

Cervical Cancer Screening in India- Need, Feasibility & Guidelines for Implementation

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Cervical cancer – a major public health problem in India

Cervical cancer is the most common cause of cancer deaths among women in India. Nearly 130,000 new cases of cervical cancer occur each year in our country and 80,000 women die annually from the disease. Unless preventive measures are taken immediately, the number of deaths from this cancer will rise substantially in the next few decades.

In India due to lack of awareness, non-availability of early detection facilities and various socio-cultural reasons cervical cancers are detected at advanced stages when no curative treatment is possible. The advanced stage at first diagnosis (ranging from 70 – 95% in different centers) accounts for the poor survival of the cervical cancer patients in the country. Cervical cancer deaths occur at a relatively young age when women are at the prime of their life. The personal, social and economic consequences of losing a young mother and young life partner are huge.

Cervical cancer can be prevented by screening

Cancer of uterine cervix develops slowly over 10 to 15 years following oncogenic Human Papilloma Virus infection. The epithelial covering of the cervix (Figure 1) initially undergoes a precancerous change known as Cervical Intra-epithelial Neoplasia (CIN). At this stage the abnormal dysplastic cells are restricted to the epithelium and depending on the thickness of the epithelium involved, the disease is graded to CIN 1, CIN 2 or CIN 3.

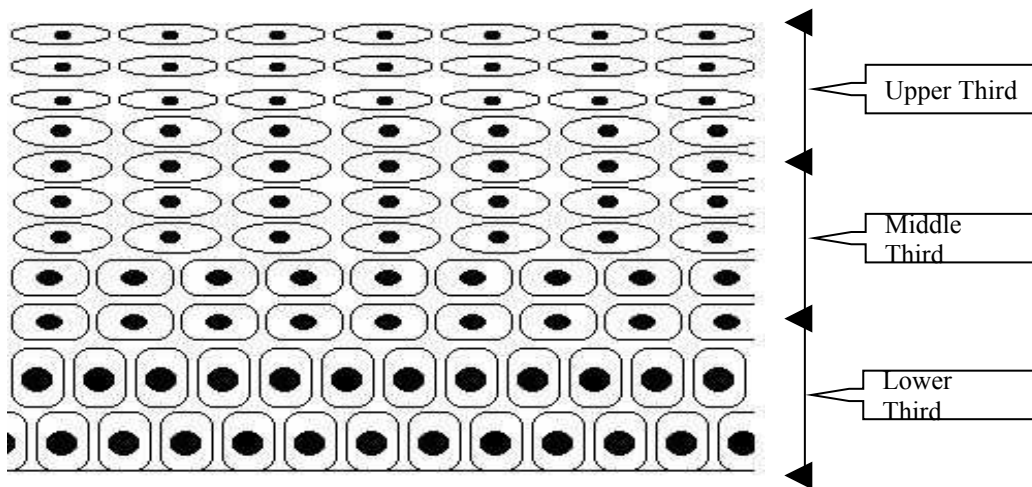


Figure 1. Normal cervical epithelium. Dysplastic cells limited to lower 1/3rd – CIN 1; upto middle 1/3rd – CIN 2; upto upper 1/3rd – CIN 3

CIN 1 is commonly seen in young women and has low potential to transform into malignancy. On the other hand, majority of CIN 2 and CIN 3, if left untreated, will progress to invasive disease. The objective of cervical cancer screening is to apply a simple test on all the women belonging to a certain age group to detect the disease at the CIN 2/3 stage and to treat them. It is well established that detection and treatment of CIN through organized cervical screening programs can reduce the incidence of cervical cancer and the mortality from the disease by 60-80%.

