

RESEARCH

Comparison between pap smear and visual inspection with lugol's iodine (VILI) in screening of cervical intraepithelial neoplasia (CIN) and early cancer cervix

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ABSTRACT

Objectives: To screen the patient at Gynaecology Out Patient Department (GOPD) in the age group 18-60 yrs by doing pap smear, VILI (Visual Inspection with Lugol's Iodine) & to compare sensitivity and specificity of both for detecting Cervical Intraepithelial Neoplasia (CIN) & early carcinoma (Ca) Cervix. **Methodology:** 300 women (18- 60 yrs) who fulfill selection criteria underwent pap smear & VILI. In pap smear and/or VILI positive patients, cervical biopsy & histopathological examination were done. The sensitivity & specificity of each test were determined and compared. **Result & observation:** The positive results detected from cytology were 22, VILI was positive in 26 cases. The histology of 19 cases were suggestive of CIN & Ca Cervix. The sensitivity of VILI is 89% (versus pap smear-52%) the specificity of VILI is 96% (versus pap smear-95%). The accuracy of VILI is 96% compared to pap smear's 93%. **Conclusion:** The lack of effective & implementable screening programme leads to reporting of advanced cases of Ca Cervix. If detected at CIN or early Ca cervix stage, effective treatment can be provided with encouraging results. Therefore, effective, low cost, convenient & implementable Ca Cervix screening need to be provided in our country.

Keywords: Pap smear, VILI, CIN, Ca cervix.

Conflict of interest: None. **Disclaimer:** Nil.

Cervical cancer is the second most common cancer among women globally. With screening, vaccination, and political will, cervical cancer can be prevented [1-5]. The worldwide incidence of cervical cancer is approximately 510,000 new cases annually, with approximately 288,000 deaths worldwide [6]. More than 85% cases and

88% deaths from cancer cervix occur in developing countries, where women often lack access to cervical cancer screening and treatment [7, 8]. India alone accounts for one-fourth of the global cancer cervix burden [7].

Invasive cervical cancer is preceded by a long phase of precancerous lesion that can be detected

Received: 1st April 2015. **Accepted:** 28th April 2015.

Nath JD, Bhattacharjee AK, Deka H. Comparison between pap smear and visual inspection with lugol's iodine (VILI) in screening of cervical intraepithelial neoplasia (CIN) and early cancer cervix. The New Indian Journal of OBGYN. 2015; 2(1):27-31.

by screening and treated effectively by simple treatment, which prevent invasive cancer. The cytology based screening is effective but costly. There is difficulty in reporting in periphery as cytologists are not readily available. Moreover the patient needs to come back for report with possibility for loss to follow up.

Hence, one simple low technique screening tests namely visual inspection with lugol's iodine (VILI) which is based on the ability of the trained health care personnel to detect yellow non iodine uptake areas in the cervical transformation zone are currently being evaluated in the experimental setting as potential alternative to cervical cytology. So, the present study is done to screen patients coming to GOPD at the age of 18-60 years by Pap smear and VILI and to detect specificity and sensitivity of each test for detecting CIN & Ca Cervix by comparing with the histology from positively screened women in all two.

Methodology

The present study was conducted in the Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, Guwahati between June 1st 2012 to May 31st 2013 at GOPD. This was a Cross-sectional study conducted in 300 women (18-60 years) who fulfill selection criteria after taking proper consent. The average number of women who attended GOPD was 60 per day. Among them, women who fulfilled selection criteria were randomly selected.

Inclusion criteria - Patient in age group (18-60years) were taken into study and priority was given to patients having following risk factor: early marriage, early pregnancy (teenage pregnancy), sexual activity at early age, multiparity, multiple sexual partners, women with sexually transmitted disease (STD), leucorrhoea, abnormal vaginal bleeding.

Exclusion criteria - Unmarried patient, patients with bleeding per vagina (P/V) and active infection at the time of examination, women with frank invasive cervical cancer.

