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A STUDY OF VIA AND VILI AS A CERVICAL CANCER SCREENING METHOD

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ABSTRACT **Introduction:** As per globocan 2020, 604100 new cases of cervical cancer were detected worldwide in 2020, and 341831 deaths were there due to this malignancy. About 90% of these cases are found in low and middle-income countries. Cervical cancer is the only female genital tract cancer which can be diagnosed and treated in precancerous state by simple screening techniques. VIA/VILI are cheap and noninvasive methods and can be done in a low-level health facility. More importantly, VIA and VILI provide instant results, and those eligible for treatment of the precancerous lesions can be treated immediately. **Material And Methods:** This retrospective study was carried out in a Gynecology clinic in district Shivpuri M.P. From 1 April 2019 to 31 march 2022. 450 patients were studied. A detailed history regarding name, age, residence, socio-economic status, parity, any previous study, and any allergy was enquired. All findings of VIA and VILI-positive cases were carefully documented in the proforma. In this study visual inspection of the cervix was done in 450 cases and 59 biopsy specimens were sent. **Results:** In this study most of the patients were between 21-40 years of age (40%), multipara (74.88%), of low socioeconomic background (50.66%), and most of them were from rural areas (64%). The most common presenting symptom was excessive vaginal discharge (58.88%) followed by abnormal bleeding (13.11%). (13.11%) cases were VIA positive and (10.44%) cases were both VIA/VILI positive. Biopsy was taken from 59 patients who were VIA positive, this test detected 5.55% (25 patients) of CIN I, 2% (9 patients) of CIN II, 1.77% (8 patients) of CIN III, and 0.22% (1 patient) cases of squamous cell carcinoma. **Conclusion:** We found that VIA and VILI can be adopted as screening tools for the diagnosis of cervical lesions. Result and follow-up treatment can be provided in a single sitting hence fewer women are lost to follow-up.

KEYWORDS : Cervical cancer, VIA/VILI, precancerous lesions

INTRODUCTION

Cervical cancer is 4th most common cancer in women. Cervical cancer is one of the leading causes of cancer death among females worldwide. As per globocan 2020, 604100 new cases of cervical cancer were detected worldwide in 2020, and 341831 deaths were there due to this malignancy.[1] About 90% of these cases are found in low and middle-income countries. 2/3 of cervical cancer diagnosed are found at an advanced stage with a poor prognosis for survival.In India cervical cancer accounted for 9.4% of all cancers and 18.3% (123,907) of new cases in 2020.[2]

Cervical cancer continues to be a major public health problem in India in the absence of widespread organized cervical screening programs. Cervical cancer is a preventable disease because it has a preinvasive phase that can be detected and treated if women are screened.[3] Effective regular screening programs for early detection and treatment of precancer lesions can lead to a significant reduction in the morbidity and mortality associated with this cancer. Cervical cancer screening is a must to reduce cervical cancer incidence and mortality & to detect disease in women who do not have any symptoms.[1,2]

Some of the important screening tests are traditional Pap smear, visual inspection with acetic acid & Lugol's iodine (VIA/VILI), liquid-based cytology (LBC), and HPV testing. The disease burden of cervical cancer has been reduced remarkably in developed countries by Pap smears, mainly in the United States, since the 1950s. However, the accuracy of a traditional Pap smear could be easily affected by the following factors: the facilities in the cytological room, professional technicians, sampling method, slide quality, dyeing skills, and cytological personnel experience.[2] In developed countries with high standard experimental conditions and technical levels, the sensitivity of cytology is as high as 80%−90%, in contrast, in resource-limited regions, it could be as low as 30%−40%.[4]

In western countries, the routine Papanicolaou and human papillomavirus (HPV) testing has drastically reduced cervical cancer deaths but since there is no proper infrastructure, facilities, and medical training in developing countries, the rate of cervical cancer is still high there.[5]

Visual Inspection with Lugol's Iodine (VILI) is also known as Schiller's test. It uses Lugol's iodine instead of acetic acid. Visual inspection with acetic acid (VIA) can be performed with the naked eye (also called cervicoscopy or direct visual inspection, [DVI]), or with low magnification (also called gonioscopy, aided VI, or VIAM).[6]