Status of Cervical Cancer Screening in India

In spite of having the highest burden of cervical cancer in the world, our country does not have any organized national cervical cancer screening program. Even in opportunistic set up very few eligible women are advised to undergo screening by the gynecologists. More importantly, very few women have access to screening services since the most widely used screening test, Pap smear cytology, requires a functioning laboratory that is difficult to set up beyond the big cities. Pap smear cytology as a screening test has the following deficiencies in our set up: the sensitivity is low; there is shortage of trained cyto-technicians/pathologists to interpret the slides; quality of smears is often poor leading to

large number of inadequate or ‘inflammatory’ smears; standard Bethesda system of reporting is not followed and the test is expensive for a large scale program. Traditionally the gynecologists in India advise Pap smear only to those women suspected to have cervical cancer either because of their symptoms or due to the unhealthy appearance of the cervix. This is the wrong indication for a screening test like Pap smear, since these women should be referred for a diagnostic test which is colposcopy/biopsy. Screening test should be advised to all asymptomatic and apparently healthy women within the target age. Another major shortcoming of cervical cancer screening activity in our country is the absence of linkage between screening and colposcopy services. In spite of practicing cervical cytology for decades, the colposcopy services and facilities for treating cervical precancer are non-existent or poorly developed in most centers. There is a huge gap between the knowledge and the practice among the gynecologists resulting in inappropriate management and follow up of the cytologically abnormal women.

The recently launched **National Program for Prevention & Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke** (NPCDCS, Ministry of Health & FW, Government of India) has among its major objectives cervical cancer control through opportunistic screening of women above 30 years. The framework of cervical cancer screening under this program is discussed below.

Who should be screened and how frequently?

At the precancer stage the women will not have any complaints and only the screening tests can detect the disease. So the screening test is done on apparently normal women irrespective of whether they have any symptoms or not. Cervical cancer is rare before the age of 30 years. Screening women at a younger age detects many CIN 1 lesions that will never develop into cancer. Unnecessary treatment of these abnormalities causes inconvenience to the women and reduces the cost-effectiveness of the program. The incidence of cervical precancer is considerably reduced after 60 years of age. Best utilization of the resources is possible if screening is limited to the age group at which there is maximum possibility of detecting the high grade precancer lesions (CIN 2 and 3). An Indian group of experts recommended that the ideal age for screening should be **30 to 59 years**.

Screening women at frequent intervals puts a heavy burden on the limited manpower and financial resources. It is recommended that countries like India with limited resources should screen women **every 5 years**. Achieving a good coverage (more than 70%) of the target women determines the success of the screening program rather than the frequency of test.

Which screening test should be used?

An ideal screening test would be one that is simple, painless, can be done rapidly on a large number of individuals, low cost and able to detect the disease accurately. Till date Pap smear (cytology) has been used sparingly in opportunistic setting as a detection test rather than a screening test in India. As discussed earlier, Pap smear has certain drawbacks that limit its usefulness, specially in the medium resource settings of India.

Visual Inspection after Application of Acetic Acid (VIA) has been proved to be a moderately sensitive test that is feasible to be implemented in most health infrastructural situations in India. Many of the low/medium resource countries like Bangladesh, Thailand and Peru etc. are successfully implementing cervical cancer control programs using VIA as the screening test. Large demonstration cervical cancer screening programs using VIA are presently ongoing in some of the rural districts of Tamilnadu, Maharashtra, Kerala, West Bengal and Gujrat. VIA is the only option at present to set up screening facilities at the primary health care level in the districts of our country.

Detection of oncogenic HPV by Hybrid Capture 2 method has been found to be very sensitive and reasonably specific when used to screen women over 30 years of age. Unlike cytology or VIA, HPV test is objective and does not depend on the competence of the performer. The high cost and requirement of laboratory infrastructure preclude the use of the test in large scale program. A rapid and low cost HPV test, likely to be available in the near future, will be more suitable to be inducted in the screening program of our country.

Pap smear cytology can be used in places where well quality controlled laboratory facilities and trained cytopathologists are available, like in metro cities.

Procedure of Visual inspection after application of acetic acid (VIA)

VIA involves naked eye examination (without magnification) of the uterine cervix after application of freshly prepared 3-5% acetic acid (vinegar), under a good light source. VIA is considered positive if there is a distinct, opaque aceto-white area with well defined margin close to the squamo-columnar junction in the transformation zone. A growth or ulcer on cervix is also considered positive for VIA.