Pap smear positive cases were considered as CIN 1 or above. VILI was considered to be positive on detection of yellow iodine non-

uptake areas in the transformation zone or close to touching squamocolumnar junction. The positive cases were sent for biopsies and histological evaluation.

The results are expressed in tables and percentage. The sensitivity & specificity of each test are determined and compared by using GraphPad InStat 3 version of software.

Results and Observations

Positive results obtained from cytology were 22. Visual Inspection with Acetic acid (VIA) was positive in 52 women and VILI positive in 26. Cervical biopsy was done in 62 women who had positive results (10 were positive with all three tests, 4 were positive with VIA and Pap smear, 14 were positive with VIA and VILI. 24 were positive with only VIA, 2 were with only VILI and 8 were positive with only Pap smear). Visual Inspection with Acetic Acid (VIA) is added to make the study broad based. Histology in 19 was suggestive of CIN and carcinoma.

Table 1: Relation with age

Age group (Years)	CIN	Ca Cervix	Total
18-29	1(3%)	-	42(14%)
30-39	1(3%)	-	102(34%)
40-49	8(24%)	1(3%)	108(36%)
50-59	6(18%)	2(6%)	48(16%)

In our study 14% cases are in age group 18-29 yrs, 34% in age group 30-39 yrs, 36% cases in age group 40-49 yrs and 16% cases in age group 50-59 yrs. 3% cases in age group 18-29 yrs, 3% cases in age group 30-39 yrs, 24% cases in age group 40-49 yrs, 18% cases in age group 50-59 yrs has CIN. In our study CIN is highest in age group 40-49 yrs. Incidence of pre-invasive cancer is more in 50-59 yrs group (6%).

Table 2: Relation with literacy

Literacy	CIN	Ca Cervix	Total
Illiterate	9	2	156
Literate	7	1	144

In our study 156 (52%) cases were illiterate and 144 (48%) cases were literate. Incidence of Ca cervix is 6% in illiterates and 3% in literates. The literacy has not found to affect the result.

Table 3: Relation with duration of marriage

Category	≤ 10 years	11-20 years	>20 years
CIN	0	6	10
Ca Cervix	0	1	2
Total	21	129	150

In our study 21 cases are married for less than 10 yrs, 129 cases are married for 11-20 yrs, 150 cases are married for more than 20 yrs. The highest number of CIN cases (30%) and Ca cervix (6%) are in group married for more than 20 yrs.

Table 4: Relation with socioeconomic status

Category	Low	Middle	High
CIN	10	6	0
Ca Cervix	1	2	0
Total	180	108	12

In our study 180 cases belong to low socioeconomic class, 108 cases belong to middle class and 12 cases belong to high class. Incidence of CIN is found to be higher (30%) in low socioeconomic class. As the number of cases detected as Ca cervix is low, it is difficult to comment on the effect of socioeconomic status in Ca cervix.

Table 5: Relation with age at marriage

Age at marriage	Total cases	CIN	Ca Cervix
≤ 18 yrs	243	14	2
.18 yrs	57	2	0

In our study 243 cases were married at the age of 18 yrs or less and 57 cases were married at more than 18 yrs of age. Incidence of CIN was more (45%) in the cases of married at 18 yrs or less and incidence of Ca cervix is 6% in the early marriage group. No case is detected in above 18 yrs group.

Table 6: Relation to parity

Category	≤ P ₂	□ P ₂
Total	45	255
CIN	1	15
Ca Cervix	1	2

In our study 45 cases has parity 2 and 255 cases with parity more than 2. Incidence of CIN cases is more with parity more than 2 (45%).

