Bangladesh J Obstet Gynaecol, 2018; Vol. 33(1): 63-73

Review Article

Cervical Cancer Screening Program in Bangladesh

ASHRAFUN NESSA[1], SALEHA BEGUM CHOWDHURY[2], PARVEEN FATIMA[3], MOHAMMED KAMAL[4], MOHAMMAD SHARIF[5], ABUL KALAM AZAD[6]

Abstract

Background: *Cervical cancer (CC) is the fourth most common cancer in women worldwide with an estimated 569,847 new cases and 311,365 deaths in the year 2018. In Bangladesh, the incidence of CC was 8068 and 5214 women died from CC in the year 2018.[1]CC constitutes about 12% of the female cancer in this country.[1]*

Methods: *The present situation of cervical cancer screening program is reviewed.*

Results: *The Government of Bangladesh (GOB) adopted visual inspection of cervix with acetic acid (VIA) method for cervical cancer screening. The major strengths of VIA is its simplicity, low cost, potential for immediate linkage with investigations/treatment, feasible in low resource settings and the possibility of rapid training to the providers. The GOB has extended the program to all districts and selected upazilas.The screening programme has been implemented through capacity building of service providers of Medical College Hospitals (MCHs), District Hospitals (DHs), Mother and Child care Welfare Centers (MCWCs) and selected Upazila Health Compleses(UHCs) and several institutes.Service providersare performing VIA for the women of 30 years and above at about 417 VIA centres at primary, secondary and tertiary level health care facilities of 64 districts of Bangladesh. Screen positive cases are being referred to the colposcopy clinics of 14 government MCHs and BSMMU, where evaluation and management are carried out. From January 2005 to June 2017, 1647380VIA tests were performed at different facilities with 4.6%positivity.Among the VIA +ve women attending women at the colposcopy clinic of Bangabandhu Sheikh Mujib Medical University (BSMMU), 51% had precancerous or cancerous condition of the cervix, 3312 (14.10%) were treated by local excision, 2428 (10.30%)by local ablative method and1413 (6%) women with cervical cancer were referred to oncology. In Bangladesh, LEEPand thermal ablation has acquired acceptability as a commonly used treatment method for selected CIN and 'see-and-treat' approach for high grade diseases combining colposcopy and LEEP/ thermal ablation has been adopted since the year 2010 to improve compliance to treatment.*

Conclusion*: Bangladesh has established VIA as screening test for prevention of cervical cancer in quiet a good number of facilities with wide coverage. But the program has to be expanded readily to prevent cancer and reduce sufferings & untimely death of women due to this devastating disease.*

Key word: *Prevention of cancer cervix; prevention of cancer cervix in Bangladesh, VIA in Bangladesh. See & Treat of cervical cancer.*

Introduction:

Cervical cancer (CC) is the fourth most common cancer in women worldwide with an estimated 569,847 new cases and 311,365 deaths in the year 2018. In Bangladesh, the incidence of CC was 8068 and 5214 women died from CC in the year 2018.[1]CC

1. Professor, Department of Gynaecological Oncology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, Bangladesh;
2. Professor, Department of Obstetrics & Gynaecology, BSMMU, Shahbag, Dhaka, Bangladesh;
3. Professor, Department of Reproductive Endocrinology& Infertility, BSMMU, Shahbag, Dhaka, Bangladesh;
4. Professor, Department of Pathology, BSMMU, Shahbag, Dhaka, Bangladesh;
5. Director, (Maternal, child health services)& Line Director (Maternal, child,reproductiveand adolescent health), Directorate General of Family Planning, Kawranbazar, Dhaka, Bangladesh;
6. Director General, Directorate General of Health Services, Mohakhali, Dhaka, Bangladesh;

Address of Correspondence: Prof. Ashrafun Nessa, Professor, Department of Gynaecological Oncology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, Bangladesh; email: ashra58@yahoo.co.uk Tel: 01714088152

