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STUDY OF EFFICACY OF VISUAL INSPECTION WITH ACETIC ACID AND LUGOL'S IODINE IN SCREENING FOR CERVICAL INTRAEPITHELIAL NEOPLASIA.

Gynaecology

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ABSTRACT

Background: To assess the visual inspection with acetic acid (VIA) and Lugol's iodine (VILI) as screening methods for cervical Intraepithelial Neoplasia. The study also evaluates the usefulness of applying Logol's iodine in suspicious acetowhite areas.
Material & Methods: The study was conducted on 540 gynaecological patients who were non pregnant. After obtaining informed consent, each woman were subjected to VIA/VILI examination. A colposcopic directed biopsy was taken in patients with abnormal findings on colposcopy.
Results: In the present study, the sensitivity of VIA/VILI was 94.87%, specificity was 73.25%, positive predictive value was 21.63% and negative predictive value was 99.43% with biopsy as the reference standard.
Conclusion: VIA/VILI is simple and easy to learn approach that is minimally reliant upon infrastructure. Test results are available immediately. The application of lugol's iodine precisely delinates squamo – columnar junction and clarifies suspicious acetowhite areas.

KEYWORDS

Cervical Intraepithelial Neoplasia, Visual Inspection With Acetic Acid, Visual Inspection With Lugol's Iodine.

INTRODUCTION

Cervical cancer is one of the leading causes of death for middle-aged women in the developing world, yet it is almost completely preventable if precancerous lesions are indentified and treated in a timely manner1. It is one of the leading causes of death among women in developing countries and current estimates indicate that a total of 1,23,000 cases and 67,000 deaths due to cervical cancer occurred in India, contributing 23.2% and 25.2% to the global cervical cancer incidence and mortality respectively2. The initiating event in cervical carcinogenesis is infection with human Papilloma virus (HPV). The common histological types found in the ectocervix is squamous cell carcinoma and that in the endocervix is adenocarcinoma. Importance of cervical screening is repeatedly emphasized because invasive cervical cancer is preceded by a long phase of the precancerous lesion which is easily detectable by routine screening and can be treated effectively by simple methods. This makes cervical cancer easily preventable if routinely screened3,4. The goal of cervical cancer screening is detection and treatment of precancer before cancer develops. Pap smear is well-known to be effective in reducing the population-wide incidence of invasive cervical carcinoma when at least 70% population is screened with good quality Pap smears on a regular basis. However, this 70% population coverage is difficult to achieve in developing countries5. Secondary prevention involves screening for precancerous lesions and treating them. The three screening modalities are cytology, Visual Inspection of cervix and HPV testing.

In developed countries cervical cytologic screening of every women is part of National Health policy. In India, due to other more rampant problems of reproductive health including population control, cytologic screening for cervical cancer and its precancerous lesions is not being focussed. Thus, we need alternative tests which can be offered to every women for detecting cervical precancerous lesions before invasive cancer develops. In this context, visual screening was developed based on the principal that a higher concentration of intracellular proteins leads to a dense auto- whitening effect. Its advantage is that it is an easy to learn, inexpensive method that requires minimum equipment. In VILI, the dysplasic tissue does not take up iodine to poor glycogen content.

This study aims to evaluate the sensitivity and specificity of visual Inspection with Acetic acid and Visual Inspection with Lugol's Iodine (VILI) in screening for precancerous lesions of cervix. The study also evaluates the usefulness of applying Lugol's iodine in suspicious acetowhite areas on application of acetic acid.

MATERIAL & METHODS

The study was conducted on 540 sexually active women attending Gynae OPD of Chattrapati Shivaji Hospital, Shubharti Medical College, Meerut from August 2015 to August 2016. After obtaining ethical committee approval, cases which gave consent were enrolled for the study. Each case was subjected to through history taking, complete physical and pelvic examination. All women were subjected to VIA/VILI tests after explaining the procedure.

VIA involved gentle application of freshly prepared 5% acetic acid to ectocervix and endocervix (to include TZ). VIA was considered positive when an actowhite area either consistent ō low or high grade lesion was observed within the TZ.

VILI was considered positive if there was any area which took light yellow or orange stain (Saffron) in comparison to deep mahogany brown stained area of normal cervix and vagina.

Those who had abnormal results on VIA/VILI screening were referred for Colposcopic examination and directed biopsy, if needed. Colposcopic/Histodiagnosis was considered as gold standard against which sensitivity & specificity of VIA/VILI were evaluated. The utility of VILI in VIA positive cases was established. Thirty five cases were randomly selected from VIA/VILI negative group and subjected for Colposcopic examination as control.

Exclusion Criteria:
1.Unmarried women
2.Pregnant women
3.Women who have undergone therapy for cervical lesions.
4.Hysterectomised women

RESULTS

Among the 540 women participating in the study, majority of screening test positive women were between 21 to 40 years of age (Table 1).

Table 1: Result Of The Screening Tests In Different Age Groups.

