	2.61

**Table-II***Distribution of the patients of unhealthy cervix by socio-demographic characteristics*

Variables	Frequency	Percentage
<b>Patient's Occupation</b>		
House wife	294	96.08
Service	12	3.92
<b>Husband's Occupation</b>		
Service holder	74	24.18
Business	96	31.37
Day laborer	38	12.42
Driver	28	9.15
Agriculture	20	6.54
Unemployed	17	5.56
Abroad	18	5.88
Died	15	4.9
<b>Yearly Family Income(Taka)</b>		
<10,000	39	12.75
10,000-20,000	211	68.95
21,000-30,000	30	9.8
31,000-40,000	6	1.96
>41,000	20	6.54

**Table-III***Regarding risk factors of Cervical Cancer*

Variables	Frequency	Percentage
<b>Age of marriage</b>		
<15	65	21.24
15-20	221	72.22
>20	20	6.54
<b>Age of first pregnancy</b>		
<15	9	2.94
15-20	218	71.24
>20	72	23.53
<b>Number of parity</b>		
No	7	2.29
1-2	137	44.77
3-4	118	38.56
>4	44	14.38
Number of Abortion	57	18.63
Number of MR	69	22.55

**Table-IV***Screening by VIA*

	Total	Percentage
VIA positive	63	20.59
VIA negative	243	79.41

**Table-V***Distribution of Colposcopic findings of VIA positive cases of unhealthy cervix*

Findings	Number (n=63)	Percent
SCJ visualize	63	100
SCJ not visualize	0	0
AW lesion present	63	100
Normal	11	17.46
Inflammation	14	22.22
Colposcopy negative	25	39.68
CIN I	24	38.1
CIN II	10	15.87
CIN III	2	3.17
Invasive Cervical carcinoma	11	17.46
Colposcopy positive	47	74.6

**Table-VI**

<i>Histopathology results of biopsy specimen of VIA positive cases of unhealthy cervix</i>		
Biopsy findings	Number (n=63)	Percent
Normal	2	3.17
Inflammation	23	36.51
Biopsy negative	25	39.68
CIN I	19	30.16
CIN II	1	1.59
CIN III	0	0
Invasive Carcinoma	18	28.57
Biopsy positive	38	60.32

**Table-VII**

<i>Comparative findings of Colposcopy &amp; Colposcopy directed biopsy of VIA positive cases</i>						
Colposcopy Findings of all VIA positive cases (n=63)	Colposcopy directed biopsy findings					
	Normal	Inflammation	CIN I	CIN II	CIN III	Invasive carcinoma
Colposcopy Negative (25)	2	12				2
Normal (11)						
Inflammation (14)						
Colposcopy Positive (47)						
CIN I (24)		10	14			
CIN II (10)		1	5			4
CIN III (2)				1		1
Invasive Carcinoma (11)						11
Total	2	23	19	1	0	18
		Total biopsy positive-38				

**Table-VIII**

<i>Sensitivity and Specificity of Colposcopy in detecting CIN</i>			
Colposcopic findings	Disease positive	Negative	Total
Positive	36	11	47
Negative	2	14	16
Total	38	25	63

**Table-IX***Accuracy of Colposcopy for screening by statistical analysis*

Colposcopy test accuracy	Result
True positive	36
False positive	11
True negative	14
False negative	2
Sensitivity	94.74%
Specificity	56%
Positive predictive value	76.6%
Negative predictive value	87.5%

Sensitivity and specificity Analysis: The sensitivity and specificity of colposcopy was calculated considering colposcopy directed biopsy as a gold standard<sup>1</sup>. Among the VIA positive cases 74.6 % positive in colposcopy and 60.32% positive in biopsy. The sensitivity and specificity of colposcopy were 94.72% and 56% respectively as shown in table IX.

