

## COMPARATIVE ANALYSIS OF CERVICAL BIOPSY WITH VISUAL INSPECTION WITH ACETIC ACID (VIA) TEST IN EARLY DETECTION OF PREMALIGNANT AND MALIGNANT LESIONS OF THE CERVIX AT A TERTIARY CARE HOSPITAL

### Histopathology

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### ABSTRACT

**Background:** Cervical cancer remains a major public health problem in developing countries. Visual inspection with acetic acid (VIA) is a simple and cost-effective screening tool. **Aim:** To evaluate the diagnostic accuracy of VIA in detecting premalignant and malignant cervical lesions using histopathology as the gold standard. **Methods:** A prospective study was conducted on reproductive age group women presenting with cervical lesions at a tertiary care hospital. All patients underwent VIA screening followed by cervical biopsy. Histopathological findings were correlated with VIA results. **Results:** Majority of lesions were inflammatory. Premalignant lesions (CIN) and invasive carcinomas were identified predominantly in higher age groups. VIA showed good sensitivity but moderate specificity in detecting cervical lesions. **Conclusion:** VIA is an effective screening tool for early detection of cervical lesions, especially in low-resource settings, but histopathology remains the gold standard.

### KEYWORDS

VIA, Cervical Biopsy, CIN, Cervical Cancer, Screening

### INTRODUCTION

Carcinoma of the cervix remains a major public health problem, particularly in developing countries, where it accounts for a significant proportion of cancer-related morbidity and mortality among women<sup>1</sup>. In India, it constitutes one of the leading gynecological malignancies, with a high incidence in women of low socioeconomic status due to lack of effective screening programs<sup>2</sup>. Most cervical cancers arise from the transformation zone at the squamocolumnar junction, where persistent infection with oncogenic agents leads to a spectrum of lesions ranging from inflammation to premalignant changes and invasive carcinoma<sup>3,4</sup>.

Visual inspection with acetic acid (VIA) is a simple, inexpensive, and easily applicable screening method that allows immediate detection of precancerous lesions without the need for laboratory infrastructure. Although histopathological examination of cervical biopsy remains the gold standard for diagnosis, VIA serves as a valuable screening tool, especially in resource-limited settings<sup>5</sup>. The present study aims to evaluate the effectiveness of VIA in detecting premalignant and malignant cervical lesions and to correlate its findings with histopathological diagnosis.

### AIM:

To collate the accuracy of visual inspection of the cervix with acetic acid (VIA) in the early detection of premalignant and malignant lesions of the cervix, and standardize it with histopathology, a gold standard screening tool.

### OBJECTIVES:

1. To study the clinical profile of patients with cervical lesions
2. To interpret the result of VIA test
3. To examine histopathological features of VIA-positive cervical biopsy specimens
4. To compare findings of VIA test and cervical biopsy

### Inclusion Criteria:

- Women of reproductive age group
- VIA- positive and VIA- negative patients

### Exclusion Criteria:

- Pregnant women
- Post-menopausal women
- Patients with bleeding P/V and active infection at the time of examination
- Patients who are already diagnosed cervical cancer.

**Statistical analysis:** Sensitivity, specificity, PPV, NPV calculated

### RESULT:

**Table 1: Histopathological distribution of Lesions of Cervix**

| HISTOPATHOLOGICAL LESIONS | NUMBER OF CASES | PERCENTAGE % |
|---------------------------|-----------------|--------------|
| Inflammatory              | 23              | 50%          |
| Benign                    | 3               | 6.52%        |
| Premalignant              | 9               | 19.57%       |
| Malignant                 | 11              | 23.91%       |
| Total                     | 46              |              |

**Table 2: Distribution of various Cervical lesions in different age group**

| Age group   | Inflammatory | Benign | Premalignant | Malignant | Grand Total |
|-------------|--------------|--------|--------------|-----------|-------------|
| 25-29       | 5            | 0      | 0            | 0         | 5           |
| 30-34       | 2            | 2      | 1            | 3         | 8           |
| 35-39       | 5            | 1      | 0            | 0         | 6           |
| 40-44       | 5            | 0      | 2            | 2         | 9           |
| 45-49       | 4            | 0      | 4            | 3         | 11          |
| 50-54       | 2            | 0      | 1            | 2         | 5           |
| 55-60       | 0            | 0      | 1            | 1         | 2           |
| Grand Total | 23           | 3      | 9            | 11        | 46          |

