OPEN ACCESS
Scholars International Journal of Obstetrics and Gynecology
Abbreviated Key Title: Sch Int J Obstet Gynec
ISSN 2616-8235 (Print) |ISSN 2617-3492 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Colposcopic Findings of Cervix in VIA (Visual Inspection of Cervix by Acetic Acid) Positive Cases at BSMMU, Dhaka, Bangladesh

Taslima Akter[1*], Ayesha Siddika[2], Khadiga Akter[3], Sabina Akhter[4], Mohammad Anamul Haque[5], Nasima Akther[6]

[1]Resident Surgeon (Obstetrics and Gynaecology), Shaheed Taj Uddin Ahmad Medical College Hospital, Gazipur, Bangladesh
[2]Registrar (Obstetrics and Gynaecology), Shaheed Taj Uddin Ahmad Medical College Hospital, Gazipur, Bangladesh
[3]Medical Officer (Obstetrics and Gynaecology), Mugda Medical College Hospital, Dhaka, Bangladesh
[4]Registrar (Obstetrics and Gynaecology), Sylhet M. A. G Osmani Medical College Hospital, Sylhet, Bangladesh
[5]Assistant Professor (ENT & Head Neck Surgery), Shaheed Taj Uddin Ahmad Medical College, Gazipur, Bangladesh
[6]Assistant Professor (Obst & Gynae), Sylhet M.A.G Osmani Medical College, Sylhet, Bangladesh

DOI: 10.36348/sijog.2022.v05i10.001 | **Received:** 16.08.2022 | **Accepted:** 24.09.2022 | **Published:** 09.10.2022

***Corresponding author:** Taslima Akter
Resident Surgeon (Obstetrics and Gynaecology), Shaheed Taj Uddin Ahmad Medical College Hospital, Gazipur, Bangladesh

Abstract

Introduction: Cervical cancer is the most common form of cancer in women in developing countries and the second most common form of cancer in the world as a whole. An estimated 468,000 new cases of cervical cancer and 233,000 deaths occurred in the year 2000. Cervical cancer constitutes about 26% of female cancer in different areas of Bangladesh. ***Objective:*** To find out the role of VIA for the detection of precancerous and early cancerous lesions of the cervix with co-relation of colposcopic findings and ultimate. ***Methods:*** A prospective study was conducted from January, 2010 to June 2010 on 100 women attending at the "Colposcopy Clinic" of Gynae Oncology Division of Department of Obstetrics and Gynaecology of BSMMU, Dhaka. Only VIA positive cases were taken into consideration for the study. ***Results:*** The mean age of the participants were 33.39 years (range 18-60) with 41.0% in the age group between 36-45 years. Among all the subjects, the majority (75%) was housewives and 70.0% the patients hailed from urban area. The yearly incomes of 46% families were between 50,000 to 60,000 Tk. The mean parity of the respondents was 1.75 and 4. More than 4 children were found in 14% cases. Up to 35.0% had 2 children only. About 46.0 % had experienced menarche at the age 13 years and the range was 12-14 years. In regard to risk factors, 64% used hormonal methods. Among the participants 80% experienced first coitus of age between 13-20 years. Excessive vaginal discharge and backache were the principal complaints. Colposcopy evaluated 65 cases as CIN (CIN I 34 %, CIN 11-17%, CIN-III 14%) and 3.0% as invasive lesions. Biopsy evaluated 45% as CIN (CIN I-20% CIN-15%, CIN-III 10%) and 1% as invasive lesions. The sensitivity and specificity of colposcopy were 82.14 % and 50.00% respectively. This suggests the role of colposcopy in the evaluation of CIN and cervical cancer. ***Conclusion:*** The study concludes that the VIA and colposcopy are the important methods of diagnostic tools for the diagnosis of cervical pre-malignancy. 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 through it requires considerable training and experience.

Keywords: Colposcopicy, Cervix, VIA, Bangladesh.

