Cross-sectional Study on Visual Inspection with Acetic Acid and Pap Smear Positivity Rates According to Sociodemographic Factors Among Rural Married Women of Bareilly (Uttar Pradesh)

Ruchi Arun, Jai Prakash Singh, Shyam Bihari Gupta

Department of Community Medicine, SRMS Institute of Medical Sciences, Bareilly, Uttar Pradesh, India

Abstract

Background: It is possible to prevent deaths due to cervical cancer through screening and treatment. Cervical cytology which is a standard screening tool in developed countries fails as a screening method in low-resource countries due to financial and technical constraints. **Objective:** To determine the prevalence of pre-malignant lesions of the cervix by VIA and Pap smear test among rural married women and to find out association of socio demographic factors with positive screening test results. **Method:** A community based cross-sectional study was carried out among rural married women in the field practice area of a tertiary health care center. A pre-designed questionnaire was administered to collect information on socio-demographic characteristics from 550 women. They were tested for the presence of pre-malignant lesions of the cervix using VIA and Pap smear as screening tools. **Results:** Out of 550 study participants, total 37 patients were found positive, out of which 7, 17 & 13 patients were found positive by Pap smear alone, VIA test alone, and by both these tests respectively. Moderate agreement (k=0.498) was found between these two tests by applying Kappa statistics at 95% confidence interval. The VIA and Pap smear tests were positive among 5.5% and 3.6% study subjects respectively. The positivity rate was found to be more in the age group of >50 years, Hindu, SC/ST caste, joint family, professional and, upper class. **Conclusion:** The prevalence of pre-malignant lesions of the cervix by VIA test was 5.5% while 3.6% pre-malignant lesion was detected by Pap smear method. VIA and Pap smear positivity rates among rural married women.

Keywords: Cervical cancer, pap smear, premalignant lesion, screening, visual inspection after Acetic acid

Introduction

Cervical cancer in India is the second-most common cancer in women (12.1%). Every year, around 1.23 lakh new women are diagnosed with cervical cancer and 67,500 of these women die of the disease in India (Globocan 2012).[1]

Cervical cancer is a preventable disease as it can be diagnosed in its precancerous stage. Screening by cervical cytology is the most common method used in developed country for detection of the disease in an early stage. The cytology screening program has failed in developing world due to financial constraints, lack of political will, poor organizational backup, lack of expertise, and lack of prioritization.[2] Prompted by the need for optimal strategies of cervical screening in low resource settings, the role of Pap smear examination and visual inspection of the cervix with acetic acid (VIA) has been widely studied. These

techniques are less expensive and simpler to perform and can be mastered in a short period by the health workers. They can provide the results immediately which make them suitable for the wide screening in regions with a high incidence of cervical cancer.[3]

At present, National Program for the Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke is also started to enable opportunistic screening for cervical cancer by

Address for correspondence: Dr. Jai Prakash Singh,
Plot No. 166, Saket Nagar, Lanka, Varanasi, Uttar Pradesh, India.
E-mail: jpsingh0001@rediffmail.com

Access this article online

Quick Response Code:

Website:
www.ijcm.org.in

DOI:
10.4103/ijcm.IJCM_73_17

VIA, at District, and community health centers levels, through the setting up of non-communicable disease clinics.

Cervical cancer has a major impact on woman's lives worldwide and most of the cervical cancer cases are diagnosed late leading to poor outcomes. The women are examined, especially vagina, by conducting the VIA and Pap smear method to detect precancerous lesions to allow early treatment and thus prevent these from evolving into cancerous lesions.

Very few such studies have been done in India, Uttar Pradesh and none in Rohilkhand region, to detect premalignant lesions of the cervix using VIA or Pap smear. Hence, considering the above-mentioned facts, the present study was carried out at Rural Health Training Centre, of a medical college from this region.

Aim and objectives
- To conduct VIA and Pap smear examination of eligible married women of rural area
- To find out socio-demographical factors associated with positive screening test results.

MATERIALS AND METHODOLOGY

The present cross-sectional study was carried out during 2014–2016 in the area of Rural Health Training Centre, under the Department of Community Medicine. The study protocol was reviewed and approved by institutional review and ethics committees. A sample size of 550 patients was selected for an estimated prevalence 12% of premalignant lesions of cervix in the Hegde *et al.*[4] and assumed relative error was 23%, the precision was found 2.72%.