**Table 3: Histopathological diagnosis in VIA screening**

| Histopathologic al diagnosis | Inflamm atory | Benign | Premalign ant | Malignant | Grand Total |
|------------------------------|---------------|--------|---------------|-----------|-------------|
| VIA- Negative                | 14            | 1      | 1             | 3         | 19          |
| VIA- Positive                | 9             | 2      | 8             | 8         | 27          |
| Grand Total                  | 23            | 3      | 9             | 11        | 46          |

**Table 4: Sensitivity & Specificity of VIA with Cervical Biopsy Report**

| Variability               | Values |
|---------------------------|--------|
| Sensitivity               | 80%    |
| Specificity               | 57.7%  |
| Positive Predictive Value | 59.3%  |
| Negative Predictive Value | 78.9%  |
| Diagnostic Accuracy       | 67.39% |

**Table 5: Comparison of premalignant lesion of cervix and VIA result**

| VIA result    | CIN-1 | CIN-3 | Total |
|---------------|-------|-------|-------|
| VIA- Negative | 0     | 1     | 1     |
| VIA- Positive | 4     | 4     | 8     |

|       |   |   |   |
|-------|---|---|---|
| Total | 4 | 5 | 9 |
|-------|---|---|---|

**Table 6: Distribution of Invasive carcinoma on histopathology**

| CERVICAL MALIGNANCY ON HISTOPATHOLOGY | NUMBER OF CASES | PERCENTAGE % |
|---------------------------------------|-----------------|--------------|
| Squamous cell carcinoma               | 9               | 81.82%       |
| Adenosquamous carcinoma               | 1               | 9.09%        |
| Endometrioid carcinoma                | 1               | 9.09%        |
| TOTAL                                 | 11              | 100%         |

**Table 7: Relation of parity with VIA screening along with premalignant and malignant lesions**

| Parity | Premalignant |              | Total | Malignant    |              | Total | Grand Total Premalignant + Malignant | Total Cases according to parity |
|--------|--------------|--------------|-------|--------------|--------------|-------|--------------------------------------|---------------------------------|
|        | VIA-Negative | VIA-Positive |       | VIA-Negative | VIA-Positive |       |                                      |                                 |
| Nulli  | 0            | 0            | 1     | 0            | 0            | 0     | 1(100%)                              | 1                               |
| P1     | 0            | 0            | 0     | 0            | 0            | 0     | 0(0%)                                | 2                               |
| P2     | 0            | 1            | 1     | 0            | 3            | 3     | 4(25%)                               | 16                              |
| P3     | 1            | 3            | 4     | 2            | 4            | 6     | 10(52.63%)                           | 19                              |
| P4     | 0            | 0            | 0     | 1            | 0            | 1     | 1(100%)                              | 1                               |
| P5     | 0            | 1            | 1     | 0            | 0            | 0     | 1(25%)                               | 4                               |
| P6     | 0            | 2            | 2     | 0            | 1            | 1     | 3(100%)                              | 3                               |
| Total  | 1            | 8            | 9     | 3            | 8            | 11    | 20                                   | 46                              |

**DISCUSSION:**

A total of 46 cases were included in the study.

**Histopathological Distribution**

Inflammatory lesions were the most common, accounting for 50% (23/46) cases, followed by malignant lesions 23.91% (11/46), premalignant lesions 19.57% (9/46), and benign lesions 6.52% (3/46).

**Age-wise Distribution**

The majority of lesions were observed in the 40–49 years age group, with peak occurrence of premalignant and malignant lesions in 45–49 years. Malignant lesions were more frequent in higher age groups (>40 years), whereas inflammatory lesions were distributed across all age groups.

**Correlation of VIA with Histopathology**

Out of 46 cases, 27 were VIA-positive and 19 were VIA-negative.

Among VIA-positive cases, 8 premalignant and 8 malignant lesions were detected.

Among VIA-negative cases, 1 premalignant and 3 malignant cases were missed.

**Diagnostic Accuracy of VIA**

VIA demonstrated:

Sensitivity: 80%, Specificity: 57.7%, Positive Predictive Value (PPV): 59.3%, Negative Predictive Value (NPV): 78.9%

Overall Diagnostic Accuracy: 67.39%

Premalignant Lesions (CIN)- Out of 9 premalignant cases:

CIN 1: 4 cases

CIN 3: 5 cases

Majority (8/9 cases) were VIA-positive.