INTRODUCTION

Cervical cancer is the most common form of cancer in women in developing countries and the second most common form of cancer in the world as a whole [1]. An estimated 468,000 new cases of cervical cancer and 233,000 deaths occurred in the year 2000 [2]. Cervical cancer constitutes about 26 % of female cancer in different areas of Bangladesh [3]. Almost 80% of cervical cancer occurs in the developing countries. Bangladesh and India have annual incidence of cervical cancer 11956 and 1,25,952 respectively [4]. In developed nations, the figures for invasive cervical cancer are much lower due to adaptation of different screening tests. Cervical cancer is both a preventable and curable disease preventable by cervical sereening and curable, especially if identified at an early stage. In developing countries, which lack screening programs the incidence may be up to six times higher than in developed countries, with up to 80% of patients presenting with advanced disease. In our country most of the cervical cancers are diagnosed at the advanced stage, so mortality is high. According to the WHO statistics, new cancer cases in Bangladesh have been estimated at 167 per 1,00,000 population [5]. Cancer

possesses serious health problem both in the developed and developing countries. The prevention and control of cancer in developing countries deserve urgent attention. The problem of cancer in Bangladesh is particularity acute because of poverty, early age of marriage, multiple marriage, promiscuity, other sexual habit, multi parity, illiteracy and other diseases associated with poor nutrition. Therefore, understanding the etiological factors is important for the successful prevention of the disease [6]. World Health Organization considers cervical cancer as a preventable disease. This is because cervix is an easily accessible organ, it has a long pre-malignant phase and it can be diagnosed in its precancerous phase [7]. Cervical cancer is a leading cause of cancer death among women in low resource settings. The decrease in cervical cancer prevalence in most of the developed countries is attributed to the success of cytology based screening program but our country is poor so we often lack the necessary resources to use the Pap smear as a screening tool for cervical cytology. Because the incidence of cervical cancer is highest in low resource setting of women more than 35 years age, alternative technique have been sought. Recently visual inspection of cervix with acetic acid (VIA) has gained popularity [8]. There are also many lesion occur in cervix such as ectropion, cervical polyp, nabothian cyst, leukoplakia, condylomata which are diagnosed during VIA and Colposcopy. The main technique involves the application of 3-5% acetic acid (House hold vinegar) on the cervix followed by inspection of the cervix 1 minute later for the presence of acetowhite areas. The V1A positive cases are then subjected to colposcopy and directed biopsy. It is the procedure in which the cervix is visualized through optical instruments used to detect changes in the cellular pattern of the covering epithelium and vascularity of the underlying tissue. Colposcopy is a clinical method of detection of cervical cancer and CIN. Worldwide successful cervical cancer prevention is based on screening program. However, a generalized screening program is difficult to implement in developing countries, where resources are scarce. Although cytology is being carried out in developing countries like Bangladesh, this is mostly done in the context of opportunistic screening activities, which are inadequately performed and of poor quality [9]. In some developed and in some developing countries, cervical cytology test for carcinoma of cervix and cervical intraepithelial neoplasia (CIN) has become a routine procedure. WHO suggested an alternative to regular cytologic screening known as "down staging screening" as an experimental approach. It can be defined as the "the detection of the disease in an earlier stage when still curable by nurses and other non- medical health personnel using a simple speculum for visual inspection of the cervix. In Bangladesh, where prevalence of cancer is high and cytological screening is not available, down staging screening may be useful. There are several reasons for these limits, ranging from the nature of participation of women in screening programs to the access and timely completion of treatment when necessary. The aim of this study is to find out the role of VIA for the detection of precancerous and early cancerous lesions of the cervix with co-relation of Colposcopic findings and ultimate objective to assess whether VIA could be used as a mass screening test with limited resources.

MATERIALS & METHODS

Study Design:

This is a prospective type of observational study.

Study Place:

Colposcopy clinic of the Gynae Oncology Division of Department of Obstetrics & Gynaecology, Bangbandhu Sheikh Mujib Medical University Hospital, Shahbag, Dhaka, Bangladesh.

Participants:

This study was carried out among the VIA positive cases attending the colposcopy Clinic of the Gynae Oncology Division.

Study Period:

From January 2010 to June 2010.

Study Procedure:

The study was carried out among patients attending Gynae oncology out door of BSMMU with different clinical complaints like pervaginal discharge, postcoital bleeding, dyspareunia, irregular pervaginal bleeding, backache, abnormal cervix on examination age between 18-60 years and was advised for VIA test. This test was carried out at the VIA and colposcopy clinic of Gynae Oncology Division of Department of Obstetrics & Gynaecology. Those who were positive for VIA test were sent for colposcopic examination and for the detection of site of biopsy. Biopsy was taken and report was correlated with the VIA positive cases. They were explained about the procedure and written consent was obtained beforehand. Clinical history, physical examination, colposcopic findings and biopsy report were recorded in a prescribed questionnaire.

Sample Size:

100 VIA positive cases were considered for this study.

Main Outcome Measures:

Outcome measures were contained the following points:-

1. Risk factors.
2. Clinical findings.
3. Related obstetrical and gynecological history.
4. Result of VIA.
5. Findings of colposcopy.
6. Biopsy report.
7. Relation of VIA positive with colposcopy examination findings.