Positive/Total (% positive)	
Age in years	VIA / VILI
≤ 20	33/171 (19.3)
21-30	59/171 (34.5)
31-40	41/171 (24.0)
≥ 41	38/171 (22.2)

VIA, visual inspection with acetic acid; VILI, Visual inspection with Lugol's iodine.

Out of 540 women enrolled in the study, screening by Visual Inspection with Acetic acid (VIA) and Visual inspection with Lugol's Iodine (VILI) detected 171 women which were positive on screening test to have precancersous lesion of cervix (Table 2).

Table 2:Distribution Of Cases According To Screening By VIA / VILI.

VIA / VILI	No. of Patients	Percentage
Positive	171	31.67
Negative	369	68.33
Total	540	100

All 171 cases which were positive on screening were subjected for colposcopic examination. Normal colposcopy was found in 19 cases which were positive on screening. Five cases had unsatisfactory colposcopy as squamocolumnar junctions was not visualized but had no abnormal lesion on transformation zone. Inflammatory finding on colpscopy was diagnosed with presence of acetowhite area which was not persistent. Dense acetowhite areas which were persistent was seen in 84 cases (Table 3).

Table 3: Colposcopic Findings In Screen Positive Cases.

Colposcopic Finding	No.of Patients	Percentage
Normal	19	11.1
Unsatisfactory	05	2.6
Inflammatory	47	24.4
Actowhite	84	49.1
Mosaic	08	4.1
Punctations	05	2.6
Atypical Vessels	03	1.6
Total	171	100

Thirty five cases which were randomly selected from screening test negative group also underwent colposcopic examination. This group served as control group in present study. Out of 35 screening test negative cases, 17 women had normal colposcopy and 2 had unsatisfactory colposcopy. Inflammatory and acetowhite lesions were detected in 16 screen negative cases on colposcopy (Table 4).

Table 4: Colposcopic Findings In 35 Screen Negative Cases.

Colposcopic Finding	No.Of Paitents	Percentage
Normal	17	48.6
Unsatisfactory	02	5.7
Inflammatory	09	25.7
Actowhite	07	20.0
Mosaic	None	
Punctations	None	
Atypical Vessels	None	
Total	35	100

Normal and unsatisfactory colposcopy cases were not subjected for colposcopic directed biopsy. Remaining 147 cases in VIA/VILI positive group underwent colposcopic directed biopsy. Squamous metaplasia was reported in 34 women while majority had cervicitis as biopsy result. Cervical Intraepithelial lesion was detected in 37 cases. CIN – I was present in 31 cases and CIN – II found in 6 cases (Table 5).

Table5: Histopathological Diagnosis In Screen Positive Cases (Colposcopic Directed Biopsy)

Histopathological iagnosis	No.of Patients	Percentage
Chronic cervicitics	49	33.3
Acute on chronic cervicitis	27	18.4
Squamous metaplasia	34	23.1
CIN-I	31	21.1
CIN-II	06	04.1
CIN-III	None	
Caecinoma	None	
Total	147	100

CIN, Cervical Intraepithelial Neoplasia

Among VIA/VILI screen negative group, 16 cases also underwent colposcopic directed biopsy in which CIN – I was present in 2 cases (Table 6).

Table 6: Histopathological Diagnosis In Screen Negative Cases (Colposcopic Directed Biopsy)

Histopathological Diagnosis	No. Of Patients	Percentage
Chronic Cervicitis	08	50.0
Acute on chronics cervicitis	None	
Squamous metaplasia	06	37.5
CIN-I	02	12.5
CIN-II	None	
CIN-III	None	
Carcinoma	None	
Total	16	100

The overall biopsy result detected 31 cases of CIN – I and 6 cases of CIN – II in VIA/VILI screening test positive group and 2 cases of CIN –I in VIA/VILI screening test negative group (Table 7).

Table 7: Screen Test Findings Of Cases In Study.

VIA/ VILI	No.of Patients	Refer for Colposcopy	Positive Colposcopy	In need of Biospy	Biospy Result
Positive	171	171	147	147	CIN I-31 CIN II-6
Negative	369	35	16	16	CIN I-2
Total	540	206	163	163	39

The sensitivity and specificity of VIA/VILI screening test was 94.8% and 73.25% respectively in our study (Table 8).

Table 8: Result Of Screening Test In Present Study.

Screening test	Sensitivity	Specificity	PPV	NPV
VIA/VILI	94.87%	73.25%	21.63%	99.45%

PPV, Positive Predictive value, NPV, Negative Predictive value.

DISCUSSION

Cervical cancer is a potentially preventable cancer. It is preceded by premalignant lesions which may take 5-15 years to progress to invasive cancer. If detected and treated timely, pre-invasive disease has nearly 100 percent cure rate with simple surgical procedure, while advanced cancers have less than 35% survival rates6. Cytology bases screening programmes are difficult to organize owing to limited infrastructure, trained personnel and funds7. Thus, in developing countries, there is need for alternative strategies for early detection of pre-malignant cervical lesions which are cheap, easy to perform, can be done by paramedical workers and give immediate results.

