

STUDY OF EFFICACY OF VISUAL INSPECTION WITH DILUTED ACETIC ACID AND LUGOL'S IODINE FOR EARLY DETECTION OF CERVICAL CANCERAcharya Veena¹, Naruka Nisha², Joshi Leena³, Meena Ashok⁴, Mathur Abha⁵**HOW TO CITE THIS ARTICLE:**

Acharya Veena, Naruka Nisha, Joshi Leena, Meena Ashok, Mathur Abha. "Study of Efficacy of Visual Inspection with Diluted Acetic Acid and Lugol's Iodine for Early Detection of Cervical Cancer". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 28, July 14; Page: 7905-7910, DOI: 10.14260/jemds/2014/2989

ABSTRACT: AIMS AND OBJECTIVE: Screening of women, of 30-50 years age, by doing VIA and VILI, Colposcopy and Treatment by Cryotherapy and LEEP in Histopathological positive cases in Mahatma Gandhi Medical College and Hospital, Jaipur from 2010 to 2013. **METHODS:** Study was hospital based Total number of women screened were 834, who were attending regular outdoor in Mahatma Gandhi Medical Hospital for any gynecological complaints. Age group was 30-50years; women were not pregnant and not menstruating. Out of 834 subjects, 21 subjects refused for VIA and Colposcopy, only VILI was done in these cases. **RESULTS:** This study was carried out during Jan 2010 to March 2013. A total of 834 women were recruited, 21 women refused for VIA and colposcopy. Out of 834 cases, in 4 cases SCJ (Squamo Columnar Junction) not seen, in 98% women SCJ seen fully. Out of 834, 225 (27%) cases were VILI positive and out of 813, 184 cases i.e. 22.6% were Via positive Biopsy was taken in 223 cases where HSIL reported in 3 cases (1.4%) and invasive squamous cell carcinoma in 4 cases. Out of 834 women, cryotherapy was done in 61 cases and LEEP in 15 cases, conization in 1andsurgery in 3 cases. **CONCLUSION:** Visual screening has been taken as most effective method as compared to cytology or HPV testing. It is cheap, outdoor procedure, can be done by paramedical staff and can be done in large scale.

KEYWORDS: Visual inspection, acetic acid, lugol's Iodine, VIA, VILI, sensitivity, specificity, cervical neoplasia, screening.

INTRODUCTION: Cancer of Cervix Uteri is the most common cancer among women in developing world, and 60% of all cases occur in the countries of Sub-Saharan Africa, South Asia and Latin America¹. Cervical cytology screening programme in developed countries has reduced disease burden to some extent. Screening programme exist in few countries where to some extent reduction in mortality from cervical cancer has been observed^{2,3}. Success of screening program by cytology mostly depends upon skilled personnel, good quality cytology smears, good laboratory facility and good organization which are a big hindrance in screening program. In developing countries like in India with poor resource setting, simple and cheap methods like VIA, VILI are effective methods of screening women for prevention of cervical cancer.

Number of cross sectional studies conducted in India and Africa by IARC (International Agency for Research on Cancers) in collaboration with national institution to know the accuracy of VIA and VILI to detect HSIL (high grade cervical intra epithelial neoplasia)⁴.

STUDY DESIGN: During the years 2010 to 2013, the study of cervical cancer screening was conducted in Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur (Rajasthan). Simple protocol was used.

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All women participating in the study were tested with index screening tests VIA and VILI and reference investigation, namely colposcopy with or without biopsy, biopsies were taken in women with abnormal or suspicious finding on colposcopy. All the testing were done independently and blinded. True positive disease was defined as HSIL a gold standard was histopathology.

PARTICIPANTS: The study participants were healthy, ambulant, asymptomatic women who were aged 30-50 years with an intact uterus with no past history of cervical neoplasia. Women who had non satisfactory colposcopy with no biopsy were excluded from the study. Women attended open access screening program, a female health worker explained the purpose of the study. A printed consent form was read in front of participants and duly signed by them. After the interview, screening tests and diagnostic investigation were carried out.

TEST METHODS: VIA and VILI were performed by trained female health workers under supervision of doctor. Health workers and medical professionals were given a training of VIA and VILI and colposcopy using lectures, discussions, review of photographs of normal and abnormal cervix.⁵

In outdoor, each participant was tested with VIA followed by colposcopy and VILI was placed in a modified lithotomy position on an examination table. Cervix was exposed by inserting a bivalve speculum. After application of 4% acetic acid to cervix, it is examined after a minute using a halogen lamp light source and then colposcopy is done. In VIA positive cases, VILI was done and punch biopsy taken from abnormal area and sent for histopathological exam.

Final diagnosis was based on histopathology i.e. it was taken as gold standard to find out true disease. However when histology is not available or is not conclusive colposcopy diagnosis may be taken as the true disease, for cervical neoplasia, colposcopy and directed biopsy are commonly used and are accepted reference standard ("gold standard") investigations.^{6, 7, 8} If histology is not available then colposcopic diagnosis maybe accepted as true disease.^{7, 8}

STATISTICAL METHODS: HSIL were considered as true positive disease to calculate sensitivity, specificity and predictive values of the screening tests in order to obtain conservative estimates of accuracy and to avoid spectrum bias⁹.

