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Visual Inspection with Acetic Acid and Lugol's Iodine for Early Detection of Cervical Lesions with Colposcopy and Histopathology Correlation

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Abstract: ***Cervical cancer remains a major public health concern in developing countries due to inadequate screening coverage. Visual inspection with acetic acid (VIA) and visual inspection with Lugol's iodine (VILI) are simple, low-cost screening methods suitable for low-resource settings. This study aimed to evaluate the efficacy of VIA and VILI in detecting premalignant and malignant cervical lesions and to correlate findings with colposcopy and histopathology. A prospective cross-sectional study was conducted among 100 women attending the gynecology outpatient department. All participants underwent VIA and VILI followed by colposcopy. Cervical biopsy was performed in women with abnormal findings, and histopathology was considered the gold standard. Histopathology confirmed cervical lesions in 10% of cases. VIA and VILI demonstrated a sensitivity of 70%, specificity of 100%, positive predictive value of 100%, negative predictive value of 96.8%, and diagnostic accuracy of 97%. Colposcopy showed complete correlation with histopathology. VIA and VILI are effective screening tools with high specificity and acceptable sensitivity for early detection of cervical lesions.***

Keywords: Cervical cancer screening; VIA; VILI; Colposcopy; Cervical intraepithelial neoplasia

1. Introduction

Cervical cancer is the second most common malignancy among women in developing countries and continues to contribute significantly to morbidity and mortality. The prolonged pre-invasive phase of cervical cancer offers a critical window for early detection and intervention. While cytology-based screening programs have reduced disease burden in developed countries, their implementation in low-resource settings is limited by infrastructure, cost, and manpower constraints. Visual inspection techniques such as VIA and VILI provide inexpensive, simple, and immediate screening alternatives.

2. Literature Survey

Several studies have demonstrated that VIA and VILI possess acceptable sensitivity and specificity for detecting cervical precancerous lesions. VILI has been reported to show higher sensitivity compared to VIA in multiple studies, while maintaining good specificity. Comparative research suggests that visual inspection methods offer diagnostic accuracy comparable to cytology and colposcopy, particularly when used in sequential screening strategies.

3. Problem Definition

Despite cervical cancer being preventable, screening coverage in India remains suboptimal. The absence of affordable, easily deployable screening methods contributes to delayed diagnosis. This study addresses the need to evaluate VIA and VILI as practical screening modalities suitable for resource-limited healthcare settings.

4. Methodology / Approach

A prospective cross-sectional study was conducted from May 2023 to April 2025 at tertiary care hospitals attached to J.J.M. Medical College, Davangere. A total of 100 sexually active women aged 20–45 years were included. All participants underwent VIA and VILI followed by colposcopic examination. Cervical biopsy was performed in women with abnormal findings. Histopathological examination was considered the gold standard. Statistical analysis was performed using IBM SPSS version 28.

5. Results & Discussion

Histopathological examination revealed cervical lesions in 10% of cases, including chronic cervicitis, LSIL, and HSIL. VIA and VILI demonstrated high specificity (100%) and acceptable sensitivity (70%), consistent with findings from previous studies. Colposcopy showed complete correlation with histopathology, reinforcing its diagnostic reliability. A statistically significant association was observed between contraceptive methods and cervical lesions.

6. Conclusion

VIA and VILI are effective, low-cost screening methods with excellent specificity for detecting cervical precancerous lesions. When combined with colposcopy, they provide a reliable and feasible screening strategy suitable for low-resource settings.

7. Future Scope

Integration of VIA and VILI into national screening programs can improve early detection of cervical cancer. Training healthcare workers in visual inspection techniques and implementing screen-and-treat strategies may significantly reduce disease burden.

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