Table 7: Sensitivity and specificity of Pap smear with Cervical Biopsy report

Variable	Value
Sensitivity	52%
Specificity	95%
+ ve predictive value	45%
-ve predictive value	96%
% of false positive value	4%
% of false negative value	47%
Accuracy	93%

Table 8: Sensitivity and specificity of VILI with Cervical Biopsy report

Variable	Value
Sensitivity	89%
Specificity	96%
+ ve predictive value	65%
-ve predictive value	99%
% of false positive value	3%
% of false negative value	10%
Accuracy	96%

Discussion

In the present study, high incidence of CIN was found in the age group of 40-49yrs (36%). Juneja A et al 1993 [9] reported CIN in > 40yrs of age. Age above 30 years was reported by Kushtagi P et al (10) whereas Sherwani RK et al in 2007 reported the incidence of CIN in age above 31year.

In the present study it was found that incidence of CIN is more in cases with parity >2(54%). Also there are no cases of ca cervix in parity 2 or less but its incidence is 6% in cases with parity more than 2. So also the incidence of ca cervix increases with parity more than 2 (6%) which is similar to a study done by Kusthagi P and Fernandes P in 2002 [10]

As the number of cases detected as ca cervix is low, it is difficult to comment on the effect of socioeconomic status in ca cervix but in the present study, it was found that the incidence of CIN was higher in lower socio-economic class (30%) along with increased incidence of carcinoma cervix in this group (3%). The factor responsible for higher incidence of CIN and ca cervix in lower economic group include poor personal hygiene, poor living condition,

illiteracy, unstable marriage, early age at first intercourse.

Duration of marriage and duration of exposure to sexual intercourse has an important role in the genesis of cervical dysplasia. In our study, the highest number of CIN cases (30%) and ca cervix (6%) are in the age group married for more than 20yrs. It was also found earlier the age of, marriage (age<18) more is the incidence of CIN.

Positive results obtained from Pap smear were 7.3% (22). Sensitivity of Pap smear was found to be low - 52% compared to specificity which was 95%. This was attributed to high number false negative smear. In below mention table (9), the specificity and sensitivity of pap smear of the present study were compared to some of the previous studies [11, 12, 13,14].

Table 9. Findings of previous studies

Study	Sensitivity	Specificity
Londhe M et al 1997	13.2%	96.3%
Basu PS, Sankarnarayanan 2004	29.5%	92.3%
Gosh P et al 2012	52.6%	99%
Shuchi C et al 2012	84.2%	62.1%

VILI was positive in 8.7% (26) cases out of 300 cases. Sensitivity of VILI was found to be 89% compared to specificity which was 96%. In table (10), the specificity and sensitivity of VILI of some other study were mentioned [13,14,15,16].

Table 10. Findings of previous studies

Study	Specificity	Sensitivity
Sankarnarayanan et al (2003)	85.4%	91.7%
Samir Khan et al (2007)	74.4%	78.9%
Shuchi C et al (2012)	75.9%	89.5%
Ghosh P (2012)	93.3%	100%

In the present study comparison was done among Pap smear and VILI with histopathology. The sensitivity of VILI was found to be 89% (versus Pap smear which had 52%) and specificity of VILI is 96% (versus Pap smear which had specificity of 95%). Thus VILI showed higher sensitivity compared to Pap

smear. VILI has almost equal specificity as compared to Pap smear.

Conclusion

The lack of effective screening programme leads to reporting of very advanced cases of ca cervix where the mortality & morbidity is very high. Pap smear screening needs good infrastructure, trained manpower to make & interpret the slides which is not feasible considering the facilities available in the periphery. The patient also usually does not come back to collect the report and may be lost to follow up. There is also interpersonal interpretation variation in case of Pap smear. However, VILI can be done even by sisters in the remotest place with minimum facilities & patient is diagnosed. So, patient compliance is also better. From the results of this study, it is evident that VILI is more sensitive than Pap smear and specificity of VILI is equal to Pap smear. Thus by combining VILI along with Pap smear we can maximize the sensitivity and specificity of cancer cervix screening, which are more cost effective and practically implementable.

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