Selection Criteria:

Inclusion Criteria:

1. History of early sexual activity.
2. Age between 18 to 60 years.
3. Abnormal vaginal discharge.
4. Post coital bleeding.
5. Dyspareunia, irregular pervaginal bleeding.
6. Post-menopausal bleeding.

Exclusion Criteria:

1. Menstruating women or PV bleeding present.
2. Pregnancy.
3. Obvious growths or big mass at the cervix.
4. Advanced stage of cervical cancer.
5. Vaginal stenosis.

Data Maintenance, Entry & Analysis:

All data were entered & checked, rechecked & scrutinized by the principal investigator following standard procedure & were analyzed by SPSS programe.

RESULTS

The age of the patients was in the range of 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. Most of the patients (75%) had no formal occupations i.e. they were housewives. 10% and 15% women were involved in office job and were garment workers. Among the respondent, 43 (43%) had satisfactory personal hygiene and 57(57%) cases had unsatisfactory maintenance of their personal hygiene. Regarding the distribution of the husbands occupation of the study patients, more than one third of the cases husbands (37%) were businessmen and 15 (15%) were government servant and 20 (20%) were farmer which was the second highest among the husband jobs. Only single case (1%) was job in abroad. In regard to the number of children of the cases, 51% participants had 2-4 children in their families. 14 women (14%) had 4 or more Children. Other women had 2 or fewer children. Almost 50% family had yearly income ranging from 50,000 to 60,000 Tk. 70 (70%) of the study subjects came from urban area and 30 (30%) from rural area. The people residing in the urban area were more than double than that of the rural area. Menstruation continued in 91% cases and history revealed that 31 cases (3 4.0%) had irregular menstruation and the rest 60 cases (65.93%) had regular menstruation with the period ranging from 2-7 days. Among the cases having regular menstruation, 35 (38.40%) had 4-5 days duration of the cycle, that is the highest group within regular cycle group. In 69.3% cases had average menstrual flow (Table-1).

Table 1: Distribution of patients by personal and Socio-economics characteristics (n=100)

Variables	Frequency	Percentage
Age in Years		
18-25	20	20%
26-35	25	25%
36-45	41	41%
46-55	10	10%
56-60	4	4%
Occupation		
Unemployed/ Housewife	75	75%
Garments /Industrial Workers	15	15%
Secretarial Jobs	10	10%
Personal Hygiene		
Satisfactory	43	43%
Unsatisfactory	57	57%
Husband's Occupation		
Farmer	20	20%
Businessman	37	37%
Govt. Service	15	15%
Private Job	15	15%
Richshaw Puller	12	12%
Abroad	1	1%
Number of Children		
Up to 2	35	35%
2-4	51	51%
4 or more	14	14%
Yearly family income in taka		
30000-40000	11	11%
40001-50000	33	33%

50001-60000	46	46%
>60000	10	10%
Residence		
Urban	70	70%
Rural	30	30%

Table 2: Obstetrical history of the Subjects (n=100)

Variables	Frequency	Percentage
Married for (n=100)		
<10 Years	13	13
10-15 Years	23	23
16-20 Years	32	32
21-25 Years	22	22
25-30 Years	7	7
31-35 Years	3	3
Para (n=79)		
No Children	3	3.09
Up to 2	39	40.2
2-4	44	45.3
4 or more	10	10.3
Age of 1st Intercourse (n=100)		
13-20 Years	80	80
20-25 Years	18	18
25-30 Years	2	2
Age of first Delivery (n=97)		
14-16 Years	40	41.23
17-20 Years	57	58.76
MR(n=97)		
Done	65	67.01
Not Done	32	32.98
Abortion (n=97)		
Present	70	72.16
Not Present	27	27.83

Table-2 shows that 13 cases (13.0%) had passed less than 10 years after their marriage. The period elapsed 31- 35 years after marriage was only in 3.0% cases. Regarding para, 3 Cases had no children and 10 cases had 10 children each. In regard to age of the 1st intercourse - 80 (8 0.0%) had their first intern course at the age of 13-20 years and rest 18(18.0%), at age of 20-25 years and 25-30 years, 40 (41.23%) had first delivery occur at age of 14-16 years and 57(58.76%) had at age of 17-20 years. 65 (67.01%) MR done, and 70 (72.16%) had history of abortion.

