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COMPARING THE EFFICACY OF VISUAL INSPECTION OF CERVIX WITH ACETIC ACID (VIA) AND LUGOL'S IODINE WITH PAP SMEAR CYTOLOGY: CERVICAL CANCER SCREENING.

Obstetrics And Gynaecology

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ABSTRACT

Cervical cancer is a major public health problem which results in higher mortality. India accounts 15.2% of the total cervical cancer deaths in the world. The prevention of cervical cancer is possible with early detection. Pap smear is the most effective, simple, inexpensive and an excellent technique to screen the cervical carcinoma and about 70% population is screened with good quality Pap smear on a regular basis. The present study aimed to compare the efficacy of visual inspection of cervix with Acetic Acid (VIA) and Lugol's Iodine (VILI) with Pap Smear cytology in screening for cancer of cervix. This prospective analytical study was conducted over a period of 6 months and included a total of 200 patients attending the gynaecology outpatient department with various complaints and patients admitted to the gynaecology ward. A detailed history was collected and all the patients were clinically examined and specimen was collected for cytology followed by visual inspection of cervix with 5% Acetic Acid and Lugol's iodine. The mean age of the patients was 36.3450± 7.6168 years (most common age group was 31-40 years), mean age of marriage of patients was 21.1050± 1.3942 years, mean age of first childbirth of patients was 22.9797± 1.6841 years. A statistically significant association among VIA & biopsy, VILI & Biopsy, PAP smear & biopsy, VIA & PAP smear and VILI & PAP smear (P<0.0001). The study concluded that VIA and VILI can be used as an alternative for screening of carcinoma of cervix.

KEYWORDS

Visual inspection, Acetic acid, Lugol's iodine, Cervical cancer, PAP smear, Carcinoma and Biopsy.

INTRODUCTION

Cervical cancer is a major public health problem which results in higher mortality. In developing countries cervical cancer is one of the leading causes of mortality among middle-aged women in the which is almost completely preventable if early screening and treatment is done.[1] India accounts 15.2% of the total cervical cancer deaths in the world.[2]

The prevention of cervical cancer is possible with early identification. The commonest risk factors of cervical cancer are persistent HPV infection, older age, multiple sexual partners, smoking, sexually active at an early age, low socio- economic status, exposure to diethylstilboestrol, immune system deficiency, and patients having other STDs such as chlamydia, gonorrhoea, syphilis and HIV/AIDS- which increases the risk of HPV.[3]

Pap smear is the most effective, simple, inexpensive and an excellent technique to screen the cervical carcinoma and about 70% population is screened with good quality Pap smear on a regular basis.[4] In India, Pap smear facilities are largely restricted to urban areas only. Visual inspection with Acetic Acid (VIA) and visual inspection with Lugol's Iodine (VILI) have been shown to be a feasible alternative to cytology in low-resource settings.[5,6]

The Pap test has high false–negative rate which is associated with several factors of both sampling and interpretation. Uneven cell distribution, overlapping cells, blood, or inflammation in conventional pap smear makes its interpretation difficult.[7]

The various studies suggest that visual inspection with acetic acid (VIA) and visual inspection with lugol's iodine (VILI) are the best alternative in screening of cervical cancer in low resource settings as these techniques are much cheaper and available than pap smear. Moreover, VIA and VILI are more sensitive than the conventional pap smear cytology in detecting the intraepithelial lesions, although it has a lower specificity. Pap smear has a high specificity but lower sensitivity. Thus, the present study was conducted with the aim to compare the efficacy of visual inspection of cervix with Acetic Acid (VIA) and Lugol's Iodine (VILI) with Pap Smear cytology in screening for cancer of cervix.

OBJECTIVES

1.To know the sensitivity and specificity of Pap Smear, visual inspection of cervix with Acetic Acid (VIA) and Lugol's Iodine (VILI) in detecting carcinoma cervix.
2. To detect precancerous conditions early and treating them before they progress to invasive cancer.
3. To create awareness among women for cervical cancer screening and preventive health-seeking behaviour.

MATERIAL AND METHODS

This prospective analytical study was conducted over a period of 6 months (January 2021 to June 2021) in the Department of Obstetrics and Gynaecology, Sanjay Gandhi Memorial Hospital in active collaboration with the Department of Pathology, Sanjay Gandhi Memorial Hospital, New Delhi.