Advantages of VIA in Programmatic context:

- Can be performed at Primary Health Centers, District Hospitals
- Paramedical staff (nurses, female health workers) and non-specialist doctors can be trained to do the test
- The procedure is simple and the test-providers can be trained through a five day course
- The equipment cost is nominal and the consumables can be made available very easily
- The test result is available immediately as there is no samples to be sent to any laboratory
- VIA has been proved to be more sensitive than cytology in India for detection of cervical precancers is also cost-effective

Who should perform the tests and where?

For the convenience of the women and to ensure better compliance, the cervical screening tests should be done in places close to their places of residence. Primary health centers and district hospitals are best suited for this purpose. However, if health centers are too far off from a particular locality, special clinics (screening camps) can be set up on temporary basis at a suitable space in the village (eg. primary school).

The screening test can be done by the nurses, female health workers or the physicians at the primary health care level. They require training before the screening program is started. Gynecologists can offer the test to women who consult them for various reasons.

Evaluation of the women with abnormal VIA tests

Being positive on screening test by itself does not mean that the woman is having disease. All women with positive test results should have colposcopy and biopsy should be

obtained if any abnormality is suspected on colposcopy. Colposcopy and biopsy can be arranged at the district hospital or similar set ups.

Management of cervical pre-cancers

Decision to treat the woman is made usually on the basis of the biopsy reports. Sometimes the clinician may decide to treat on the basis of colposcopy diagnosis at the same sitting. This 'see and treat' strategy is convenient to the women and cost-effective for the program. In VIA positive women screening, colposcopy and treatment can be completed in a single visit.

All cases of CIN 2 and CIN 3 should be treated. CIN 1 can be followed up without treatment since most of them will regress spontaneously. If follow up can not be ensured or if the disease is persistent after one year specially in women above 40 years, CIN 1 should be treated.

The pre-cancers are treated either by excising the abnormal area by Loop Electrosurgical Excision Procedure (LEEP) or by destroying the abnormal cells of the lesion by Cryotherapy.

The facility for LEEP can be arranged at the district/sub-divisional hospitals or medical college hospitals where gynecologists and medical officers can be trained to perform the procedure. The surgery is done usually under local anesthesia and the patient does not require hospitalization.

Cryotherapy is a safe, simple and effective technique to treat CIN lesions. The abnormal epithelium is destroyed by cooling them to very low temperature (minus 60-80 degrees) using a cryotherapy equipment. Nitrous-oxide or carbon-di-oxide gas is required for the cooling effect. The advantages of the technique are: no anesthesia or hospitalization is required, can be done at the primary health center, does not require electricity or sophisticated machine, the technique is very easy to learn, complications are very few and is as effective as LEEP in selected cases of CIN 1-3. However, cryotherapy can not be used to treat large lesions or lesions with endocervical extension and a punch biopsy is mandatory before doing the procedure. In situations where colposcopy and biopsy are not available cryotherapy of VIA positive lesions is acceptable. Such paradigm called 'screen and treat' has the risk of over-treatment.

Women detected to have invasive cervical cancer should be referred to cancer centers or medical college hospitals equipped to manage such cases.