The rural health training center (RHTC) comprised of 24 villages, of which, one village Dhaura was randomly selected in the first stage. The second stage of sampling was done for selection of households. All the houses of the selected village were numbered and 1st house was randomly selected by drawing a random number. Thereafter, consequent houses were visited for the collection of the data. All the eligible study participants present during the visit in those household were studied. The subject were explained the symptoms, risks of cervical cancer, and benefits of screening test. They were motivated to undergo gynecological check-up including VIA and Pap Smear test. Those who consented were administered questionnaire comprising of sociodemographic history.

After filling the questionnaire, the eligible women were given date and time to visit outpatient department at RHTC for per speculum examination. Per speculum examination was done to visualize the cervix, the external os was identified with pinkish squamous epithelium and reddish columnar epithelium and transformation zone. The condition of the cervix and vagina was noted down.

Inclusion criteria
Rural married Women, who give consent for the study.

Table 1: Comparison of degree of agreement between pap smear results and visual inspection with acetic acid test in the study population

Pap smear	VIA		
	Positive	Negative	Total
Positive (include ASCUS LSIL and HSIL)	13	7	20
Negative (NILM)	17	513	530
Total	30	520	550

VIA: Visual inspection with acetic acid, ASCUS: Atypical squamous cells of undetermined significance, LSIL: Low-grade squamous intraepithelial lesions, NILM: Negative for intraepithelial lesions or malignancy, HSIL: High-grade squamous intraepithelial lesions

Exclusion criteria
Pregnancy women with posthysterectomy status, active vaginal bleeding, seriously ill and those not willing to participate in the study.

Pap smear and visual inspection of the cervix with acetic acid test
First, Pap smear test was done on the subject. Pap smear was taken from two samples from ecto/endo cervix. The Pap smear slide was immediately fixed with a mixture of 50% ethyl alcohol and 50% ether. Thereafter, each woman was subjected to VIA. Using a cotton swab soaked in 5% acetic acid for 1–2 min and then the cervix was carefully inspected for any acetowhite lesions, particularly in the transformation zone. The test outcome was considered positive if any distinct acetowhite area was detected on the cervix. If no acetowhite lesions areas were detected or if the whitish appearance was doubtful or faint, the test was scored as negative.

Reporting of the slide was done according to Bethesda Classification[5] which is as follows:
- NILM – Negative for intraepithelial lesions or malignancy, ASCUS-Atypical squamous cells of undetermined significance, LSIL – Low-grade squamous intraepithelial lesions, and HSIL – High grade squamous intraepithelial lesions.

Data compilation and analysis
Data were entered into excel spreadsheet. It was compiled, and analysis was done with the help of percentages and Chi-square test.

RESULTS

Out of 550 study participants, 37 patients were positive, out of which 7 patients were positive by Pap smear alone, 17 patients by VIA test alone, and 13 patients by both tests. Kappa statistics at 95% confidence interval was 0.498 indicating moderate agreement [Table 1]. Positivity rates were progressively increasing with age and the associations between positivity rates with age group was highly statistically significant ($P < 0.05$). Positivity rates among Hindus (9.8%) were more than Muslim (2.9%)

subjects and the association between positivity rate and religion was statistically significant. The positivity rates were reported 12.7%, 6.8%, and 5.6% among SC/ST, general caste, and OBC caste, respectively and the association with caste was not significant ($P > 0.05$). Majority individuals were illiterate 257 (46.7%). In general, positivity rate of screening tests increases as literacy rate increases, but in this study, high positivity rate was reported in the individuals of intermediate and above education (18.2%) while low among illiterates (3.9%) and primary school (2.7%) and the association was found statistically significant. The positivity rates were significantly high among un-skilled (26.1%) and professional group (20.0%) than other group of occupation. Positivity rate among joint family subjects (22.2%) was high in comparison to nuclear family (6.5%) and the association was not significant.

According to socio-economic status of the study participants, positivity rate was high in upper class (50.0%) followed by upper middle (13.3%) and middle-class family (7.9%) and the association was statistically significant [Table 2].