constitutes about 12% of the female cancer in this country.[1]In the year 2012, 11,956 new cases of CC were detected in Bangladesh and 6582 women died of the disease and CC constituted about 19.3% offemale cancer.[2] This indicated a reduction of CC incidence by 3888 (7.3%) and mortality by 1368 over a period of four years.CC is caused by the sexually transmitted Human papillomavirus (HPV), which is one of the most common viral infection of the reproductive tract.The high burden of CCis also due to lack of screening, high prevalence of risk factors like early initiation of sexual activity, multiparty,sexually transmitted diseases and low socio-economic status. Introduction of a CC screeningprogram to ensure wide coverage of the target population with management of screen positive cases with proper linkage to treatment was essential to reduce CC.Cytology based CC screening is the oldest and most widespread cancer screening technique. In the United Kingdomit began in the 1960s as opportunistic screening anddevelopment of organized screening programsince 1988 significantly reduced CC.[3]Cytology screening technique has led to effective reduction in the incidence and mortality from CC in many developed countries.[4,5] Tertiary centres of low resource countries became familiar with cytological test and started opportunistic screening in the mid-nineties, however due to difficulties in implementation, the CC burden remained unchanged. Many developed countries initiated HPV DNA test as the primary screening test by 2005.[6]A large-cluster randomized trial from rural India has shown approximately 50% reduction of CC after a single round of HPV screening (Hybrid Capture II).[7] However, the test is too expensive for introduction in many developing countries. For countries in resource-constrained settings, World Health Organization (WHO) recommended screening with VIA.[8]VIA involves naked eye inspection of the cervix under bright light at least one minute after the application of 3-5% dilute acetic acid using a cotton swab or a spray.A major benefit of VIA is that the result of screening test is available without delay and therefore additional investigations/management can be planned and carried out during the same visit. The Middle East and North Africa, have taken steps to implement national screening programs based on VIA.[9]The Government of Bangladesh (GOB) evaluated the feasibility of screening with VIA in 2005 and scaled up the program towards district level (2006-2010), and is now expanding the program towards sub-district level. In Bangladesh, screening is practiced currently by 417centres at primary, secondary and tertiary level health care facilities. The screen positive cases are being referred to the higher facilities, where colposcopy and management are carried out.[10,11,12]

Stakeholder's Orientation Workshop and Pilot Programme on CC Screening

An orientation workshopto initiate CC screening programmeheld in October, 2003 in Dhaka organized by Directorate General of Family Planning (DGFP) was attended by pathologists, gynaecologists, oncologists from different institutes, representatives from GOB, Bangladesh Cancer Society, Obstetrical and Gynaecological Society of Bangladesh (OGSB), different NGOs and women organizations. The workshop highlighted on awareness creation forCCprevention, screening, early detection and selection of suitable screening method in this country. A positive decision for launching pilot on CC screening programme based on VIA was taken within the existing government health infrastructure.The 'Pilot Programme' on 'CC screeningbased on VIA'was conducted by the Department of Obstetrics and Gynaecology of BSMMU and DGFPduring 2005 in 16 randomly selected districts through development of services at 16 District Hospitals (DHs), 16 Maternal and Child Welfare Centres (MCWCs)and 12 Union Health and Family Welfare Centres (UH & FWCs) with the technical support from UNFPA. After successful completion of the Pilot Programme, in the dissemination seminar in December 2005, Ministry of Health and Family Welfare (MOHFW) decided for expansion of the programme to remaining district level health infrastructure (MCHs, DHs, MCWCs) and incorporated clinical breast examination (CBE) for breast cancer screening. The target group for CC screening were all ever-married women aged 30 years and above and these women were encouraged to avail VIA and CBE after motivation whenever they attended the facilitiesfor different reasons.

Development of Guidelines for training:

'Cervical and Breast Cancer Screening Programme: Standard and Guideline','Trainers Handbook'and 'Trainee's Logbook' were developed to maintain standards of training and appropriate management protocol. The books contained basic information on CC screening and the training methodology was designed with participatory learning approach. The training manuals (English and Bengali version) and logbook were reviewed by international specialist and finalized through an workshop attended by DGHS, DGFP, BSMMU, OGSB, Surgeons, Pathologists, WHO, UNICEF,UNFPA in May 2006. The

mannualswere finally approved by the 'Curriculum Review Committee' of GOB in Nov, 2006.

Development of VIA facilities and Training of service providers:

During the Pilot Programme, the master trainers trained 113 service providers that included consultant of obstetrics&gynaecology, senior staff nurses (SSNs) family welfare visitors (FWVs)) from 16 selected districts and 12 selected unions (Table 1). Each batch (six persons) was trained for 12-15 days at the colposcopy clinic of BSMMU. They received extensive training on VIA method along with counseling, referral, follow up and management.Clinical skill was learned through examination of women in practical sessions.

Research during Pilot Programme

During the pilot programme research was performed on motivation of health personnel and community for setting up CC screening program and assessed feasibility of VIA method within the Government health infrastructure. The study was conducted in six out of 16 pilot districts to assess the attitude of women and their family to avail CC screening and service providers motivation to provide such screening services as part of their regular duties (without any additional financial benefit). Qualitative data were collected by focus groups discussions (FGDs) to gather information from the women, husbands, relatives on perception and attitude on CC prevention in their own cultural setting. Majority of the women and husbands were aware of 'cancer' irrespective of location of the cancer in the body. Very few of them knew about CC. Most of them (more than 90%) supported a test that would help to control a serious disease like CC when they were explained about it. Majority of them mentioned that there will be no resistance from the family for availing such test.

