ORIGINAL ARTICLE

Role of Colposcopy in the Evaluation of Visual Inspection of Cervix with Acetic Acid-positive Cases of Unhealthy Cervix

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ABSTRACT

Introduction: Cervical cancer is the second most common cancer in women worldwide, and it is the principal cancer of women in most developing countries, where 80% of cases occur. This disease is preventable by screening and treatment of preinvasive condition. All sexually active women are at risk of acquiring a human papillomavirus (HPV) infection that may lead to cervical cancer in the future. Cervical cancer is a preventable disease as the different screening, diagnostic, and therapeutic procedures are effective. The screening procedures are visual inspection of cervix with acetic acid (VIA), Pap smear, colposcopy, and HPV deoxyribonucleic acid test. Among them, colposcopy is effective in screening, taking colposcopy-directed biopsy as well as treatment of cervical intraepithelial neoplasia (CIN), such as cold coagulation, cryotherapy, and loop electrosurgical excision procedure. Hence, there is an obvious need to subject the women with VIA-positive report to colposcopy and directed biopsy. This study is done to evaluate the role of colposcopy in evaluation of VIA-positive cases.

Objective: Colposcopic evaluation of VIA-positive cases and detection of precancerous lesion of cervix for early management.

Materials and methods: This was a cross-sectional study done among married female patient aged 22 to 65 years, who had VIA-positive report, and attending the colposcopy clinic in the Department of Obstetrics and Gynecology of Sir Salimullah Medical College and Mitford Hospital from January 2014 to December 2016. Colposcopy-directed punch biopsy was taken from the abnormal colposcopic appearance and specimen sent for histopathological examination.

Results: Out of 97 cases, all had VIA-positive acetowhite areas. But colposcopy revealed that 76.29% had CIN and invasive lesions, while 23.71% had either normal or inflammatory lesions. Colposcopy-directed punch biopsy revealed that 59.79% cases had positive lesions like CIN or invasive carcinoma and 40.21% had neither CIN nor invasive lesions. Among positive lesions, about 34.02% had CIN I, 3.09% had CIN II, 0% had CIN III, and 22.68% had invasive carcinoma. In this study, sensitivity and specificity of colposcopy examination were found 94.83 and 51.28% respectively.

Conclusion: Cervical cancer presents as major cause of morbidity and mortality, especially in developing countries like Bangladesh. In developing countries, the various screening programs are implemented for its early detection and treatment. It is evident that colposcopy plays a very important role in early diagnosis and treatment of preinvasive and early invasive carcinoma of cervix. So wide use of colposcopy in screening program of Bangladesh can reduce many young women's morbidity and mortality.

Keywords: Acetic acid-positive cases, Colposcopy, Unhealthy cervix, Visual inspection of cervix.

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INTRODUCTION

Colposcopy is a diagnostic procedure to examine an illuminated magnified view of the cervix and tissues of the vagina and vulva. Many premalignant and malignant lesions in these areas have noticeable characteristics which can be detected through colposcopy.[1]

Cervical cancer is the commonest form of cancer in women in virtually all developing countries and is the second most common cancer in women worldwide.[2] Every year, 17,686 women in Bangladesh are diagnosed with cervical cancer and 10,364 women die from the disease.[3] Hospital-based data revealed that cervical cancer constitutes 22 to 29% of female cancer in Bangladesh.[3] There are estimated 450,000 new cases worldwide with about 300,000 deaths each year.[4] Of the new cases

detected, 86% occur in developing countries and 14% in developed countries.[2] In developed nation, the figures for invasive cervical cancer are much lower due to adaptation of different screening tests.[2]

Invasive squamous cells cervical cancers are preceded by a long phase of preinvasive disease, collectively referred to as CIN. This CIN may be categorized into grades I, II, and III depending on the proportion of the thickness of the epithelium showing mature and undifferentiated cells.[3] The precancerous stage is quite long and ranges from 7 to 20 years, which enables early diagnosis at this stage.[3] Persistent infection with one or more of the oncogenic subtypes of HPV is necessary cause for cervical neoplasia.[3] Studies have shown that HPV is responsible for more than 90% of the cases of invasive cervical cancer worldwide, and it is related to 80% of precancerous changes in the cervix.[5] The risk factors for high prevalence of cervical cancer in Bangladesh are related to early marriage, early starting of sexual activities, multiparity, sexually transmitted diseases, and low socioeconomic condition. Therefore, understanding of etiological factors are important for the successful prevention of the disease.[2]

MATERIALS AND METHODS

This was a cross-sectional study done among married female patients who had VIA-positive report attending the colposcopy clinic in Department of Obstetrics and Gynecology of Sir Salimullah Medical College and Mitford Hospital from January 2014 to December 2016. A total number of 97 women were included in this study having age range between 22 and 65 years. Colposcopy-directed punch biopsy was taken from the abnormal colposcopic appearance and specimen sent for histopathological examination.