A total of 200 patients attending the gynaecology outpatient department with various complaints and patients admitted to the gynaecology ward were involved in the study.

Inclusion Criteria:

- Women aged between 25 and 65 years (FOGSI 2018 Guidelines) with intact uterus and cervix.
- Women who were willing to participate in the study.

Exclusion Criteria:

- Women aged less than 25 and more than 65 years
- Pregnant women.
- Women during menstruation.
- Women who underwent hysterectomy
- Women with prior treatment for CIN, and proven cancer cervix cases.
- Women with history of cervical lesions (cryo, cautery, laser)

A detailed history was collected and all the patients were clinically examined and specimen was collected for cytology followed by visual inspection of cervix with 5% Acetic Acid and Lugol's iodine.

Biopsy (fixed with 10% formaldehyde) was done for confirmation of lesion if either of the three screening tests had a positive finding or if Pap smear reported ASCUS, for confirmation of lesion. The patients who reported normal on all screening tests were followed for 3 years. Patients who were positive at either of the screening tests or underwent biopsy were treated according to the grade of the lesion.

The data was collected and recorded in Microsoft excel spreadsheet and then analysed by SPSS (version 27.0) and Graph Pad Prism version 5. Data was distributed into frequency and percentage and t test and chi square tests were performed to check the significant associations among variable.

OBSERVATION AND RESULTS

A total of 200 patients were involved in the study. The mean age of the patients was 36.3450± 7.6168 years (most common age group was 31-40 years), mean age of marriage of patients was 21.1050± 1.3942 years, mean age of first childbirth of patients was 22.9797± 1.6841 years. Among all the most (86%) of the patients were housewives and were from low socioeconomic status (85%).

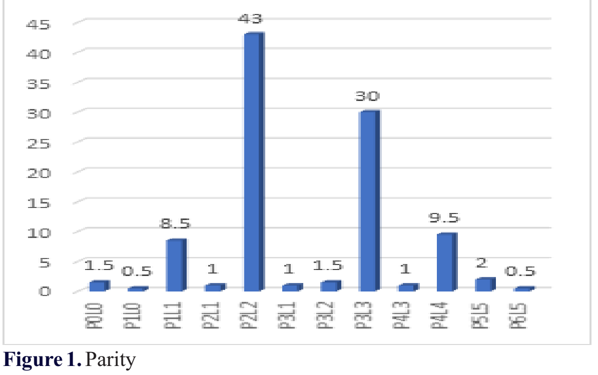

Figure 1. Parity

Figure 1, showed that 43% patients had P2L2Parity followed by 1.5% patients were nulliparous, 0.5% patient had P1L0 Parity, 8.5% patients had P1L1Parity, 1.0% patients had P2L1 Parity, 1.0% patients had P3L1 Parity, 1.5% patients had P3L2 Parity, 30.0% patients had P3L3 Parity, 1.0% patients had P4L3 Parity, 9.5% patients had P4L4 Parity, 2.0% patients had P5L5 Parity and 0.5% patients had P6L5 Parity.

Table 1 Contraceptive Methods Used

Type of contraceptives	Frequency	%age
IUCD (Cu T)	18	9
Oral contraceptives	8	4

Table 1, depicted that 9% of the patients had history of contraceptive use and 4% had history of oral contraceptive use.

Table 2 History Of Sexually Transmitted Disease In Patients And In Partner

STD	Frequency	%age
In patient	0	0
In partner	1	0.5

Table 2, showed that no women had history of sexually transmitted disease and 1 patient had history of STD in Partner.

Table 3 Age of Menarche

Age	Frequency	%age
12	2	1.0
13	155	77.5
14	43	21.5

Table 3, represented that majority (77.5%) of the patients attained menarche at 13 years of age, 21.5% attained menarche at 14 years of age and 1% attained menarche at 12 years of age.

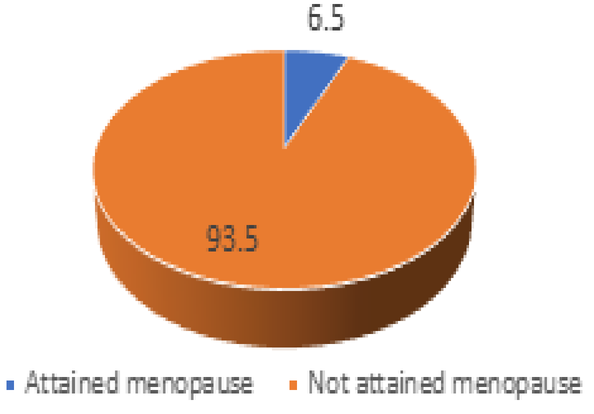

Figure 2. Attainment Of Menopause

It was observed that most of the patients (93.5%) doesn't attained menopause, 6.5% patients attained menopause as shown in figure 2.