In-depth interviews were conducted with the service providers of the selected service centres and several centers from control areas to explore attitude related to introduction of CC screening programme within the existing mechanism. One to one interview was performed to assess personal opinion and three-fourths did not feel the services as burden on the current job without extra remuneration. About one-fourth of them felt it as an extra load and major causes of such feeling were 'insufficient staff' (63%), 'no separate auxiliary staff' (8.3%) or 'no separate room/ table' (12.5%) to manage these cases with privacy and with good quality services. They reported that more VIA trained staff, separate room with proper set-up should be provided for the service for introducing it as regular work. Only 6% of service providers wanted extra remuneration to provide this service.[13]

Various Activities in Bangladesh for Development and implementation of screening of carcinoma of cervix.

Box-I: *Development of cervical cancer screening program in Bangladesh.*

Year	Activities	Agencies
2003	Stakeholders orientation on screening of cervical cancer	GoB, DGFP, DGHS, OGSB,BSMMU, Bangladesh Cancer Somity, Oncologists, Pathologists from different institution, NGOs
2005	Pilot program on CC screening based on VIA in 16 DH, 16MCWC, 12UH & FWC. Research during pilot program Dissemination of Pilot program & inclusion of Breast cancer screening in the programme	GoB, DGFP, DGHS, BSMMU, UNFPA
2006	Pilot program on Breast cancer screening, Developing of standards & guidelines & curriculum	GoB, DGHS, DGFP, BSMMU, OGSB, WHO, UNICEF, UNFPA
2006 onwards	Development of colposcopy clinics at all GoB MCHs	GoB, BSMMU, DGHS, DGFP, UNFPA
2006-2010	Scaling up the screening services to remaining DHs, MCWCs, MCHs & other	GoB, DGFP, DGHS, BSMMU, UNFPA
2012-2018	Further scale up to selected UHCs Development of 'National Centre for Cervical and Breast Cancer Screening and Training at BSMMU'	MoHFW, DGHS, DGFP, BSMMU, UNFPA, WHO
Ongoing activity	1. Training programmes, 2. Development of new centres at UHCs, 3. Development of more colposcopy clinics 4. Development IEC materials 5. VIA & CBE out reach clinics. 6. Screening and management of the screening positive women. 7. Coordination, Supervision & monitoring 8. Special initiations from DGHS to improve performance 9. Record keeping & Data management 10. Treatment of cervical precancer	GoB, DGHS, DGFP, BSMMU, UNFPA, WHO

Scale up of the screening services to districts and selected sub-districts

GOB scaled up the programme towards remaining DHs and MCWCs of 48 districts with the technical support from BSMMU and UNFPA (2006-2010). Thereafter the programme is being scaled up by GOB and BSMMU towards selected sub-districts (2012-2018) through developing centres at UHCs. This screening programme has been implemented through capacity building of 93 Gynaecologists from Institutes, MCHs and DHs as master trainers and 2073 service providers (Doctors=393, Nurses/FWVs/ Paramedics=1680)from 64 districts between January 2005 to December 2017.[12] Service providers had Basic and Refresher training (six months to one year after basic training)following the guideline. About, 417 VIA centres are operational throughout the country by 2017 (Table 1).[10,11,12,14,15] The activities of the screening centres are shown in the Flow Chart (Fig 1).

Table-I

Total number of VIA and CBE centers (2005 to 2017)

Name of Locations	Number of Centers
District Hospitals	34
BSMMU, NICRH, ICMH Medical College Hospitals	34
MCHTI, MFSTC, MCWC	61
Upazila Health Complexes	248 out of 482
Union Health & Family Welfare Centres	30 out of 3725
BGB,CMH/ Private/NGOs	10
Total=	417