All the patients underwent both the acetic acid and the Schiller's iodine test before they were subjected to colposcopic-directed biopsies. The biopsies were taken from the acetowhite areas and iodine negative areas.

RESULTS

Out of 97 patients, 46 (47.42%) were in the age group of 26 to 35 years and 31 (31.96%) were between 36 and 45 years (Table 1); 94 (96.91%) patients were housewife; 24 (24.74%) of their husband's occupation were business; and

Table 1: Age distribution of the patients

Age in years (n = 97)	Frequency	Percentage
20–25	5	5.15
26–35	46	47.42
36–45	31	31.96
46–55	12	12.37
>56	3	3.09

Table 2: Distribution of the patients by sociodemographic characteristics (n = 97)

Variables	Frequency	Percentage
Patient's occupation		
Housewife	94	96.91
Day labor	0	0
Service	3	3.09
Husband's occupation		
Service	20	20.62
Business	24	24.74
Day labor	13	13.40
Driver	14	14.43
Agriculture	10	10.31
Unemployed	4	4.12
Abroad	4	4.12
Died	8	8.25
Yearly family income (Taka)		
<10,000	7	7.22
10,000–20,000	75	77.32
21,000–30,000	6	6.19
31,000–40,000	0	0
>41,000	9	9.27

20 (20.62%) were doing service. The yearly family income of 75 (77.32%) patients was 10,000 to 20,000 (Table 2).

Regarding the risk factors, 21 (21.65%) patients were married before the age of 15 years and 72 (74.23%) were married between the age of 15 and 20 years; 67 (69.07%) patients had their first child before the age of 20 years; 41 (42.27%) of them had 3 to 4 children (Table 3).

The findings on colposcopy showed out of 97 VIA-positive patients, 3 (3.09%) had normal colposcopic findings. Colposcopy showed inflammation of cervix in 20 (20.62%) cases, CIN I in 45 (46.39%) cases, CIN II in 12 (12.37%) cases, CIN III in 4 (4.12%) cases, and invasive cervical carcinoma in 13 (13.40%) cases (Table 4).

Later on, histopathology of biopsy showed normal findings in 5 (5.15%) cases, inflammation in 34 (35.05%)

Table 3: Distribution of study subjects according to risk factors of cervical cancer (n = 97)

Variables	Frequency	Percentage
Age of marriage		
<15	21	21.65
15–20	72	74.23
>20	4	4.12
Age of first child		
<15	4	4.10
15–20	67	69.07
>20	24	24.74
Number of children		
No children	2	2.06
1–2	38	39.18
3–4	41	42.27
>4	16	16.49
Abortion	19	19.59
Menstruation regulation	17	17.53

Table 4: Distribution of study subjects according to colposcopic findings

Findings	Number (n = 97)	Percentage
SCJ visualized	87	89.69
SCJ not visualized	10	10.31
AW lesion present	97	100
Normal	3	3.09
Inflammation	20	20.62
Colposcopy negative	23	23.71
CIN I	45	46.39
CIN II	12	12.37
CIN III	4	4.12
Invasive cervical carcinoma	13	13.40
Colposcopy positive	74	76.29

AW: Acetowhite; SCJ: Squamocolumnar junction

Table 5: Histology results of biopsy findings

Biopsy findings	Number (n = 97)	Percentage
Normal	5	5.15
Inflammation	34	35.05
Biopsy negative	39	40.21
CIN I	33	34.02
CIN II	3	3.09
CIN III	0	0
Invasive carcinoma	22	22.68
Biopsy positive	58	59.79

cases, CIN I in 33 (34.02%) cases (Fig. 1), CIN II in 3 (3.09%) cases, CIN III in 0 (0%) case (Fig. 2), and invasive squamous cell carcinoma in 22 (21.68%) cases (Table 5).

Among the negative colposcopicay findings (23 cases) biopsy shows CIN I in 1 case and invasive carcinoma in 2 cases and among the positive colposcopy findings (74 cases) biopsy shows 5 normal and 34 inflammation (Table 6).

Table 7 shows among the 58 biopsy positive cases 55 cases are colposcopically positive and 3 are colposcopically negative. Among the 39 biopsy negative cases 20 cases are biopsy negative and19 cases are biopsy positive.

