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**Research Article**

# Epidemiology of preinvasive lesions of the cervix and accuracy of its screening modalities in low resource settings

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## ABSTRACT

**Background:** Cervical cancer is the leading cause of deaths of women due to malignancies in developing countries worldwide. Having a latency period of upto10 years, preinvasive lesions of cervix give us a wide margin for detection and treatment before it becomes cancerous. This is the aim of this study is to establish a pattern of prevalence of these preinvasive lesions and find out correlation with various epidemiological factors and establish best screening modality in low resource settings like ours.
**Methods:** The cases were studied in terms of their epidemiologic characteristics. The diagnostic accuracy of visual inspection with acetic acid (VIA) and cytology was assessed using colposcopy and biopsy as the gold standard, chi-square test applied and power of the screening test calculated.
**Results:** Abnormal cytology (47/226) was mostly found in age group 30-40 29/47 (61.7%), were para 2 to 4 34/47 (72.3%), belonged to class IV-V socioeconomic class 28(59.6%), belonged to rural areas 32/47(68%) were illiterate 29/47(61.7%) were married at a young age 15-17 23/47(49%) and were not using any contraception 22/47(46.8%). The diagnostic accuracy of the screening tests that is VIA and cytology was tested against the gold standard test which was taken as colposcopy and biopsy in our study.
**Conclusions:** VIA is a screening modality suitable for low resource setting like ours along with cytology. It also offers see and treat option for women in rural areas who are usually lost to follow up.

**Keywords:** Cervical intraepithelial neoplasia, Screening, Epidemiology, Risk factors

## INTRODUCTION

Cervical cancer is the leading cause of deaths of women due to malignancies in developing countries worldwide.[1] Having a latency period of upto10 years, preinvasive lesions of cervix gives us a wide margin for detection and treatment before it becomes cancerous.[2] It has been estimated that even after putting in all the resources it's not possible to screen one fourth of the population of women in India.[3] This is the aim of this study to establish a pattern of prevalence of these preinvasive lesions and find out correlation with various epidemiological factors and establish best screening modality in low resource settings like ours.

## METHODS

In this study, patients coming to the OPD of the Gynaecology Department, over a period of three years, (2009-2011) with various complaints like vaginal discharge and post coital bleeding etc. were subjected to en VIA examination (visual inspection with acetic acid), and cytology. Selected cases were subjected to colposcopy and biopsy, which is taken as gold standard in the study. The cases were studied in terms of their epidemiologic characteristics. The diagnostic accuracy of VIA and cytology was assessed using colposcopy and biopsy as the gold standard, chi-square test applied and power of the screening test was calculated.

Inclusion criterions were; sexually active women in reproductive age group, women having suspicious lesions

and women having persistent discharge per vaginum. All patients who had had hysterectomy or were pregnant or had carcinoma cervix were excluded from the study.

## RESULTS

226 cases were subjected to VIA examination, using freshly prepared 5% acetic acid. 105(46.5%) cases were VIA positive. Same no of cases were also subjected to cytological evaluation. Upon cytological evaluation, 21 (9.3%) had a normal cytology, 158(69.9%) were inflammatory, 3(1.3%) had ASCUS, 1(0.4%) had AGUS, 26(11.6%) had LSIL and koilocytic changes, 11(4.9%) had HSIL, and 6 cases (2.6%) had squamous cell carcinoma.

Abnormal cytology (47/226) was mostly found in age group 30-40 29/47 (61.7%), were para 2 to 4 34/47 (72.3%), belonged to class IV-V socioeconomic class 28(59.6%), belonged to rural areas 32/47(68%) were illiterate 29/47(61.7%) were married at a young age 15-17 23/47(49%) and were not using any contraception 22/47(46.8%). The diagnostic accuracy of the screening tests that is VIA and cytology was tested against the gold standard test which was taken as colposcopy and biopsy in our study.

The sensitivity of VIA examination, taking colposcopy and biopsy as the gold standard was found out to be 83.01% and specificity 64.73%. The positive predictive value was 67.64% and negative predictive value was 68.75%. Upon application of chi-square test, the value was found out to be 37.2 and the p-value was <0.001, which was statistically significant.

The sensitivity of cytological examination, using colposcopy and biopsy as the gold standard, was 62.5 % and specificity was 85%.The p-value was significant in this case too, (<0.001).

