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Comparative Analysis of VIA/VILI and Cytology as Cervical Cancer Screening Tools with Cervical Biopsy as Gold Standard

Medical Science

KEYWORDS : Colposcopy, Pap smear, Premalignant lesions of cervix.

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ABSTRACT

Aim: *The aim of this study was to assess the efficacy of Conventional Pap in cervical cancer screening by comparing it with VIA(Visual Inspection with Acetic acid) and VILI (Visual Inspection with Lugol's Iodine) using cervical biopsy findings as gold standard.*

Methods: *Cervical cytology specimens were collected from 200 women. They were later screened by VIA and VILI and the results were submitted for statistical analysis.*

Results: *The sensitivity was higher for VIA/VILI(94.55%). However the specificity was higher for Pap smear (94.55%). The positive predictive value and the percentage of false negatives were higher with Conventional Pap smear whereas the negative predictive value and the percentage of false positives were higher with VIA/VILI.*

Conclusions: *In conclusion, VIA/VILI can be used as an initial screening test for cervical cancer in a low resource country like India. Conventional Pap smear is a specific test for diagnosis of pre-invasive lesions of cervix.*

INTRODUCTION

Carcinoma cervix is the fourth most common cancer worldwide with an estimated incidence of 5,28,000 cases and 2,66,000 deaths in 2012 [1] . 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 respectively [2] . The 5 years survival rate is 90% for cervical cancer in the early stage whereas it is much lower (14%) for persons with advanced stage IV disease. Current resources about the natural history of cancer cervix suggest that there are two to five times women with potential precursors to cervical cancer such as those with invasive cervical carcinoma. This results in a rough estimate of 7,000,000 women around the world with high-grade dysplasia requiring detection and treatment.

Causes of screening failure in developing countries could be attributed to the fact that a number of women with cervical cancer do not turn up for investigations and hence are excluded from the cancer registry data resulting in considerably lower estimates of statistical parameters like cancer incidence, prevalence, and disease related mortality.

MATERIALS AND METHODS

This comparative analysis was a prospective study which was conducted at Institute of Social Obstetrics and Govt. Kasturba Gandhi hospital, Chennai, attached to Madras Medical College for a period of two years. This study involved women [n=200] attending the gynaecology outpatient department, who were screened for cancer cervix using Conventional Pap smear followed by colposcopic screening by VIA/VILI. and cervical biopsy done if either the colposcopy findings or cytology reports were suspicious. Ethical clearance for the study was obtained from the Institutional Ethics Committee of Madras Medical College, Chennai.

Inclusion criteria:

1. Women attending the colposcopy out patient department with symptoms of white discharge per vagina, abnormal uterine bleeding, postcoital bleeding, pruritis vulva and those with family history of gynaecological malignancy.
2. Women who are sexually active or on oral contraceptives.
3. Non pregnant women.
4. Both nullipara and multipara.

Exclusion criteria:

1. Pregnant women.
2. Menstruating women.
3. Women who had undergone hysterectomy.
4. Sexual intercourse with spermicidal jelly, douches/tampons 24 hours prior to pap smear examination.

Pap smear reporting in the hospital

1. Negative for SIL
2. Cervicitis
3. ASCUS- Atypical cells of undetermined significance
4. Atypical cells cannot exclude HSIL
5. Low grade SIL
6. High grade SIL
7. Invasive carcinoma

Interpretation of VIA/VILI results

(a) Low grade lesion

Detection of any acetowhite areas – VIA

Detection of any non iodine uptake areas – VILI.

(B) High grade lesion

Presence of opaque acetowhite patches which appear well circumscribed, abutting the squamocolumnar junction.

Detection of thick, dense, saffron yellow or mustard yellow iodine non-uptake lesions in the tranformation zone around the squamocolumnar juction.

Cervical biopsy

For 77 cases- 65 cases which showed abnormal results on either VIA/VILI or cytology and 12 normal cases (control), either punch biopsy or LLETZ biopsy was taken and sent for histopathological report. The biopsy reporting in our hospital is as follows.

1. No major lesion detected
2. Cervicitis
3. Mild Dysplasia-CIN 1
4. Moderate dysplasia-CIN 2
5. Severe dysplasia-CIN 3
6. Carcinoma in situ
7. Invasive Carcinoma

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RESULTS

The study was conducted at Institute of Social Obstetrics and Govt. Kasturba Gandhi Hospital for Women & Children, Chennai, which is a tertiary referral hospital, attached to Madras Medical College for a period of two years. 200 Patients were included in the study group and the outcome analysed using various parameters. The results were subjected to statistical analysis.

- Sample size – 200.
- Visual Inspection with Acetic Acid (VIA), done in all 200 patients.
- Visual Inspection with Lugol's Iodine (VILI) done in all 200 patients.
- Conventional Pap smear was done in all 200 cases.
- Those cases showing VIA/VILI Positive (or) cytology positive were subjected to cervical biopsy.
- For 12 cases which were negative on Pap smear and also on VIA/VILI, biopsy was done (as control)

Colposcopic findings:

68 cases were positive and 132 cases were negative on VIA/VILI. (Table 1)

TABLE 1: Distribution of VIA/VILI Positive Cases in the study group

VIA/VILI POSITIVE	68 CASES	34%
VIA/VILI NEGATIVE	132 CASES	66%

Conventional Pap Smear results:

150 cases were NSIL and 50 cases were positive for SIL. (Table 2)