Table 3: Distribution of sign-symptoms of the patients (N=100)

Variables	Number	Percentage
No sign-symptoms	39	39.0
Intermenstrual bleeding	9	9.0
Post coital bleeding	20	20.0
Excessive vaginal bleeding.	29	29.0
Heavy irregular bleeding	3	3.0

Table-3 shows that 39.0% cases had no sign-symptoms. Post coital bleeding, excessive vaginal bleeding intermenstrual bleeding and heavy irregular vaginal bleeding were in 20.0%, 29.0%, 9.0% and 3.0% respectively.

Table 4: Distribution of Per Speculum examination findings of the study subjects (n=100)

Speculum findings	Frequency	Percentage
Apparently Healthy cervix	79	79.0
Erosion	19	19.0
Nodular	1	1.0
Ulcer	2	2.0
Total	**100**	**100**

Table-4 reveals that in about 79% cases had apparently healthy cervix on per speculum examination cervical erosion noted in 19.0%, nodules found in 1.0% and ulcer found in 2.0% cases. Ulcer means sloughing out margin. Nodules means rounded structure and hard in consistence.

Table 5: Bimanual examination findings of the uterus, fornices and cervices (N=100)

Parts	Frequency and Percent	
Examined	Normal (%)	Abnormal (%)
Uterus	85 (85)	15 (15)
Fornices	85 (85)	15 (15)
Cervix	85 (85)	15 (15)

In regard to bimanual examination, uterus and fornices were normal in 85.0% cases. The findings in the cervix were almost the same i.e.86.0% cases had normal findings and only 14.0% had abnormal cervix in the bimanual examination. Abnormal interest uterus means bulky, retroverted, fixed and tender uterus. Abnormal cervix means broad, tender, barrel shaped and ulcerated cervix. Abnormal fornix means tender, nodules and inflammatory deposit in the fornices. This is shown in the table-5.

Table 6: Distribution of Colposcopic findings (n=100)

Colposcopic findings	Number	Percentage
Squamo-columnar junction		
clearly visualized	90	90.0
Not clear	10	10.0

Table 7: Distribution of Colposcopic findings with clearly visualized Squamo-columnar junction (n-100)

Findings proper	Number	Percentage
Normal	10	10.0
Inflammation	22	22.0
CIN I	34	34.0
CIN II	17	17.0
CIN III	14	14.0
Invasive carcinoma	03	03.0

Shown in the table-7 the squamocolumnar Junction was clearly visualized in 90 cases and not clear in 10 cases. Colposcopically healthy cervix was in 10 cases. Suspected inflammation, CIN I, CIN II and CIN III were noted in 22%, 34%, 17% and 14% cases respectively. Invasive carcinoma was found in 3% cases.

Table 8: Shows histopathology report of biopsy specimen (n=100)

Biopsy findings	Number	Percentage
Normal	14	14.0
Inflammation	40	40.0
CIN I	20	20.0
CIN II	15	15.0
CIN III	10	10.0
Invasive carcinoma	1	1.0

Table-8 shows histopathology report of biopsy specimen of 100 cases. Among the study subjects Cervical Intraepithelial Neoplasia (CIN) were found in 45(45%) cases of which CIN I, CIN II and CIN III were found in 20 (20.0%), in 15 (15%) and in 10 (10%) cases respectively. Invasive carcinoma was found in 1 (1%) and inflammation was in 40 (40%) cases.

Table 9: Colposcopy directed biopsy (CDB) findings and their Colposcopy directed biopsy (CDB) 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 (32)	Normal (10)	9	1				-
	Inflammation (22)	2	10	6	2	2	-
Colposcopy positive (68)	CIN I (34)	3	16	10	3	2	-
	CIN II (17)	-	9	2	5	1	-
	CIN III (14)	-	4	2	4	4	-
	Invasive Carcinoma (3)	-	-	-	1	1	1
	Total	**14**	**40**	**20**	**15**	**10**	**1**
				Total Biopsy Positive=46			

Table 10: Sensitivity and specificity of colposcopy in detecting CIN (N=100)

Colposcopic Findings	**Disease**		**Total**
	Positive	**Negative**	
Positive	46	22	68
Negative	10	22	32
Total	**56**	**44**	**100**

Table-10 shows 32 colposcopy negative cases 10 patients were found to have CIN or cervical biopsy (false negative) and rest of them i.e.22 cases had no evidence of CIN or malignancy (true negative). In our study sensitivity and specificity of colposcopic examination was found 82.14% and 50.00% respectively.