VIA is an effective, inexpensive screening test that can be combined with simple treatment procedures for early cervical lesions, provided by trained health workers. Studies have demonstrated that VIA or VILI are alternative screening methods. These methods are cheap and noninvasive and moreover they can be done in a low-level health facility. Most importantly, VIA and VILI provide instant results, and those eligible for treatment of the precancerous lesions can be treated immediately. This see-and-treat method ensures adherence to treatment soon after diagnosis, hence emanate from the problem of default to appointments and referrals.[7,8]

Visual inspection with acetic acid is a naked-eye examination of the uterine cervix, after applying 5% acetic acid and interpreting the result after 1 minute. This is a simple and inexpensive test for the detection of cervical precancerous lesions and early invasive cancer.[4,5] The results of the VIA test are immediately available and do not require any laboratory support. Acetic acid application on the cervical epithelium causes reversible intracellular dehydration and coagulation of protein within the cervical cells.[5] The intensity of coagulation is dependent on the amount of protein in the cell. As the dysplastic cells have more chromatin content, the coagulation is intense and cells turn white after the application of acetic acid.[9]

The VIA test can be categorized as VIA positive or VIA negative. A test is considered positive if there is the detection of well-defined, densely opaque dull acetowhite lesions in the TZ of the cervix. The test is said to be negative in the case of faint, ill-defined, translucent acetowhite areas, faint ace to whitening of endocervical polyps, nabothian cysts, dot-like acetowhite appearance, and prominent SCJ.[8,9]

Naked eye visual inspection of the uterine cervix, after the application of Lugol's iodine as an adjunct to the VIA test, to confirm and delineate the abnormal lesion is called visual inspection with Lugol's iodine. It works on the principle that the squamous epithelium contains glycogen. Since iodine is glycophillic, when applied to normal squamous epithelium, it turns mahogany brown or black. But

columnar epithelium and immature metaplastic cells do not contain glycogen, so they do not stain after the application of Lugol's iodine. The inflammatory cells either stain partially or do not stain. The abnormal cells contain either less glycogen or no glycogen depending upon the degree of the lesion. So these lesions do not stain brown after the application of iodine and become mustard yellow.[10]

Various studies indicate that VIA more or less is as effective as conventional cytology in diagnosing high-grade lesions. both VIA and VILI appear to be the most promising technology which can successfully serve as an alternative to cytology.[7]

The Alliance for Cervical Cancer Prevention (ACCP) has proved that VIA and VILI are as effective or even more effective than the PAP test at identifying precancerous lesions and when these techniques are combined and correlated with colposcopy their efficacy doubles for screening purposes.[4] Several Asian and African countries have implemented the use of these techniques as they are inexpensive and easy to learn techniques. The paramedical staff which includes nurses, female health workers, etc, and nonspecialist doctors can be trained through a 1 to 2 weeks course. These tests can be performed at primary and secondary health centers. In countries where resources are limited and HPV test is not feasible, WHO recommends that screening should be done with VIA and VILI procedures. So to prevent the occurrence of cervical cancer in India an early screening is needed. VIA and VILI serve as important and inexpensive screening tests that need to be incorporated into our healthcare systems to prevent the untimely deaths of women in the country.[6,7]

Material And Methods

This retrospective study was carried out at a gynecology clinic in district Shivpuri M.P. From M.P. From 1 April 2019 to 31 march 2022. 450 patients were studied. A detailed history regarding name, age, residence, socio-economic status, parity, any previous study, and any allergy was enquired. Detailed obstetrics and menstrual history, previous history of intake of oral contraceptive pills, IUCD, insertion of any treatment for white discharge, and other high-risk factors were taken. Per speculum & a pervaginal examination was done.

Inclusion criteria

- All women aged between 21 to 65.