BGB=Border guard, Bangladesh. CMH=Combined Millitary Hospital

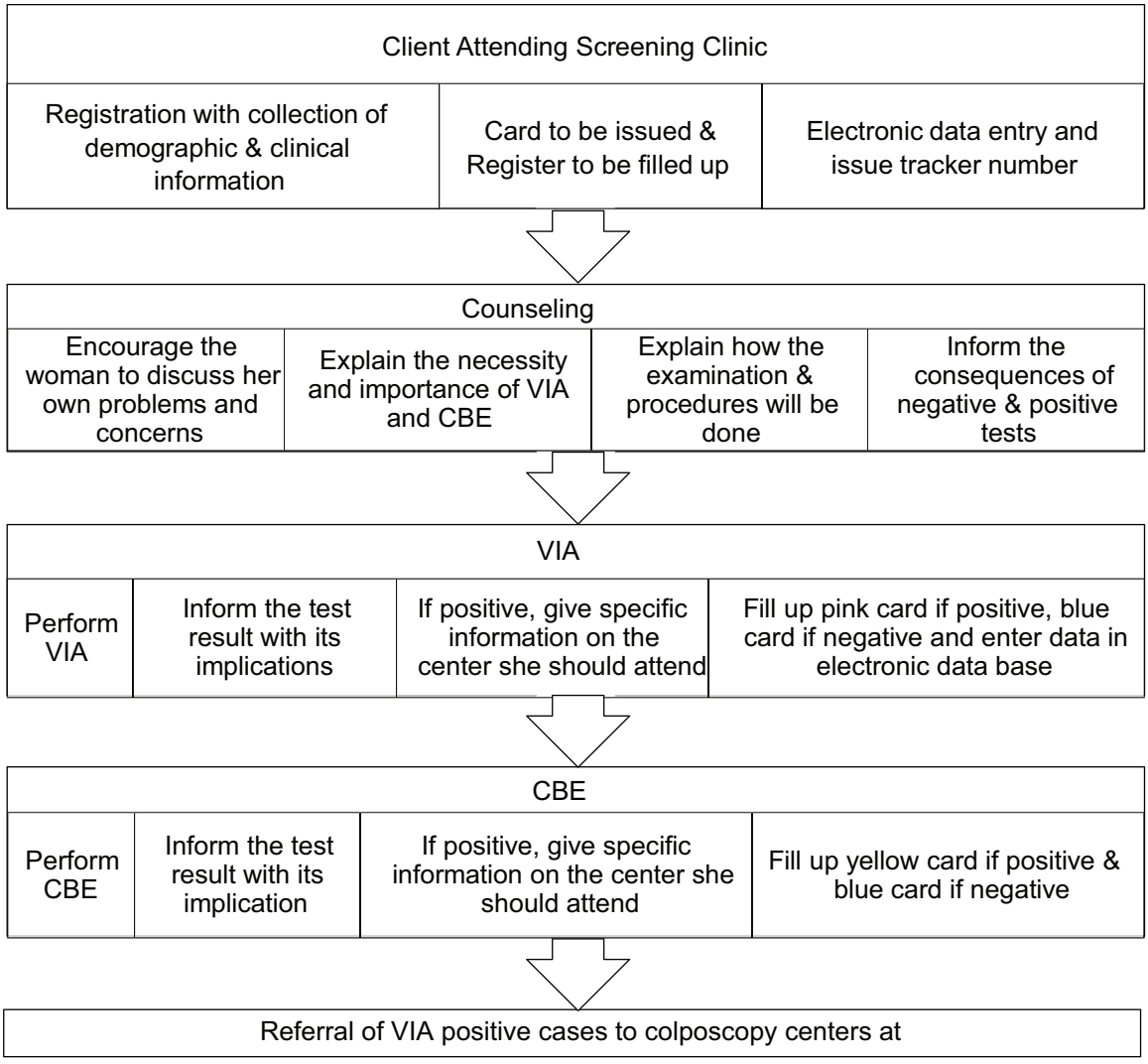

Fig 1: Flow Chart at the Screening Centre

With expansion of the screening program, GOB developed colposcopy clinics at 14 government MCHs. Screen positive cases are being referred to the colposcopy clinics of tertiary care facilities (BSMMU/ MCHs), where evaluation and management are carried out.[14,15,16]The activities of the colposcopy centres are shown in Fig 2. From January 2006 to June 2017, 160 postgraduate gynaecologists/SSNs from different MCHs/ BSMMU/ DHs received basic colposcopy training for 12 daysfrom BSMMU. During the training "Colposcopy and Treatment of Cervical Intraepithelial Neoplasia: A beginners Manual" on colposcopy and treatment of CIN published by International Agency for Research on Cancer (IARC) was used as the training guideline. Advanced colposcopy training was given to practicing colposcopists. Three teams of master trainers/colposcopistscomprising of 12