DISCUSSION

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. 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 1 8-60 years. All VIA positive cases of this age group attending the "Colposcopy Clinic" of Gynae Oncology Division of Department of Obstetrics and Gynaecology at BSMMU from January, 2010 to June 2010 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. 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 V [10], (35.67+ years) and Sankarnarayan *et al.,* [11] (3 8.917 years). 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. *et al.,* [12] (2003) and Jahan Y *et al.,* [10] found about 32% and 35% cases in 36-45 age group & 38.46% and 33% cases in 26-35 age groups. Tofazzal N *et al.,* [7] 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. 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 [12]. WHO also suggested the priority age group 35-45 years for the screening of CIN. The occupational status expressed that housewives were affected predominately and then was females engaged in garments works. Office workers affected least in descending order. In this study most of the cases were from urban areas. Syeeda and Jahan had also got similar urban-rural distribution among the participants of their studies. This may be due to awareness among the urban population about the problem and also because of the location of the hospital where the study was conducted. More than half of the respondents had 3-4 children indicating multiparty as a related risk for CIN of the cervix. Studies in our countries by Syeeda and Ishrat also support the influence of multiparty 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 58.1%, which is higher than the national contraceptive use rate i.e. 64% [13]. This justifies the role of hormone for the development of cervical maligrancy. 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 (Jennifer *et al.,* xx) regarding age of first coitus 80% had experienced coitus within 13-20 years of age which corresponds with the study of Syceda S and Rotkin JD [9]. 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 68.0% had CIN and invasive lesions, while 32.0% had either normal or inflammatory lesions. Colposcopy directed punch biopsy revealed that 46.0% cases had positive lesions like CIN or invasive carcinoma and 54.0% 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, 68 cases (68%) had positive findings by colposcopy and among those, 46 cases were found to have positive biopsy findings (true positive) and 22 cases were false positive in VIA test when compared with CDB. Of the 32 colposcopy negative cases 10 patients were found to have CIN or cervical biopsy (false negative) and rest of them i.e.22 cases had no evidence of CIN or malignancy (true negative). In our study sensitivity and specificity of colposcopic examination was found 82.14% and 50.00% respectively. This result is near to the result 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 1 revealed sensitivity and specificity of colposcopic examination was 89.6% and 54.5% respectively [10]. Belinson JL *et al.*, [14] 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.

CONCLUSION

The study concludes that the VIA and colposcopy are the important methods of diagnostic tools for the diagnosis 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 through 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.

BIBLIOGRAPHY

1. David, M. L., & Philip, N. Baker Obstetrics and Gynaecology. An evidence-based test for MRCOG.
2. The Epidemiological study. The cancer research Institute of Bangladesh. 1976-81.
3. Park in et al 2001, parkin 1992.
4. Ferlay et al 2001.
5. httpfbanglapedia. search.com.bd/HT/C-0033htm..
6. Tofazzai, N., Khan, B. R., Islam, B., Muhsin, A., & Quddus. (1994). Study of the association of human papilioma virus with cervical cancer and precancerous lesions in a group of Bangladeshi women. *Bangladesh College of Physicians and surgeons*, 12, 85-88.
7. Saraiya, U. B. (1994). Cancer Screening in Gynecology. In: Ratnam, S. S., Rao, K. B., & Arulkumaran, S. (eds.) *Obstetrics and Gynecology, Orient Longman*, India, 2, 454-464.
8. Gaffikin, L., Lanterbach, M., & Blumenthal, P. D. (2003). Performance of visual inspection with acetic acid for cervical cancer screening. A qualitative Summary of evidence to date. *Obstetrics and Gynaecology*, 58(8), 543-550.
9. Roychowdhory, N. N. (2001). Genital Malignancy. In: D.C. Datta, Text Book of Gynecology, *3rd ed. New Central Book Agency*, India. 310-360.
10. Jahan, Y. (2005). *Colposcopic findings of VIA positive gynaecological cases at BSMMU.* Dissertation submitted to BCPS.
11. Nene, B. M., Deshpande, S., Jayant, K., Budukh, A. M., Dale, P. S., Deshpande, D. A., ... & Sankaranarayanan, R. (1996). Early detection of cervical cancer by visual inspection: a population-based study in rural India. *International journal of cancer*, *68*(6), 770-773.
12. Yisrat, J. (2004). Colposcopic Findings of VIA positive Gynecological cases of BSMMU study in a group of Patients attending Colposcopy Clinic at BSMMU; *BCPS Dissertation*, Dhaka.
13. Bangladesh Health and Demographic Survey, NIPORT, DGFP. Dhaka, 2001.
14. Belinson, J. L., Pretorius, R. G., Zhang, W. H., Wu, L. Y., Qiao, Y. L., & Elson, P. (2001). Cervical cancer screening by simple visual inspection after acetic acid. *Obstetrics & Gynecology*, *98*(3), 441-444.