**Discussion:**

Colposcopy, a clinical method of proven accuracy, is an excellent means of evaluating clinically unhealthy cervix<sup>8</sup>. The women in this study varied in age and parity. Out of 306 patients 134 (43.79%) were in the age group of 30-39 years. World Health Organization suggested the priority age group 35-45 years for the screening of CIN<sup>12</sup>.

294 (96.08%) patients were house wife. 96 (31.37%) patient's husband's occupation were business and 74 (24.18%) patient's husband were service holder. Socioeconomic status had always been playing an epidemiological role in genesis of dysplasia<sup>13</sup>. In our study 68.59% of the respondent's yearly family income were 10,000-20,000. Regarding the risk factors 65 (21.24%) patients were married before the age of 15 years and 221 (72.22%) were married between the age of 15-20 years which corresponds with the study of Rotkin ID<sup>14</sup>. Nine (2.94%) women had their first child before the age of 15 years and 218 (71.24%) patients had their first child between 15-20 years. About 45% of them had 1-2 children and 118 (38.56%) women had 3-4 children. indicating multiparity as a related risk for CIN of the cervix. This observation correlates with the study of Schiffman MH

et al and Rotkin ID<sup>15,14</sup>. Smith believes that poor obstetrical and postpartum care and neglect of the symptoms of a lacerated and ulcerated cervix accounts for the greater frequency of cervical cancer among the poorer classes<sup>16</sup>.

Among VIA positive cases , 25(39.68%) patients had negative colposcopic findings and 47(74.6%) patients had positive colposcopic findings, that is 24(38.1%) had CINI, 10(15.87%) had CIN II, 2(3.17%) had CINIII and 11(17.46%) had invasive carcinoma. Biopsy were done only in VIA positive cases. Biopsy showed normal findings in 2(3.17%) cases, inflammation in 23(36.51%) cases, CIN I in 19 (30.16%) cases, CIN II in 1(1.59%) cases, CIN III in 0(0%) case and invasive squamous cell carcinoma in 18 (28.57%) cases. Evidence of CIN and and invasive leisons in colposcopy directed cervical biopsy among the VIA positive patients strongly suggested the need of VIA as an essential screening test.

Within 63 acetowhite positive cases, 47 cases (74.6%) had positive findings by colposcopy and 38 cases (60.32%) had positive findings by biopsy. True positive cases were 36 and true negative cases were 14. False positive were 11 and false negative were 2. In this study sensitivity and specificity of colposcopy examination were found 94.74% and 56% respectively. Many studies have reported sensitivity of colposcopy as 87-99%, 96% and 94.4% which is comparable to our study<sup>17,18,19</sup> Specificity of colposcopy in our study was consistent with many studies which reported specificities of 26-87%, 57%, 50% and 46.42%<sup>17,20,21</sup>. There is high sensitivity but low specificity of colposcopy may be due to high incidence of unsuspected acetowhite epithelium which might be due to inflammation, immature metaplasia and latent HPV infection<sup>11</sup>. In our study positive predictive value is 76.6% and negative predictive value is 87.5%.

The limitation of Colposcopy is its dependence on observer variability and relatively weaker performance in differentiating normal cervix from low grade leisons<sup>11</sup>. The colposcopic diagnosis of CIN requires an understanding and recognition of four main features- colour tone intensity of acetowhitening, margins and surface contour of acetowhite area, vascular pattern and iodine staining. Variations in quality and quantity of these atypical appearances



help in differentiating CIN from other lesions and between grades of CIN<sup>22</sup>.

### Conclusion:

Cervical cancer continues to be a major public health problem that kills approximately a quarter of million women every year and affects developing countries and young women in particular. Colposcopy was found to be useful in understanding the morphology of the cervical lesions, both of the neoplastic and the non neoplastic ones and this was very helpful in planning their management. A detailed colposcopic evaluation of the cervix with a guided biopsy is an important diagnostic method for the detection of preneoplastic and early cervical cancer. So wide use of colposcopy in screening program of Bangladesh can reduce the many young women's morbidity and mortality.

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