Exclusion criteria

- Known cases and suspicious cases of carcinoma cervix
- The pregnancy

Procedure

After counseling and written consent, all patients were examined for VIA and VILI in an outpatient Colposcopic clinic. In the dorsal position under all aseptic precautions, Cusco's speculum was inserted. A Pap smear was taken from all patients after cleaning the cervix with normal saline, freshly prepared 3% acetic acid was applied with a swab stick on the cervix, and the cervix was expected for any acetowhite area. Lugol's iodine was generously applied to the cervix and was inspected under a good light source. Positive tests for VIA were opaque aceto white lesions on applying 3% acetic acid or detection of definite yellow iodine non-uptake areas with Lugol's iodine in the transformation zone or close to touching the squamocolumnar junction. Positive cases were scheduled for cervical biopsy.

Using punch biopsy forceps biopsy was taken from VIA and/or VILI positive area or suspicious-looking cervical area. The specimen was sent for histopathological examination in formalin solution. All findings of VIA and VILI-positive cases were carefully documented in the proforma. In this study visual inspection of the cervix was done in 450 cases and 59 biopsy specimens were sent.

Biopsy results were categorized as normal, chronic cervicitis, mild dysplasia (CIN 1), moderate dysplasia (CIN 2), severe dysplasia (CIN 3), carcinoma in situ (CIN 3), and invasive carcinoma. Similarly, the sensitivity and specificity of VIA and VILI were computed.

All the data were analyzed using IBM SPSS Ver.20 software. Cross-tabulation and frequency distribution were used to prepare tables. Data are expressed as numbers, percentages, and means.

RESULTS

In this study, 450 patients were examined during visual inspection.

Table 1: Distribution as per age group (N=450)

Age	Frequency	Percent
21-30	54	12
31-40	180	40
41-50	112	24.88
51-60	68	15.11
60-65	36	8
Total	**450**	**100**
Socio-economic	**Frequency**	**Percent**
High	33	7.33
Middle	189	42
Low	228	50.66
Total	**450**	**100**
Age at marriage	**Frequency**	**Percent**
17-20 years	254	56
21-30 years	184	40.88
>30 years	14	3.11
Total	**450**	**100**
Residence	**Frequency**	**Percent**
Rural	288	64
Urban	162	36
Total	**450**	**100**
Parity	**Frequency**	**Percent**
Nullipara	41	9.11
Multipara	337	74.88
Grand multipara	72	16
Total	**450**	**100**

In this study we found that most of the patients were between 31-40 years of age (40%), most of them were of low socioeconomic background (50.66%), most of them were married 17-20 years of age (56%), most of them were from rural areas (64%) and most of them were multipara (74.88%).

Table 2:- Distribution of sign symptoms (N=450)

Sign-symptoms	Number	Percent
Excessive vaginal discharge	265	58.88
inter-menstrual bleeding and abnormal bleeding	59	13.11
Post-menopausal bleeding	27	6
Post-coital bleeding	41	9.11
Dyspareunia	36	8
Low backache	22	4.88
Total	**450**	**100**

The most common presenting symptoms were excessive vaginal discharge (58.88%) followed by abnormal bleeding (13.11%).

Table 3:- Results of VIA and VILI Positive (N=450)

Test	Positive no.	Percentage
Only VIA	59	13.11
VILI + VIA	47	10.44

(13.11%) cases were VIA positive and (10.44%) cases were both VIA/VILI positive.

Table 4:- Distribution of cases as per histopathology (N=59)

Histopathology	Positive no.	Percentage
Chronic cervicitis	16	3.55
CIN I	25	5.55
CIN II	9	2
CIN III	8	1.77
Squamous cell carcinoma	1	0.22
Total	**59**	**13.11**

Biopsy was taken from 59 patients who were VIA positive this test detected 5.55% (25 patients) of CIN I, 2% (9 patients) of CIN II, 1.77% (8 patients) of CIN III, and 0.22% (1 patient) cases of squamous cell carcinoma.

DISCUSSION

This retrospective study was carried out at a gynecology clinic in district Shivpuri M.P. From M.P. From 1 April 2019 to 31 march 2022. 450 patients were studied.

In our study, we found that most of the patients were between 31-40 years of age (40%). This finding goes in accordance with a study done by Juneja A et al[11] where most of the patients were between 30 to 40 years of age.