**Table 1: Association of abnormal cytology and abnormal VIA with high risk factors**

| Risk factors | Normal cytology N=179 | Abnormal cytology N=47 | VIA + N=105 | VIA- N=121 |
|---|---|---|---|---|
| Age in years | | | | |
| 20-30 | 61 (34.1) | 11 (23.4) | 34 (32.4) | 38 (31.4) |
| 30-40 | 74 (41.3) | 29 (61.7) | 44 (42) | 59 (48.8) |
| >40 | 4 (24.6) | 7 (14.9) | 27 (25.7) | 24 (19.8) |
| Parity | | | | |
| P0 | 3 (1.7) | - | 2 (1.9) | 1 (0.8) |
| P1 | 17 (9.5) | 1 (19.1) | 8 (7.6) | 10 (8.2) |
| P2-4 | 73 (40.7) | 34 (72.3) | 60 (57.1) | 47 (38.8) |
| P>or= 5 | 86 (48) | 12 (25.5) | 22 (21) | 76 (62.8) |
| Socioeconomic class | | | | |
| Class I-III | 102 (57) | 19 (40.4) | 43 (41) | 78 (64.4) |
| Class IV-V | 77 (43) | 28 (59.6) | 62 (59) | 43 (35.5) |
| Residence | | | | |
| Rural | 110 (61.5) | 32 (68) | 66 (62.9) | 76 (64.4) |
| Urban | 69 (38.5) | 15 (32) | 39 (37.1) | 45 (37.2) |
| Literacy status | | | | |
| Literate | 74 (41.3) | 18 (32.3) | 54 (51.4) | 38 (31.4) |
| Illiterate | 105 (58.7) | 29 (61.7) | 51 (48.5) | 83 (68.6) |
| Religion | | | | |
| Hindu | 68 (38) | 29 (61.7) | 47 (44.7) | 50 (41.3) |
| Muslim | 111 (62) | 18 (38.3) | 58 (55.2) | 71 (58.7) |
| Age at marraige | | | | |
| 15-17 | 83 (46.4) | 23 (49) | 41 (39) | 65 (53.7) |
| 18-20 | 77 (43) | 17 (34.7) | 50 (47.6) | 44 (36.3) |
| 21-30 | 19 (10.6) | 7 (14.3) | 14 (13.3) | 12 (10) |
| Contraception | | | | |
| No contraception | 35 (19.5) | 22 (46.8) | 24 (22.9) | 33 (27.3) |
| Barrier | 87 (48.6) | 16 (34) | 56 (53.3) | 47 (38.8) |
| IUD | 14 (7.8) | 4 (8.5) | 7 (6.6) | 11 (9) |
| Ligation | 18 (10) | 3 (6.4) | 8 (7.6) | 13 (10.7) |
| OCP | 25 (14) | 2 (4.3) | 10 (10) | 17 (14) |

## DISCUSSION

Abnormal cytology (47/226) was mostly found in age group 30-40 29/47 (61.7%), were para 2 to 4 34/47 (72.3%), belonged to class IV-V socioeconomic class 28(59.6%), belonged to rural areas 32/47(68%) were illiterate 29/47(61.7%) were married at a young age 15-17 23/47(49%) and were not using any contraception 22/47(46.8%). The diagnostic accuracy of the screening tests that is, in our study most common presenting complaint was abnormal discharge, similar to a study conducted by Aggarwal et al 2006.[4] VIA and cytology was tested against the gold standard test which was taken as colposcopy and biopsy in our study.

Appleby et al 2007, showed that use of oral contraceptive pills was associated with increased risk of cervical cancer, but in our study maximum cases were not using any contraception at all.[5]

Poor socioeconomic condition has been found to be associated with cancer as in poor living conditions by Harris et al 1998 and poor literacy rate as by Lindau et al 2002.[6,7] A study of Stone et al 1995 showed early age of sexual debut and a large number of sexual partners were associated with increased cervical cancer.[8]

The sensitivity of cytological examination, using colposcopy and biopsy as the gold standard, was 62.5% and specificity was 62.5%. Nanda et al 2000 showed a sensitivity of 68% and specificity of 75% of cytological examination.[9]

The sensitivity of VIA examination, taking colposcopy and biopsy as the gold standard was found out to be 83.01% and specificity 64.73%. The positive predictive value was 67.64% and negative predictive value was 68.75%. Upon application of chi-square test the value was found out to be 37.2 and the p-value was <0.001, which was statistically significant. A study conducted by Ardhan et al 2011 showed sensitivity of 82.14%, and specificity of 50%.[10] The sensitivity was almost comparable our study.

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