Table 4 History Of Chronic Vaginal Infection

Chronic Vaginal Infection	Frequency	%age
Candidiasis	24	12
Trichomoniasis	11	6
No	165	82

Table 4, represents that 12% patients had the history of candidiasis infection and 6% patients had the history of trichomoniasis infection and no history of infection was found in 82% patients.

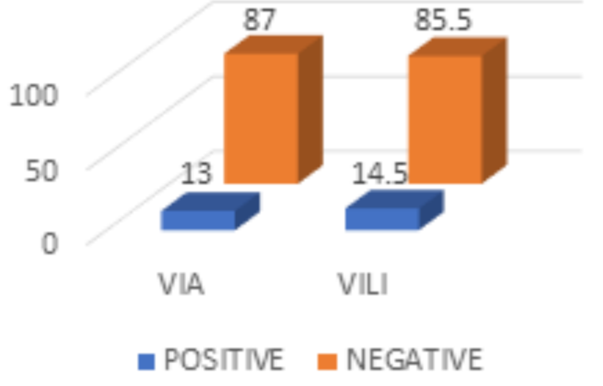

Figure 3. VIA & VILI test results

In the present study 13.0% patients had positive VIA and 87.0%) patients had negative VIA. 14.5% patients had positive VILI and 85.5% patients had negative VILI as depicted in figure 3.

Table 5 PAP Smear Cytology

PAP smear	Frequency	%age
NILM	126	63.0
Inflammatory	57	28.5
CIN1	12	6.0
CIN2	2	1.0
CIN3	1	0.5
SCC Cervix	2	1.0

Table 5, showed the PAP smear cytology. It was found that 63.0% patients had NILM, 28.5% patients had Inflammatory smear, 6.0% patients had CIN1, 1.0% patients had CIN2, 0.5% patient had CIN3 and 1.0% patients had SCC Cervix in Pap smear.

Table 6 Cervical Biopsy

Cervical Biopsy	Frequency	%age
CIN1	12	6
CIN2	2	0.5
CIN3	1	0.5
SCC CERVIX	2	1
NORMAL	15	8
Not Indicated	168	84

Table 6, depicted that 6% patients had CIN1, 0.5% patients had CIN2, 0.5% patient had CIN3, 1.0% patients had SCC Cervix, and 8% patients had Normal study in Cervical Biopsy.

The present study further found a statistically significant association among VIA & biopsy, VILI & Biopsy, PAP smear & biopsy, VIA & PAP smear and VILI & PAP smear ($P<0.0001$).

DISCUSSION

In this study a total of l 200 patients were included in this study. The mean age of the patients was 36.3450± 7.6168 years, mean age of marriage of patients was 21.1050± 1.3942 years, mean age of first childbirth of patients was 22.9797± 1.6841 years, 43% patients had P2L1 parity, 9% of the patients had history of contraceptive use and 4% had history of oral contraceptive use, 0.5% patient had history of STD in Partner, 12% patients with Candidiasis, and 5.5% patients with Trichomoniasis as chronic vaginal infections and the age of the menarche was 13 years in 77.5% patients, 14 years in 21.5% and 12 years in 1% patients. In a similar study conducted by Egede J, et al. (2018), found that majority of the patients were in the 31-40 years of age, most of the patients (49%) had 1-4 parity and 74% women were in

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premenopausal age.[8]

In our study, 26 (13%) subjects were VIA Positive, 29 (14.5%) were VILI Positive. On Pap Smear Cytology, 12(6.0%) subjects had CIN1, 2(1%) subjects had CIN2, 1 (0.5%) subject had CIN3, 2(1%) subjects had SCC cervix and 57(28.5%) subjects had inflammatory smear. We compared these test results with Cervical Biopsy which was used as the gold standard in our present study. In a similar study conducted by Attri A et al (2020) found that among the 350 women studied, 59 women (16.9%) had abnormal VIA, 64 women (18.2%) had abnormal VILI.[9]