Duration of marriage and duration of exposure to sexual intercourse has an important role in the genesis of cervical dysplasia. In this study, most of them were married between 17-20 years of age (56%), most of them were from rural areas (64%) and most of them were multipara (74.88%). These findings are closely associated with the study done by Aggarwal P et al[12] where most of the patients were multipara and married at a younger age.

In this study, most of them were of low socioeconomic backgrounds (50.66%). In a study done by Bhattacharya AK et al[13], it was found that the incidence of CIN was higher in the lower socioeconomic class (30%) along with an increased incidence of carcinoma in this group (3%).In their study also most of the patients belong to the lower socioeconomic group. The factors responsible for the higher incidence of CIN and ca cervix in the lower economic group include poor personal hygiene, poor living condition. Illiteracy, unstable marriage, early age at first intercourse. These findings go in accordance with our study.

In this study, the most common presenting symptoms were excessive vaginal discharge (58.88%) followed by abnormal bleeding (13.11%). In a study conducted by Sherwani RK et al[14], the most common presenting complaint was discharged per vaginum in 68 (42.5%) cases, followed by pain lower abdomen with abnormal bleeding in 44 (27.5%) cases and menstrual irregularity in 38 cases (23.8%). These findings were consistent with those of Bhargava VL et al[15], who also found discharge per vaginum, was the commonest symptom in lesions of the cervix. These findings correlate with our study.

In our study (13.11%) cases were VIA positive and (10.44%) cases were both VIA/VILI positive.

Biopsy was taken from 59 patients who were VIA positive this test detected 5.55% (25 patients) of CIN I, 2% (9 patients) of CIN II, 1.77% (8 patients) of CIN III, and 0.22% (1 patient) cases of squamous cell carcinoma.

In a study done by Consul S et al[16] on 210 patients, 34 (16.27%) had positive Pap test, 29 (13.87%) had positive VIA and 24 (11.43%) had positive VILI. Of the total of 48 patients in whom either of the screening tests was positive and had undergone a cervical biopsy, one had CIN-3, three had CIN-2, 12 had CIN-1, three had carcinoma in situ CIS and 29 reported normal. In their study, 40 patients were picked up as positive by a combination of these tests, of which 19 (47.50%) had CIN on biopsy.

In another study done by Pothisuwan M et al[17] on 106 women, the VIA test was positive in 33 women (31.1%) and negative in 73 women (68.9%). Among the women with VIA test positive, 14 had a high-grade lesion (42.4%) while 19 had no significant lesions.

A study done by Paswan A et al[18] concluded that VIA and VILI were found to be positive in 96 patients (24%) and 72 patients (18%) and negative in 304 patients (76%) and 328 patients (82%) respectively. On biopsy, VIA detected 27 mild dysplasia and 20 Cervical Intraepithelial Neoplasia (CIN). VILI detected 27 LSIL, 11 HSIL, and 1 invasive cancer.

Pothisuwan M et al[17] emphasized the significance of VIA that it may reduce the necessity of colposcopy which was in concordance with our study. Ghosh P et al[19] found all biopsy positive cases (CIN I or worse) were VILI positive. Shankaranarayanan R[20] in his study also shared that VIA with good training is a very useful screening method to prevent cervical cancer in developing countries.

CONCLUSION

In this study, we found that the sensitivity and specificity of visual inspection with acetic acid (VIA) and visual inspection with Lugol's iodine (VILI) with cervical biopsy as the gold standard. We found that VIA and VILI can be adopted as screening tools for the diagnosis of cervical lesions. Result and follow-up treatment can be provided in a single sitting hence fewer women are lost to follow-up.

In developing countries, where cervical cytology screening is not possible due to limited resources (lack of infrastructure and trained health staff and financial limitations) visual inspection of the cervix can be used as a primary screening method for a diagnosed premalignant lesion of the cervix because it is very simple inexpensive, easy and low learning curve method. As fewer specialized personnel, less infrastructure, training, and equipment are required hence VIA screening can be implemented in remote public healthcare settings with more coverage

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