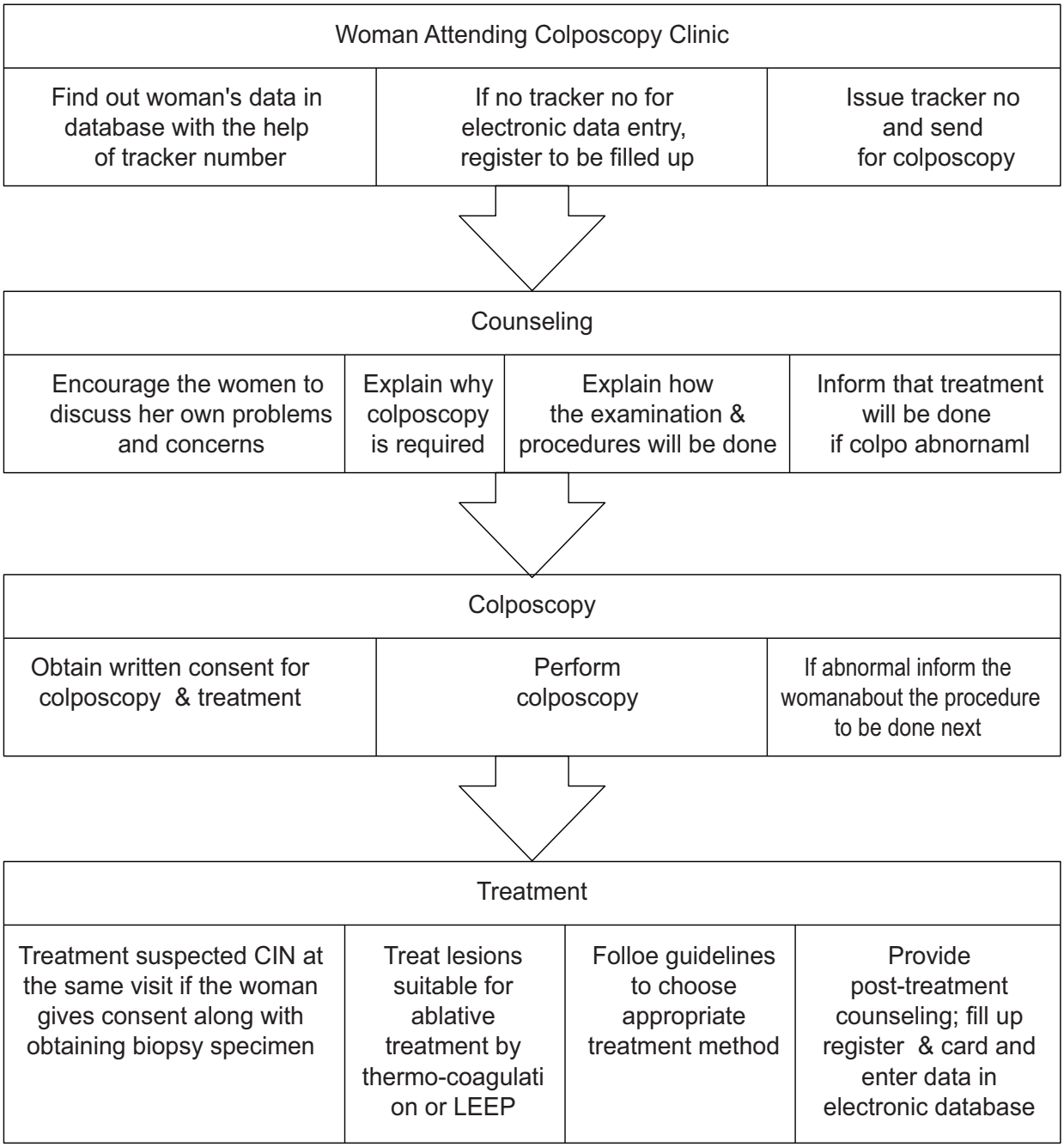

Fig 2: Flow Chart at the Colposcopy Centre

membersin each team including gynaecologsts/ programme managers/ nursesattended a course on 'Early Detection & Prevention of CC' at Barshijointly organized and facilitated by IARC,a Tata Memorial Centre Rural Cancer Project at Nargis Dutt Memorial Cancer Hospital, Barshi, and GOB (2006, 2011, 2016).

However, frequent transfer of trained colposcopists from MCHs, inadequate treatment facilities due to lack of logistics and inadequate arrangement for maintenance of equipments hampered quality service delivery.

Awareness raising activities during scale-up programme

Development and Printing of IEC Materials

IEC Materials (Brochure, two types of Poster, Flip Chart, Billboard) were developed on CC screening programme and approvals were taken from Ministry of Information and printed each year depending on availability of fund. Awareness creation activities were continued to develop service seeking behaviour among the community. Adequate materials (Brochure, two types of Poster, Flip Chart)were distributed to facilities and health education were encouraged both at community and health facilities. IEC Materials were distributed throughout the programme.