In the present study, the sensitivity of VIA and VILI in screening for CIN is 94.87%, specificity 73.25%, positive predictive value was 21.63%, and negative predictive value was 99.45% with biopsy as the reference standard. The study is comparable to study done by Agarwal et al. In which the sensitivity of VIA and VILI was 94.70%, and specificity was 48.30%. Our study also correlates with Sinha et al. study wherein sensitivity of VIA/VILI 88.23% and specificity was 78.68%, positive predictive value was 53.57%, and negative predictive value was 96% taking biopsy as the reference standard8. Megevand et al. in their study found VIA to detect 54% of high grade lesions and hence, concluded that in location where access to cytopathology is limited, naked eye visual examination of the cervix after application of dilute acetic acid can be a good alternative9. In a study done by Ghosh et al., it was concluded that in low – resource settings, cervical cancer screening by Pap smear can be replaced by visual methods like VILI, which has the highest sensitivity (100%) to detect any grade of dyplasia, and a good specificity (93.3%)10. Consul et al. compared effectiveness of Pap smear versus visual application of acetic acid and VILI for mass screening of premalignant and malignant lesion of cervix and showed that VIA and VILI had sensitivity comparable to Pap smear and can thus be a suitable potential alternative / adjunctive screening test not only in poor resource setting but also in well equipped centers11. A study by Kaur et al. concluded that in low resource settings, screening by Pap smear has not been successful in reducing incidence of cervical cancer. VIA and VILI are cheaper and easily available and can be used by medical and paramedical personnel on a large scale basis12. Thus, VIA/VILI is cost effective secondary prevention of cervical cancer and precancerous lesion.

CONCLUSION

VIA/VILI is simple and easy to learn approach that is minimally reliant upon infrastructure. Test results are available immediately. The application of lugol's iodine precisely delinates squamo – columnar junction and clarifies suspicious acetowhite areas.

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DECLARATIONS

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REFERENCES

1. Carr KC, SellorsJW. Cervical cancer screening in low resource settings using visual inspection with acetic acid. J Midwifery Womens Health 2004;49:329-37
2. Ferlay J, Soerjomataram I, Ervik M, et al. GLOBOCAN 2012 v1.0, Cancer Incidence and Worldwide: IARC Cancer Base No. 11.Lyon, France: International Agency for Research on Cancer; 2013.
3. Bhattacharyya AK, Nath JD, Deka H. Comparative study between Pap smear and visual inspection with acetic acid (via) in screening of CIN and early cervical cancer. J Midlife Health 2015;6:53-8.
4. Bhatia N, Mukhopadhyay A, Kriplani A, Pandey RM, Gravitt PE, Shah KV, et al. Evaluation of adjunctive tests for cervical cancer screening in low resource settings. Indian J Cancer 2007;44:51-5.
5. Singh A, Singh K, Agarwal NR. Correlation of Pap smear and visual inspection with acetic acid for screening of premalignant and malignant lesion of cervix. Int J Res Med Sci 2015;3:2382-5. Available from: http://www.msjonline.org. [Last accessed on 2017 Jul 28].
6. Dinshaw KA, Shastri SS. Screening for cervical cancer in India. Natl Med J India 2001;14:1-3.
7. Shastri SS, Dinshaw K, Amin G, Goswami S, Patil S, Chinoy R, et al. Concurrent evaluation of visual, cytological and HPV testing as screening methods for the early detection of cervical neoplasia in Mumbai, India. Bull World Health Organ 2005;83:186-94.
8. Snehil Sinha, Vinita Singh, Byasdev Mishra, Anu Singh. Comparing the efficacy of visual inspection of cervix with acetic acid and Lugol's iodine with Pap smear cytology in screening for cancer cervix. J Curr Res Sci Med 2018;4:10-6.
9. Megevand E, Denny L, Dehaeck K, Soeters R, Bloch B. Acetic acid visualization of the cervix: An alternative to cytologic screening. Obstet Gynecol 1996;88:383-6.
10. Ghosh P, Gandhi G, Kochhar PK, Zutshi V, Batra S. Visual inspection of cervix with lugol's iodine for early detection of premalignant & malignant lesions of cervix. Indian J Med Res 2012;136:265-71.
11. Consul S, Agrawal A, Sharma H, Bansal A, Gutch M, Jain N, et al. Comparative study of effectiveness of Pap smear versus visual inspection with acetic acid and visual inspection with Lugol's iodine for mass screening of premalignant and malignant lesion of cervix. Indian J Med Paediatr Oncol 2012;33:161-5.
12. Kaur K, Bhosale UT. Comparison of methods of visual inspection of cervix with cervical cytology in detection of pre-invasive lesions of cervical cancer. J Evol Med Dent Sci 2016;5:5394-8.