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Original Research Article

A study of cytology and colposcopy in VIA (visual inspection of cervix with 5% acetic acid) positive women

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ABSTRACT

Background: Cervical cancer is the most common cancer among Indian women. Cervical cancer is preventable in pre-invasive state when effective programmes are implemented to detect and treat its precursor lesions. "Single Visit" screen and treat strategy that uses VIA and colposcopy alone that eliminates the need for repeated visits due to delays in diagnostic results, will be highly attractive in terms of cost effectiveness and compliance to treatment, which is crucial to bring down the incidence and mortality due to cervical cancer. The present study evaluates the performance of colposcopy vs conventional cytology in estimating the presence and grade of cervical disease against the reference standard of histopathology as a secondary test modality to triage women found positive on primary screening by visual inspection with 5% acetic acid (VIA).
Methods: This is a retrospective study carried out on 50 women aged between 18-50 years who tested positive on VIA between August 2013 to November 2015. Data were entered in the institution using standard computer software [EPIINFO software]. Diagnostic accuracy for single test was calculated using 2*2 tables and standard formulae.
Results: The diagnostic accuracy of Pap smear was found to be 77% and that of Colposcopy was 87%. The accuracy of colposcopy was higher than that of Pap smear.
Conclusions: Invasive cervical cancer is preceded by pre-invasive disease in most women. There is a lag time of 10-20 years before the disease progresses from pre-invasive to invasive disease. Prevention of invasive cancer is by screening, diagnosis and treatment of pre-invasive diseases. Thus, early diagnosis of CIN (cervical intraepithelial neoplasia) in adult women is a desirable goal.

Keywords: Cervix cancer, Colposcopy, Screening, Sensitivity, Specificity

INTRODUCTION

Globally, in the year 2008, there were an estimated 12.7 million new cancer cases and 7.6 million cancer deaths.[1] Cervical cancer is the third most common cancer among women worldwide, with an estimated 529 000 new cases and 275 000 deaths in 2008. More than 85% of the global burden of cervical cancer cases and 88% of cervical cancer deaths occur in developing countries.[1] Cervical cancer is the most common cancer among Indian women and was estimated to have been responsible for 134 420 new cases and 72 825 deaths in the year 2008.[1] India contributes to 25.4% and 26.5% of the global burden of cervical cancer cases and mortality, respectively. The age-standardized incidence rate and age-standardized mortality rate of cervical cancers are 27.0 and 15.2, respectively, among Indian women. Cervical cancer is responsible for 25.9% of all cancer cases and 23.3% of all cancer deaths among Indian women.[1] The incidence of cervical cancer is 1.5 to 2 times higher in rural area women than urban area. Cervical cancer is preventable in pre-invasive state when effective programmes are

implemented to detect and treat its precursor lesions. Conventional cytology based screening programmes currently are not feasible in India where infrastructures and quality assurance requirements are not readily met. VIA (visual inspection with acetic acid) meets the criteria of good screening test as its sensitivity ranging from 70% to 85% in detecting high grade cervical intraepithelial neoplasia and invasive cancer and specificity ranges from 67% to 85%.[2-6]

The other advantage is patients get result of VIA immediately making it possible to screen and treat women during same visit. So, it's SINGLE VISIT approach. Colposcopy is very useful in detecting the diseases in its pre-invasive form. It also acts as a guide for the selection of biopsy sites from an abnormal area.

Thus, adopting VIA as a primary screening modality in low resource settings, we tried to evaluate the performance of colposcopy and cytology testing as a secondary test modality to triage women found positive on VIA test.

METHODS

This is a retrospective study of 50 patients aged between 18-50 years who tested positive on VIA. This study was carried out between August 2013 to November 2015.VIA was done on patients referred for routine cervical screening and during camp visits. All the patients were thoroughly evaluated by taking detailed history and clinical examination was done.

General examination was done and then per speculum pelvic examination of cervix and vagina done. Women who are tested positive on primary screening by VIA, further underwent diagnostic evaluation by cytology and colposcopy and were subsequently subjected to colposcopic directed biopsies. Data were entered in the institution using a standard computer software [EPIINFO software]. Diagnostic accuracy for single test was calculated using 2*2 tables and standard formulae.

Inclusion criteria

- Women with, abnormal symptoms like profuse vaginal discharge, postcoital bleeding, intermenstrual bleeding.
- No past history of cervical neoplasia.

Exclusion criteria

- Pregnant women, women during post natal period (up to 3 months)
- Those with previous abnormal results from previous screening
- Those with visible mass/lesion without application of VIA on cervix
- Post menopausal women.