Orientation workshops

About 51 orientation meetings at selected districts and upazilawere held to motivate around 13000 health related service providers (Doctors, nurses, field service providers) and people from community to create awareness onCC screening programme. The participantsalso took part in training ongroup counseling with 'Flip Chart'Each of them were provided with a flip chart. They also participated in group works to find out ways to improve health seeking behavior of the community. Theysuggested 'Oral communication' as an important method of awareness creation in the communityon CC prevention. They emphasized on health education at service centres, *EPI sessions and counseling during home visit*etc.CC prevention should be an agenda of monthly meeting of UHCs, DHs, Union Perished meetings etc. They also suggested about use of printing materials like placement of billboard, poster, banner, leaflet, flipchart for improving cancer awareness. People need to be informed that VIA is done free of cost.

VIA and CBE Outreach Clinics:

'VIA and CBE Outreach Clinics' were organized for both providing services and awareness creation at about 200 centres in UHCs. Three to four days long 'VIA and CBE Outreach Clinics' had facilities of registration, counseling, screening, record keeping, evaluation and treatment for positive cases.

Coordination, Supervision and Monitoring

Supervision and monitoring visits are being arranged by combined team from GOB, BSMMU and other MCHs to visit different 'VIA centers' and colposcopy clinics to improve quality of services and performances of the programme.A checklist was used to assess the performances, set up, logistic supports and quality of services.

Fourteen divisional coordination workshops were arranged by Divisional Director, DGHS and BSMMU (2012-2018). The workshops were participated by all civil surgeons, DDFPs, Union Health and Family Planning Officers (UHFPO), Gynae and Surgery consultants, Nursing Supervisors, Family Planning Officers to evaluate the programme, assess performances of individual centres and to discuss about ways of improvement.

Special initiatives from DGHS to improve performances

DGHS issued several instructions to all service centres to improve performances mentioning cervical and breast cancer screening issue should be an agenda of monthly meeting at all the service centres, a signboard in front of the service centres should convey the massage that " VIA and CBE" are performed free of cost,at least 200 VIA and CBE need to be performed each month by each facility, monthly performances should be updated in MIS database. Cervical and breast cancer related health education activities should be incorporated in EPI and other health education. GOB also introduced "Cervical and Breast Cancer Prevention Week" to be observed every year.

Record-keeping and Data Management

All VIAand CBE facilities and colposcopy clinics follow a simple paper based record keeping system through maintenance of registry and providing VIA negative and positive cards with a registration number. The Management Information System (MIS) under the Directorate General of Health Services (DGHS) is

using DHIS-2 for monthly performance data from all facilities throughout the country. For population based organized screening, GOB has already developed an electronic database which included women's basic information, screening, colposcopy, treatment and follow up records. The computerized database should be maintained at each screening and all colposcopy centres. A mechanism to check the compliance of screen-positive women to colposcopy and/or treatment should be established by the government.

Performances of the Screening Programme

From January 2005 to June 2017, 1647380VIA tests were performed at different facilities; among the tested women, 752277 (4.6%)were found VIA-positive.[12]The coverage of the screening tests is increasing every year. (Fig 3).All VIA+ve cases were referred to colposcopy clinic at BSMMU and different medical college hospitals. Among the VIA positive women, 23588 (32%)attended the colposcopy clinic of BSMMU and about 51% of them had precancerous or cancerous condition of the cervix (Fig 4).[12]Among the attending women at BSMMU,3332 (14.10%) were treated by local excision (LEEP, Loop Electrosurgical Exicision Procedure), 2428 (10.30%)by local ablative method (thermo-coagulation) and1413 (6%) women with cervical cancer were referred to oncology (Table 3).[12]