Sensitivity and Specificity Analyses

As all cases were VIA positive, the sensitivity and specificity of VIA could not be analyzed. But the sensitivity

Fig. 1: Dense acetowhite VIA positive lesion with fine mosaic pattern indicating low grade (CIN I) lesion

Fig. 2: Dense, opaque,thick acetowhite area, coarse punctuation and mosaicism indicating CIN III lesion

Table 6: Comparative findings of colposcopy and colposcopy-directed biopsy of VIA-positive cases

Colposcopy findings of all VIA-positive cases (n = 97)	Colposcopy-directed biopsy findings					
	Normal	Inflammation	CIN I	CIN II	CIN III	Invasive carcinoma
Colposcopy Negative (23) Normal (3) Inflammation (20)	4	16	1			2
Colposcopy Positive (74)						
CIN I (45)	1	17	26	1		
CIN II (12)		1	6	1		4
CIN III (4)				1		3
Invasive Carcinoma (13)						13
Total	5	34	33	3	0	22

Total biopsy positive: 58

Table 7: Sensitivity and specificity of colposcopy in detecting CIN

Colposcopic findings	Disease positive	Negative	Total
Positive	55	19	74
Negative	3	20	23
Total	58	39	97

Table 8: Accuracy of colposcopy for screening by statistical analysis

Colposcopy test accuracy	Result
True positive	55
False positive	19
True negative	20
False negative	3
Sensitivity	94.83%
Specificity	51.28%
Positive predictive value	74.32%
Negative predictive value	86.96%

and specificity of colposcopy were calculated considering colposcopy-directed biopsy as a gold standard.[2] Among the VIA-positive cases, 76.29% were positive in colposcopy and 59.75% positive in biopsy. The sensitivity and specificity of colposcopy were 94.83 and 51.28%, respectively, as shown in Table 8.

DISCUSSION

Colposcopy, a clinical method of proven accuracy, is an excellent means of evaluating clinically unhealthy cervix.[6]

In this study, the peak age group (47.42%) of VIA-positive cases was 26 to 35 years with a mean age of 30.74 years. Almost two-thirds of the cases were within 26 to 45 years. As the age advanced, the percent of age group reduced according to this study. Tofazzal et al[10] found highest incidence of years in age group closely followed by 30 to 40 years, where the age of occurrence of invasive cervical cancer was 40 to 45 years.[7] Jahan's findings correspond well with this study[8] and it is indicative that CIN is more prone to occur in sexually active women. World Health Organization[9] also suggested the priority age group as 35 to 45 years for the screening of CIN.[9]

The occupational status expressed that housewives (96.91%) were affected predominantly. Their husband's occupation were predominantly business, service, driver, and day laborer. Socioeconomic status had always been playing an epidemiological role in genesis of dysplasia.[10] In our study, 77.32% of the respondent's yearly family income was 10,000 to 20,000. Regarding the age of marriage, 74.23% got married at 15 to 20 years of age, which corresponds with the study of Rotkin ID[11]; 69.07% of the women had their first child at 15 to 20 years; 42.27% of the women had 3 to 4 children, indicating multiparity as a related risk for CIN of the cervix. This observation correlates with the study of Schiffman et al and Rotkin ID.[11,12] Smith believes that poor obstetrical and postpartum care and neglect of the symptoms of a lacerated and ulcerated cervix accounts for the (Mary and Daly, 1993) greater frequency of cervical cancer among the poorer classes (Jussawalla and Vole, 1987).[13,14]

In our study, out of 97 cases, all had VIA-positive acetowhite areas. But colposcopy revealed that 76.29% had CIN and invasive lesions, while 23.71% had either normal or inflammatory lesions. Colposcopy-directed punch biopsy revealed that 59.79% cases had positive lesions like CIN or invasive carcinoma and 40.21% had neither CIN nor invasive lesions. Evidence of CIN and invasive

lesions in colposcopy-directed cervical biopsy among the VIA-positive patients strongly suggested the need of VIA as an essential screening test. A high number of cases on histopathological examination were those of infection and among them majority had chronic cervicitis (35.05%).

Within 97 VIA-positive cases, 74 cases (76.29%) had positive findings by colposcopy and 58 cases (59.79%) had positive findings by biopsy. True positive cases were 55 and true negative cases were 20. False positives were 19 and false negatives were 3. In this study, sensitivity and specificity of colposcopy examination were found to be 94.83 and 51.28% respectively. Many studies have reported sensitivity of colposcopy as 87 to 99, 96, and 94.4%, which is comparable to our study.[15-17] Specificity of colposcopy in our study was consistent with many studies, which reported specificities of 26 to 87, 57, 50, and 46.42%.[15,17-19] 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.[20] In our study, positive predictive value is 74.32% and negative predictive value is 86.96%.

The limitation of colposcopy is its dependence on observer variability and relatively weaker performance in differentiating normal cervix from low-grade lesions.[20] The colposcopic diagnosis of CIN requires an understanding and recognition of four main features: Color 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.[21]

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.[22] Cervical cancer occurs at a relatively young age, resulting in proportionally more life-years lost, compared with other major cancers. Age-specific analysis clearly indicates that cervical cancer primarily affects young adult women who are actively

involved in their careers or caring for their families.[22] It is evident that colposcopy plays a very important role in early diagnosis and treatment of preinvasive and early invasive carcinoma of cervix. So wide use of colposcopy in screening programs of Bangladesh can reduce many young women's morbidity and mortality.

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