TABLE 2: Conventional Pap Smear Results

FINDINGS	NUMBER OF CASES	PERCENT
INADEQUATE	7	3.5%
NORMAL	20	10%
ATROPHIC	8	4%
CERVICITIS	115	57.5%
ASCUS	2	1%
LSIL	11	5.5%
HSIL	18	9%
SCC	17	8.5%
ADENOCAR-CINOMA	2	1%

Findings in cervical biopsy:

Biopsy done in 77 cases. 65 cases either VIA/VILI or cytology positive. In 12 cases who were VIA/VILI negative and also negative on both conventional Pap smear, biopsy was done as control and results are tabulated below. (TABLE 3)

TABLE 3: Biopsy Results

FINDINGS	NUMBER OF CASES	PERCENT
CERVICITIS	22	28.5%
CIN 1	16	20.8%
CIN 2	14	18.2%
CIN3	6	7.8%
CIS	1	1.3%
SCC	16	20.8%
ADENO-CARCINOMA	2	2.6%

DISCUSSION

Cervical cancer is one of the leading causes of morbidity and mortality among women worldwide. Many studies revealed the association of human papilloma virus infection in both precancerous and invasive cervical cancer. Most of the HPV infection are transient, if it persists the risk of developing preneoplastic lesions increases as well as the risk of developing cervical cancer [7]. So effective screening is a must to lower the incidence of carcinoma cervix in the developing countries.

Findings on VIA/VILI:

VIA and VILI positive in 68 cases and in 132 cases the test results were negative. Thus 34% of the screening population showed positive results. The above findings correlated with the study conducted by Sankaranarayanan et al [3], in Kolkatta involving 5881 women which showed VIA positive results in 30%.

Liquid Based Cytology results:

3cases (1.5%) were inadequate, 20 cases (10%) normal, 9 smears (4.5%) were atrophic, 113 cases (56.5%) showed cervicitis, 15 cases (7.5%) were LSIL, 21 cases (10.5%) showed HSIL. 17 cases (8.5%) were squamous cell carcinomas and 2 cases (1%) were adenocarcinomas. In this study the rate of inadequate smears was 1.5%. In the study by M Tunc Canda et al [12], LiquiPrepTM smears were inadequate only in 0.1%.

Comparison of VIA/VILI results with biopsy:

Among the 20 low grade lesions, 8 were cervicitis, 10 were CIN 1 and 2 cases were diagnosed as CIN 3 on biopsy. 21 high grade lesions were reported CIN 1: 3 cases, CIN 2: 12 cases and CIN 3: 6 cases. Out of 19 cases of invasive carcinomas, 1 case was carcinoma in situ, 16 cases were reported as SCC and 2 cases were reported as adenocarcinoma on biopsy. The results are similar to the study conducted by Goel et al in 2005 [4] and Singh KN et al in 2010 [5].

Comparison of Conventional Pap smear results with biopsy:

3 inadequate smears were reported as CIN II- 2 cases and CIN III- 1 case. 2 cases of ASCUS were CIN I on biopsy. 11 cases of LSIL were given as CIN I-10 and cervicitis- 1. 18 cases of HSIL turned out to be CIN I- 2, CIN II-11, CIN III-5. 19 cases of invasive carcinoma were reported carcinoma in situ with focal microinvasion- 1, SCC- 16 and adenocarcinoma- 2 on biopsy. The results are similar to the study conducted by Divya Hedge et al in 2011 [6] (2011) and Shankaranarayanan et al in 2001[3].

Comparison of various screening procedures:

The sensitivity was similar for both VIA/VILI. However the specificity was higher for Conventional Pap smear. Negative predictive value and percentage of false positives were higher for VIA/VILI whereas the Positive predictive value and percentage of false negatives were higher for Conventional Pap smear. (TABLE 13).

Table 4: Comparison of efficacy of VIA/VILI and Conventional Pap smear as screening procedures

	VIA/ VILI	CONVENTIONAL PAP
SENSITIVITY	94.55%	89.09%
SPECIFICITY	63.64%	95.45%
PPV	86.67%	98%
NPV	82.35%	77.78%
PERCENTAGE O F FALSE POSITIVES	36.36%	4.55%
PERCENTAGE OF FALSE NEGATIVES	5.45%	10.91%

CONCLUSION

This correlative study of VIA/VILI and LiquiPrepTM smear with histopathological examination of cervix revealed that VIA/VILI had a higher sensitivity of 94.55% whereas Conventional Pap smear had a higher specificity than that of VIA/VILI.

In conclusion, VIA/VILI can be used as an initial screening test for cervical cancer in a low resource country like India. The false negative and false positive cases in this study can be minimized by proper screening and interpretation and further follow up by cytological smears.

REFERENCES

1. WHO/ICO Information centre on HPV and cervical cancer (HPV informationcentre).Human papilloma virus and related cancers in India. www.who.int/hpvcentre.
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. Sankaranarayanan R, Wesley R, Thara S et al. Visual inspection of cervix after application of acetic acid for the detection of cervical carcinoma and its precursors. Cancer 1998;83:2150-6.
4. Goel A, Gandhi G, Batra S, Bhambhani S, Zutshi V et al. Visual inspection of the cervix with acetic acid for cervical intraepithelial lesions. Int J Gynecol Obstet 2005; 88: 25-30.
5. Singh KN, More S. Visual inspection of cervix with acetic acid in early diagnosis of cervical intraepithelial neoplasia and early cancer cervix. J Obstet Gynecol India 2010; 60(1): 55-60.
6. Divya Hegde, Harish Shetty, Prasanna K Shetty, Supriya Rai, et al: Diagnostic Value of VIA Comparing with Conventional Pap Smear in the Detection of Colposcopic Biopsy Proved CIN. NJOG 2011 May-June; 6(1):7-12.