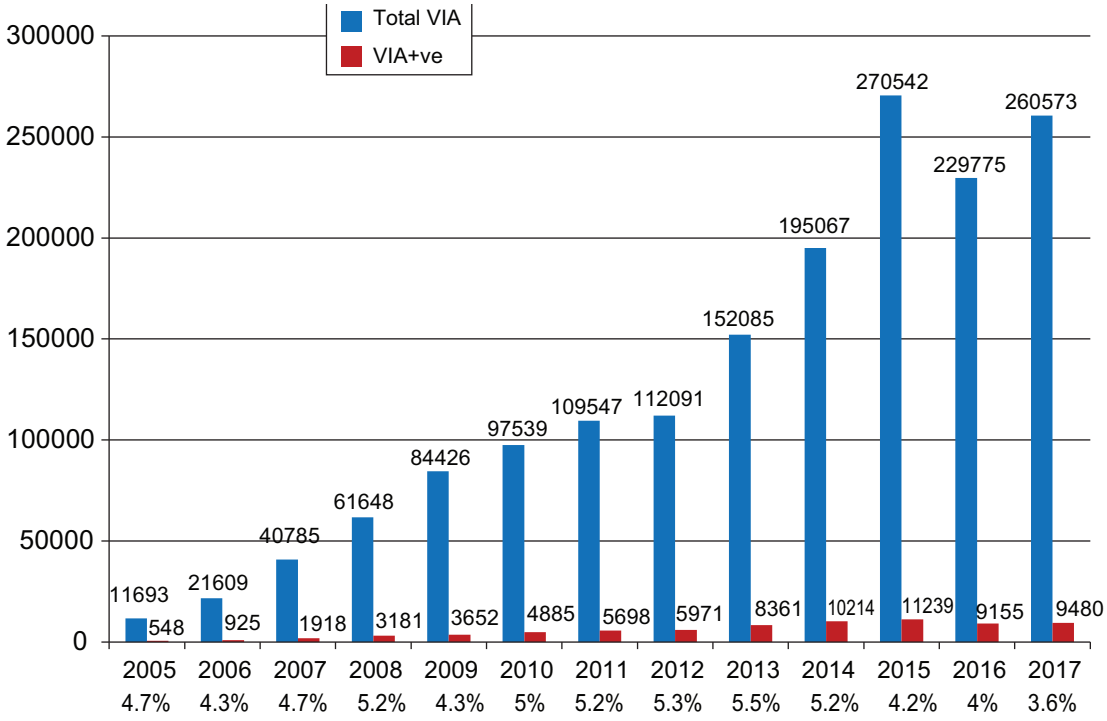

Fig.-3: *Number of VIA tests and VIA+ve results (2005 to 2017) (Total=1647380, +ve 75227 (4.6%)*

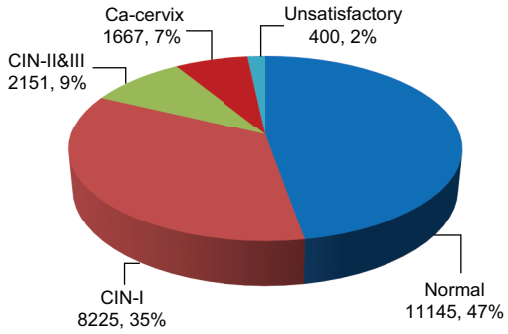

Fig.-4: *Colposcopy Findings of VIA +ve Women Attending BSMMU (JAN 05 to DEC 17, N=23588)*

Table-II

Management of Referred Patients at BSMMU (JAN 05 to DEC 17)

Management of Women	Number
Follow-up after 3 years	10334 (43.80%)
Follow-up after 1 year	3053 (12.90%)
LEEP Biopsy	3332 (14.10%)
Cryotherapy	131 (0.60%)
Thermal Ablation	2428 (10.30%)
Referred to Oncology due to Cancer	1413 (6%)
Failure of treatment and follow-up	2897 (12.30%)
Total	23588 (100.00%)

Treatment of cervical precancer

In Bangladesh, LEEP has acquired acceptability as a commonly used treatment method for CIN and performed as an outpatient procedure under local anaesthesia.[11,14-16]Facilities for LEEP are available at BSMMU and about 15 Government MCH and facilities of thermal ablation is available only at 5 selected MCHs. This methods being used to destroy an abnormal transformation zone and thereby to treat non-invasive cervical lesions since.[17]In Bangladesh thermal ablation has been used recently at several tertiary health facilities and at health camps of many UHCs.[18]Pooled data from Bangladesh, Brazil and India, for women treated for CIN with thermal ablation from 2010 to 2015, and followed up within 6-12 months of treatment, showed the cure after thermal ablation as 88% (475/543) for CIN I, 83% (113/137) for CIN II and 83% (79/95) for CIN III lesions. No serious adverse effect or complications were observed throughout the follow-up period. Thermal ablation is a safe, simple and effective technique to treat selected CIN lesions of any grade.[18]

In Bangladesh, with expansion of the programme, gradually increasing number of women will need treatment for cervical pre-cancer. Treatment by LEEP may not be feasible for large scale practice due to expensive equipments, lack of trained personnel and possible complications. Cryotherapy though is an effective method of treatment, it requires refrigerant gases which is not widely available in Bangladesh and transport cost is high. Therefore, the small, light, comparatively cheap and readily portable thermocoagulator operated by electricity became a feasible alternative to cryotherapy. It can be used generously for treatment of cervical pre-cancer at all level of health care system. Health care providers can be rapidly trained in using thermo coagulator and its maintenance.