**Malignant Lesions**

Among 11 malignant cases:

Squamous cell carcinoma: 81.82% (9/11)

Adenosquamous carcinoma: 9.09% (1/11)

Endometrioid carcinoma: 9.09% (1/11)

**Parity Association**

Higher parity ( $\geq P3$ ) showed increased association with premalignant and malignant lesions. Maximum cases (52.63%) were seen in parity 3 women.

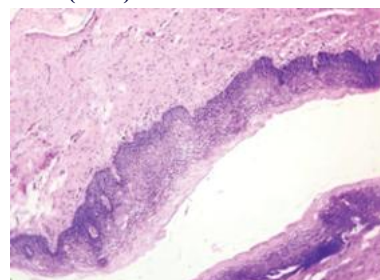
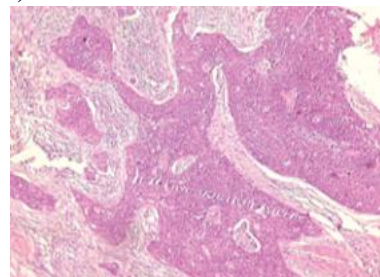
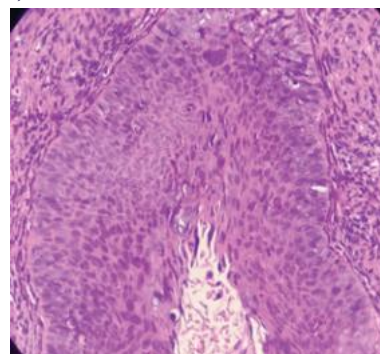
**CONCLUSION**

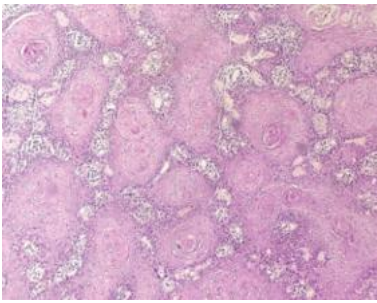
VIA is a simple, cost-effective, and easily applicable screening tool for the early detection of premalignant and malignant cervical lesions, particularly in low-resource settings. In the present study, VIA demonstrated high sensitivity (80%), making it suitable for screening purposes; however, its moderate specificity (57.7%) indicates a possibility of false-positive results.

The majority of cervical lesions were inflammatory, while

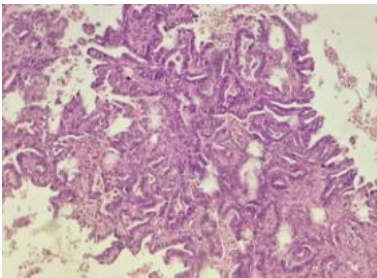
pre-malignant and malignant lesions were more common in women above 40 years of age and in those with higher parity. Squamous cell carcinoma was the most common malignancy observed.

Although VIA is effective for screening, histopathological examination remains the gold standard for definitive diagnosis. Therefore, VIA can be used as an initial screening modality, with biopsy confirmation for accurate diagnosis and management.

**Figures (Include from Thesis)****VIA positive cervix****Fig.1 – Acetowhite area in suspected case****Chronic cervicitis (H&E)****Fig.2- Chronic cervicitis showing chronic inflammatory cell infiltrate in cervical stroma (H&E,  $\times 10$ )****CIN 3 (H&E)****Fig.3 - Low-power view showing full-thickness dysplasia of cervical squamous epithelium with loss of maturation and intact basement membrane (H&E,  $\times 10$ ).****CIN 3 (H&E)****Fig.4 - Full-thickness squamous epithelial dysplasia showing loss of maturation, nuclear hyperchromasia, pleomorphism, and increased mitotic activity (H&E,  $\times 100$ ).**

**Squamous cell carcinoma**

**Fig.5- Low-power view showing infiltrating nests of malignant squamous cells with keratin pearl formation in cervical stroma (H&E, ×10).**

**Well differentiated Endometrioid Adenocarcinoma**

**Fig. 6- Low-power view showing closely packed atypical endometrioid glands with back-to-back arrangement and minimal intervening stroma (H&E, ×10).**

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