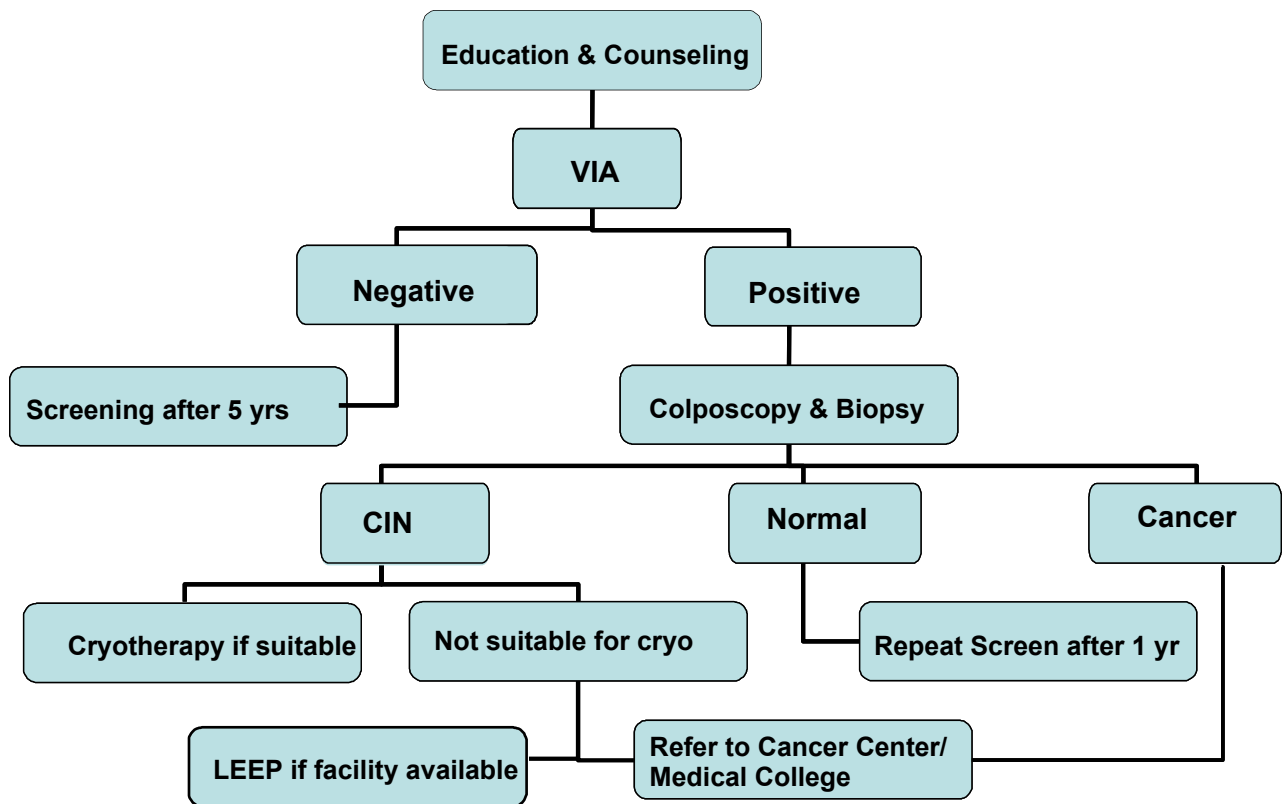


Figure 2: VIA based screening and management protocol flowchart

Monitoring and quality control

Cervical cancers screening needs quality check at every step – screening, colposcopy, treatment and follow up. VIA being an observer dependant test, its performance is influenced by the competency of the test-providers. The test-providers need to be appropriately trained and should be periodically re-trained for the maintenance of quality standards. VIA test positivity varies between 5-10% in Indian population. If appropriately performed, the test should be able to detect CIN2 or worse lesions in 0.5-1.0% of the screened women. There should be high compliance of the screen positive women to colposcopy and of the confirmed CIN 2+ cases to treatment.

Key issues in cervical cancer screening

- An organized screening program where women are systematically invited to participate can significantly reduce cervical cancer incidence and deaths
- The target age group for screening, frequency of screening test, choice of test method are decided based on the existing infrastructure, level of expertise of the providers, priority of cervical screening among other health issues and available financial resources
- A new program in India should aim to screen women in the age group of 30 – 59 years every 5 years in an opportunistic setting to start with
- VIA will be used as the screening test. Pap smear cytology can be used wherever feasible. HPV test will be considered when a low cost version is available
- Screening should be linked to arrangement for diagnostic test (colposcopy and biopsy) and facilities for treatment
- Appropriate training of all levels of health care providers should be arranged along with periodic refresher training.
- Periodic monitoring, communication between different levels of health care systems and meticulous attention to maintain quality assurance at each level of service are the most important aspects to make the program successful.