Ensuring management of the screen-positive women

All screen-positive women should have adequate counseling, evaluation and treatment at appropriate facilities. In Bangladesh, women with VIA positive report have evaluation using colposcopy through addition of a second visit at a higher referral system and women with suspected CIN of any grade may be treated at the same visit without any histopathological confirmation of the disease. This strategy is called 'see and treat' or 'colposcopy and treat' approach. This approach is convenient for the woman, reduces her anxiety, improves compliance to treatment, and is cost-effective. In Bangladesh, 'see-and-treat' approach for high grade diseases combining colposcopy and LEEP/ thermal ablation has been adopted since the year 2010 to improve compliance to treatment.[15]

Follow-up of treated patients should be continued at all level of facilities by available methods. VIA, colposcopy or HPV DNA test can be used during follow-up on an annual basis for three years. Women tested negative on three consecutive rounds should be returned to the routine screening protocol applicable to the normal population.

CC screening as a part of National Strategy for Cervical Cancer Prevention & Control (2017-2022)[19]

National Strategy for Cervical Cancer Prevention & Control (2017-2022) was developed by specialist group represented by DGHS, DGFP,NICRH,

BSMMU, OGSB, WHO, UNFPA, UNICEF and approved by MOHFW.GOB planned to implement organized population-based cancer screening programme through the public health delivery system to achieve a reasonable coverage of the target population. Married womenbetween 30-60 years of age isoffered VIA-based screening at an interval of 5 years. All screen-positive women should be evaluated by colposcope/mini-colposcope and treated at appropriate facilities. All grades of colposcopy suspected cervical pre-cancers shall be treated following "see andtreat strategy" during the same visit if applicable. Adequate human resources, strengthening of related health infrastructure, electronic data management will be organized. Institution Heads and Gynaecology consultants of all level of health care system should be responsible for implementation, coordination of service delivery and quality assurance of the programme. Common performance indicators are coverage of the target population, screening test positivity, compliance to treatment, detection rates of CIN-II, or worse. Outcome indicators should be monitored on a regular basis to identify gaps and to identify ways of improvement.

Discussion & Policy Implication:

Studies indicate that VIA is at least as sensitive as conventional cytology in detecting high-grade lesions, but its specificity is lower. Table 4 compares the sensitivity and specificity of VIA in detecting CIN II and CIN III and invasive cancer in different low resource countries. Several countries in Asia, Africa and Central America initiated scale-up the VIA based program after gaining some experience from the Pilot Program. The government of Zambia has initiated a large-scale screening program using VIA.[30,16] Bangladesh after successful completion of the pilot programme, scaled up the programme to all the districts, and is now expanding it to the sub-district level. In Bangladesh, colposcopy became an important part of this prevention program both for diagnosis and guiding the treatment.[14,31]Till now most of the districts of Bangladesh have at least six centres for

Cervical cancer screening. However this is predominantly an opportunistic screening programme.[14,16]Recently,GOB is taking active steps to convert it to organized population based CC screening programme with

positive expectation of reducing CC.[19]For convenience and to ensure better compliance, the screening tests should be done close to the residence of the women. Primary and secondary health care facilities are best suited for this purpose. The GOB is therefore continuing scale up the programme towards grass root level. The GOBshould provide particular focus on mechanism of awareness creation, electronic monitoring and mechanism of population coverageas in the national CC control strategies. A broad-based media campaign utilizing print and electronic media should be used to improve the visibility of the programme and enhance participation rates.

Table-III

Accuracy of VIA in Detecting CIN II-III and Invasive Cancer

Author, Year, Country	Number of Participants	Sensitivity(%)	Specificity(%)
Denny et al, 2000, South Africa[20]	2885	67	84
Nessa et al, 2010, Bangladesh[11]	104,098	93.6	58.3
University of Zimbabwe, 1999, Zimbabwe[21]	2148	77	64
Denny et al, 2002, South Africa[22]	2754	70	79
Sankaranarayananet al, 2004, India[23]	54,981	79	86
Braganca et al, 2005, Brazil[24]	809	54	88
Ngoma et al, 2010, Tanzania[25]	10,378	60.6	98.2
Muwonge et al, 2010, Angola[26]	8851	70.7	94.5
Sauvag et al, 2011[27]		80	92
Sankaranarayananet al, 2011[28]		80 (14-95)	92 (14-98)
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