RESULTS

It is a retrospective study of 50 VIA positive cases in which cytology and colposcopy were studied. Majority of patients (42%) were in 35-45 years of age group and coming from lower socioeconomic class (60%). Most of the patients were multiparous. Discharge per vaginum (76%) was the commonest complain. Majority (36%) of patients accepted permanent sterilization method in which Tubal ligation was done in 32% and vasectomy in 4%.

Table 1: Cervical cytology.

Cytology report	Number of cases (n=50)	%
ASCUS	6	12
ASC-H	5	10
AGC	1	2
LSIL	15	30
HSIL	19	38
Squamous cell CA	4	8

Table 1 shows cervical cytology report in which 12% had ASCUS, 10% had ASC-H, 2% had AGC. LSIL was present in 30% of cases; HSIL was present in 38% of cases and Squamous cell carcinoma in 8% of cases.

Table 2: Colposcopic prediction.

Colposcopic prediction	Number of patients (n=50)	%
Normal	5	10
Infection	3	6
CIN I	10	20
CIN II	15	30
CIN III	9	18
Microinvasion	3	6
Invasion	5	10

Table 2 Colposcopy was done in 50 VIA positive patients.10% had normal colposcopic findings, 6% had infection, 20% had CIN I, 30% had CIN II, 18% had CIN III and 16% patients had invasion.

Table 3: Histopathology report.

Histopathology report	Number of cases (n=50)	%
Negative	7	14
HPV infection	5	10
CIN I	10	20
CIN II	12	24
CIN III	9	18
Invasion	7	14

As shown in Table 3 all 50 patients had undergone colposcopic guided biopsy. Biopsy was negative in 14%

of patients, 12% showed HPV infection, 20% were CIN I, 28% were CIN II and 16% were CIN III.

DISCUSSION

Though cervical cancer can be detected in the earlier treatable stages, the morbidity and mortality due to cervical cancer is not reducing because of the failure of the cervical cancer screening programs especially in the developing world. In developed countries, Pap smear screening has been successful in reducing the incidence and mortality due to invasive cervical cancer. Organized and frequently repeated cytology screening has resulted in a substantial reduction of cervical cancer burden in developed countries. But in low-resource countries where organized cytology-based cervical cancer screening programs cannot be implemented due to financial, technical, and logistic barriers, low-cost technologies, such as the VIA-based approaches have been successfully tested and proposed to address the need to effectively improve and extend screening services in the country.[2-6] The incidence of cervical cancer can be reduced by as much as 80% if the quality, coverage and follow- up of screening methods are of high standard.[2]

With the added advantage of the immediate availability of VIA test result, VIA-positive women can be subjected to further investigative procedures to ensure diagnostic and treatment compliance with a "Single Visit" approach. Diagnostic triage of VIA-positive women by cytology or colposcopy directed biopsy are still not very feasible in low-resource country settings like ours where adequate expertise, facility, and infrastructure are still not available for cytology and histopathology confirmation, outside of the city limits. Also, poor patient compliance for further diagnostic or treatment visits and inadequate patient tracking system creates further barriers in the successful implementation of screening programs. Hence a "Single Visit" screen and treat strategy that uses VIA and colposcopy alone that eliminates the need for repeated visits due to delays in diagnostic results, will be highly attractive in terms of cost effectiveness and compliance to treatment, which is crucial to bring down the incidence and mortality due to cervical cancer.

Table 4: Colposcopic prediction and directed biopsy histology correlation.

Colposcopic prediction	Colposcopic directed Biopsy histology					
n-50	**Negative**	**HPV**	**CIN-1**	**CIN-11**	**CIN-111**	**Invasion**
Normal (5)	3	2	-	-	-	-
Infection (3)	1	1	-	1	-	-
CIN-1 (10)	2	1	7	-	-	-
CIN-11 (15)	1	1	2	8	2	1
CIN-111(9)	-	-	1	1	5	2
Invasion (8)	-	-	-	2	2	4

5 cases were predicted to be negative on colposcopic examination. All of the 5 cases were well correlated within 1 degree. i.e. 3 were negative and 2 were diagnosed as HPV infection according to histology.3 cases were predicted to be HPV infection out of which 2 cases were correlated within one degree i.e. 1 patient had negative, 1 patient had HPV infection and 1 patient had CIN II. 10 cases were predicted to be CIN I on colposcopic examination, out of which 2 were negative, 1 was HPV infection, 7 were CIN I. Hence all cases were within one degree correlation with histology.15 cases were predicted to be CIN II on colposcopic examination, out of which 12 cases were correlated within one degree i.e. 1 patient had negative 1 patient had HPV infection and 2 patients had CIN I, 8 patients had CIN II and 2 had CIN III and 1 had invasion according to histology.