The present study showed that, 26 (13%) subjects who were VIA positive, 15(83.3%) subjects had abnormal study in Cervical Biopsy and 11(6%) had normal study for Biopsy. Among 29(14.5%) subjects that were VILI positive, 16(88.9%) subjects had abnormal Cervical Biopsy and remaining 13(7.1%) subjects had normal Cervical Biopsy. 17 subjects had abnormal Pap Smear results, out of which, 12(6.0%) subjects had CIN1, 2 (1.0%) subjects had CIN2, 1 (0.5%) subject had CIN3 and 2 (1.0%) subjects had SCC Cervix. 57 (28.5%) subjects had Inflammatory PAP smear and remaining 126 (63%) subjects had normal study in Pap Smear.

On comparing the results of Pap Smear with that of Cervical Biopsy, it was found that in Positive Biopsy, 11 (61.1%) subjects had CIN1 in Pap Smear, 2 (11.1%) subjects had CIN2, 1 (5.6%) subject had CIN3, 2 (11.1%) subjects had SCC Cervix and 2 (11.1%) subjects had Inflammatory PAP smear. In Negative Cervical Biopsy, 1 (0.5%) subject had CIN1 in Pap smear, 55 (30.2%) subjects had Inflammatory PAP smear and 126 (69.2%) patients had normal PAP smear. It was statistically significant ($p<0.0001$).

It was found that in Positive PAP smear, 16 (88.9%) patients had positive VILI and 2 (11.1%) patients had negative VILI. In Negative PAP smear, 13 (7.1%) patients had positive VILI and 169 (92.9%) patients had negative VILI. It was statistically significant ($p<0.0001$). Sensitivity of VIA was 83.3%, Specificity 94.0%, Positive Predictive Value 57.7% and Negative Predictive Value 98.3% with biopsy as the reference standard. The Sensitivity of VILI was 88.9%, Specificity 92. 9%, Positive Predictive Value 55.2% and Negative Predictive Value 98.8% with biopsy as the reference standard. The Sensitivity and Specificity of Pap smear in our study was found to be 88% and 92% respectively. The findings were consistent with the study conducted by Attri A et al (2020) found that on pap smear, 10 women were reported as ASCUS, 11 as L-SIL and 1 as H-SIL. Cervical biopsy was done in 98 women, out of which 70 had one or more abnormality on VIA, VILI, or Pap and 28 women had normal results. 16 women (16.3%) reported as CIN-1 and 2 women (2.07%) as CIN-3. VIA and VILI had a higher sensitivity as compared to pap. However, pap was more specific. VIA presented the best sensitivity (88.8%), followed by VILI (83.3%), and Pap (72.2%).

Pap smear had the highest specificity of 97.2%. The positive predictive value of Pap was higher as compared to VIA and VILI, whereas there was no difference in NPV of the three. VIA and VILI have good sensitivity, with reasonable specificity and because of their cost effectiveness and ease of availability, these can be an alternative screening modality for cervical cancer screening.[9] Similarly, Catarino R et al (2018) found that VILI was more sensitive, but not less specific, compared with VIA (relative sensitivity = 1.11; 95% confidence interval, 95% CI, 1.06–1.16; relative specificity = 0.98; 95% CI 0.95–1.01). Co-testing was hardly more sensitive, but significantly less specific, than VILI alone. VILI to triage VIA-POSITIVE women was not less sensitive, but more specific, compared with VIA alone (relative sensitivity = 0.98, 95% CI 0.96–1.01; relative specificity = 1.04, 95% CI 1.02–1.05). Although imperfect, VILI alone appeared to be the most useful visual screening strategy.[10] In another study conducted by Sinha S et al (2018) observed that, the sensitivity of VIA and VILI was 88.23%, specificity 78.68%, positive predictive value was 53.57%, and negative predictive value was 96% with biopsy as the reference standard. The sensitivity and specificity of cytology in their study were 88% and 52.63%, respectively. VIA and VILI are simple, inexpensive, and low-technology test. Both when combined have high sensitivity as well as specificity.[11]

CONCLUSION

The present study concluded that the sensitivity of VIA and VILI was comparable to Pap smear. Hence, VIA and VILI can be used as an alternative for screening of carcinoma cervix in low resource settings like India.

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