RESULTS:

PARTICIPANTS: My study was carried out during Jan 2010 to March 2013. A total of 834 women who were attending Gynae outdoor were recruited, out of 834 women, 21 women refused for VIA and Colposcopy and only VILI was done in these cases.

TABLE 1

Squamocolumnar Junction	Cases number	%
1. Yes, fully	817	98%
2. Yes, Partially	13	1.6%
3. No	4	0.5%
Total	834	100%
Squamocolumnar Junction Frequency:		

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As the Table1 suggests, out of 834, squamocolumnar junction was fully visualized in 817 women i.e. 98%. In 4 women, squamocolumnar junction was not fully visualized and in 13 women SCJ was partially visualized.

TABLE 2 (screening tests with VIA and VILI)

VILI Results	Cases Number	%
1. Negative	609	73%
2. Positive	225	27%
3. Invasive cancer	0	0%
TOTAL	834	100%

Findings of VILI Results

VIA Results	Cases Number	%
1. Negative	629	77.4%
2. Positive	184	22.6%
3. Unknown	0	0%
TOTAL	813	100%

Findings of VIA Results

VIA was positive in 184 women i.e. 22.6% and VILI was positive in 225 women i.e. 27%. Test positivity was related to visibility of SCJ, age, menstrual status, education, marital status and Pregnancies.

Out of VIA positive 176 cases, 124 were normal 70%

22 had low grade lesions i.e. 12% and 6 have HSIL i.e. 3%

Among women tested with VILI out of 163 VILI positive women, normal were 128 i.e. 78%, 18 had low grade lesions i.e. 11% and 5 have HSIL i.e. 3%.

Women were treated after results of Histopathology because it was Gold standard test. No adverse reaction such as bleeding as allergic reaction was noted in the study.

TABLE 3: histopathology of VIA test

HISTO	1. Negative	2. Positive	3. Invasive cancer	Total	%
0. Not done	0	0		0	0%
1. Inflammation / chronic cervicitis	4	15		19	8.5%
2. Squamous metaplasia	23	87		110	49.5%
3. HPV infection	4	18		22	10%
4. Atypia	0	4		4	2%
5. CIN 1	2	22		24	11%
6. CIN 2	0	2		2	0.9%
7. CIN 3	0	1		1	0.45%
8. Early invasive carcinoma	0	2		2	0.9%
9. Invasive squamous cell carcinoma	1	1		2	0.9%

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10. Invasive adenocarcinoma	0	0		0	0%
99. Other	12	25		37	16.6%
Total	46	176		223	100.0%

Histopathology x findings of VIA:

Sensitivity	86%
Specificity	78%
Positive predictive value (PPV)	3.2%
Negative predictive value (NPV)	99.8%

Sensitivity of Via in detecting HSIL was 86% and specificity was 78%, positive predictive value PPV 3.2% and negative predictive value NPV – 99.8%

TABLE 4: histopathology of VILI test

HISTO	1. Negative	2. Positive	3. Invasive cancer	Total	%
0. Not done	0	0		0	0%
1. Inflammation / chronic cervicitis	4	15		19	8.5%
2. Squamous metaplasia	26	84		110	49.5%
3. HPV infection	6	16		22	10%
4. Atypia	1	3		4	2%
5. CIN 1	6	18		24	11%
6. CIN 2	0	2		2	0.9%
7. CIN 3	0	1		1	0.45%
8. Early invasive carcinoma	0	2		2	0.9%
9. Invasive squamous cell carcinoma	2	0		2	0.9%
10. Invasive adenocarcinoma	0	0		0	0%
99. Other	15	22		37	16.6%
Total	60	163		223	100.0%

Histopathology x findings of VILI

Sensitivity	:	71.43%
Specificity	:	73.4%
Positive predictive value (PPV)	:	2.25%
Negative predictive value (NPV)	:	99.8%

Sensitivity of VILI in detecting HSIL were 71.43% specificity- 73.4%, PPV – 2.25%, NPV- 99.8%

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DISCUSSION: A screening test is suitable only because of its simplicity and safety and its accuracy which is measured by sensitivity and specificity¹⁰.

A suitable reference test should distinguish the subjects who are truly positive from those who are negative. A study will suffer from “verification bias” if the reference investigation is restricted to test positive individuals only to a sample of test negative persons. Such bias is known to inflate sensitivity estimates and maybe avoided if all individuals receive the reference investigation, irrespective of the test results¹¹. Previous cross-sectional studies^{7, 12-20} have reported on the accuracy of VIA but all except 2 studies^{7, 13} suffered from verification bias. There are no published results for VILI in recent decades but VILI had significantly higher sensitivity and specificity than those reported for VIA in the Zimbabwe⁷ and Chinese^{13, 14} studies.

The characteristics of VIA as a screening test have been established by many cross sectional studies, VILI is used to detect color pattern by health workers.

Though sensitivity and specificity of VIA and VILI have not much far difference but if compared VIA is more specific, cheap and simple procedure. It can be done in outdoor by paramedical staff also and can be used for large population.

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