9 cases were predicted to be CIN III on colposcopic examination, out of which 8 were correlated with one-degree correlation. Histology showed 1 was CIN I, 1 was CIN II, 5 were CIN III and 2 were invasion according to histology. 8 cases were predicted to be invasion on colposcopic examination, out of which 2 were CIN II, 2 were CIN III and 4 were invasion according to histology. Hence 6 were correlated with one-degree correlation. It showed that in 87% cases colposcopy and histology were well correlated. Thus, diagnostic accuracy with colposcopy proved to be 87% (Table 5).[9-11]

Table 5: Diagnostic accuracy of colposcopy with other studies.

Study	Diagnostic accuracy (%)
Olaniyan B, Mete Analysis[9]	80.0
Massad LS et al[10]	86.0
Savitha et al[11]	85.0
Present study	87.0

In present study diagnostic accuracy of colposcopy is comparable with other authors as mentioned in above tables. Also, data from Massad and Collins reported that the sensitivity of colposcopy with a threshold of any lesion detected was 89% but fell to 56% when the threshold was raised to a high-grade result. In the same

study, the sensitivity of colposcopy at low thresholds was high (74.5%), but the specificity was lower at 57.5%.[10] The performance and accuracy of colposcopy depends largely on the training, experience, and skills of the colposcopist. Hence, sensitivity and specificity of colposcopy varies widely among studies in different parts of the world.

Table 6: Cytology and colposcopy directed biopsy histology correlation.

Cytology	Colposcopic directed Biopsy					
n-50	**Negative**	**HPV**	**CIN-1**	**CIN-11**	**CIN-111**	**Invasion**
ASCUS-(6)	2	1	2	1	-	-
AGUS-(1)	-	-	-	1	-	-
LSIL-(15)	3	1	5	3	2	1
ASC-H-(5)	2	1	1	1	-	-
HSIL-(19)	-	2	1	6	6	4
Squmous cell carcinoma-(4)	-	-	1	1	1	1

6 patients of ASCUS by cervical cytology showed negative in 2, HPV infection in 1, CIN I in 2, and CIN II in 1 patient by colposcopic directerd biopsy histology.[1] case of AGUS by cytology showed CIN II by colposcopic directed biopsy. Out of 15 cases of LSIL, 3 patient had negative histology, 1 had HPV infection, 5 had CIN I, 3 had CIN II, 2 had CIN III and 1 patient showed invasion by colposcopic directed biopsy. Out of 5 patient of ASC-H by cytology, 2 cases had negative, 1 had HPV infection, 1 had CIN I and 1 had CIN II by histology.

19 patients of HSIL by cytology, in which 2 patients showed HPV infection,1 showed CIN I, 6 showed CIN II, 6 showed CIN III and 4 patient showed invasion.

Out of 4 patient of squamous cell carcinoma by cytology prediction, 1 patient had CIN I, 1 patient had CIN II, 1 patient had CIN III and 1 patient had invasion by colposcopic directed biopsy.

Table 7 showed that there is mild discrepancy in cytology and colposcopic directed biopsy histology so, diagnostic accuracy with cytology in present study is 77%.[7,8,11]

Table 7: Diagnostic accuracy of cytology with other studies.

Study	Diagnostic accuracy (%)
Shalini R et al[7]	81
Pete I et al[8]	73
Savitha et al[11]	82
Present study	77

The present study, however, suffers from the limitation of colposcopy being performed by multiple colposcopists at various levels of expertise, many of them recently trained, presumably in their learning curves during the entire phase of the study. Thus, in spite of the above limitations, our findings suggest that colposcopy shows acceptable sensitivity for a histologic outcome.

Thus colposcopy, which gives immediate results, can be considered as a secondary testing tool to triage women found positive on VIA in settings where cytology and histopathology services are logistically and technically not feasible.

CONCLUSION

Cervical cancer is most common cancer in women in India and developing countries. Invasive cervical cancer is preceded by pre-invasive disease in most women. There is a lag time of 10-20 years before the disease progresses from pre-invasive to invasive disease. Prevention of invasive cancer is by screening, diagnosis and treatment of preinvasive diseases. Thus, early diagnosis of CIN in adult women is a desirable goal. From the results of this study, it is evident that colposcopy and colposcopy guided biopsy is definitely more sensitive and accurate than Pap smear. Colposcopy is a good sensitive test for the detection of CIN and can be considered as a secondary testing tool to triage women found positive on VIA.

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