DISCUSSION

In this present study, the VIA positivity rate was found to be 5.5% and Pap smear positivity rate was 3.6%. Results of the present study are aligned with Makuza *et al*.,[6] who reported VIA positivity to be 5.9%. However, the hospital based study carried out by Hegde *et al*.,[4] in Karnataka showed very high VIA and Pap smear positivity rate (12% and 11.5%). This may be due to the regional variation, difference in methodology adopted and difference in the age group taken for the study.

The present study depicted that VIA positivity rate was highest in the age group above 40 years. Results of the present study show that VIA and Pap smear positivity rate increases with the age ($P < .001$). Similar results were also found in Bhattacharyya *et al*.[7] and MakuzaJ. D., *et al*.[5] study, in which the VIA positivity rate was also found to be highest in the age group of 40 years and above.

VIA and Pap smear positivity rate was higher in Hindus (7.5% and 5.5%) than Muslims (2.9% and 1.2%) ($P < 0.01$). The higher prevalence in Hindu was also reported by Paul *et al*.[8] study. The lower prevalence of Ca cervix in this present study in Muslim population may be due to the ritual of circumcision in males among Muslims.

Surprisingly, VIA positivity rate was highest in women educated up to intermediate and above but number of study subjects in these group was very low. No statistically significant association between VIA positivity rate and educational level has been seen in this present study ($P > 0.05$). The same pattern of VIA positivity rate was also reported by the Bhattacharyya *et al*.[7]

No VIA and Pap smear positive cases were found in professional and unskilled groups in the present study. This

Table 2: Visual inspection with acetic acid and pap smear positivity rate according to Sociodemographic profile of the study subjects			
Sociodemographic profile	Women studied (n=550)	Positivity rate (n=37) (%)	Statistical value
Age group			
≤20	186	2 (1.1)	Yates χ^2=41.7
21-30	100	4 (4.0)	df=4
31-40	162	9 (5.5)	Yates P<0.05
41-50	52	10 (19.2)	
>50	50	12 (24.0)	
Religion			
Hindu	306	30 (9.8)	χ^2=10.4
Muslim	244	7 (2.9)	df=1, P<0.05
Caste			
OBC	355	20 (5.6)	χ^2=4.3
SC/ST	63	8 (12.7)	df=2
General	132	9 (6.8)	P>0.05
Education			
≥ Intermediate	11	2 (18.2)	Yates χ^2=22.0
High school	47	8 (17.0)	df=4
Middle school	85	13 (15.3)	Yates P<0.05
Primary school	150	4 (2.7)	
illiterate	257	10 (3.9)	
Occupation			
Professional	10	2 (20.0)	Yates χ^2=13.2
Clerical/shop owner/farmer	105	8 (7.6)	df=4
			Yates P<0.05
Skilled	51	2 (3.9)	
Semi-skilled	361	19 (5.3)	
Un skilled	23	6 (26.1)	
Type of family			
Nuclear	541	35 (6.5)	Yates χ^2=1.4
Joint	9	2 (22.2)	df=1
			Yates P>0.05
Socioeconomic class			
Upper	8	4 (50.0)	Yates χ^2=23.6
Upper middle	15	2 (13.3)	df=4
Middle	314	25 (7.9)	Yates P<0.05
Lower middle	136	2 (1.5)	
Lower	77	4 (5.2)	

may be because of very low number of study subjects in these two occupational groups. VIA positivity rate was relatively higher in women belonging to clerical/shopkeeper/farmer group ($P < 0.01$). However, Pap smear positivity was highest in semi-skilled groups.

There were less VIA and Pap smear positive cases found in study subjects residing in the nuclear family in the present study. Higher VIA positivity rate (33.3%) and Pap smear positivity (11.1%) was observed in subjects of the joint family. The possible factors may be illiteracy, ignorance, and low socioeconomic status for such pattern ($P < 0.01$).

In this present study, there were very few study participants in upper class with a high Pap smear positivity rate of (25.0%).

Similar observation had been seen in Mhaske *et al.*[9] study in which the Pap smear positivity rate was high (33.3%) in upper-class socioeconomic status ($P < 0.001$). Their study too showed statistically significant association between the socioeconomic status and cervical dysplasia.

Conclusion

In this study, the prevalence of premalignant lesions of the cervix among rural married women was 5.5% and 3.6% by VIA and Pap smear test, respectively. The degree of agreement between these two tests was moderate. As there is no baseline data on prevalence of premalignant lesions of the cervix among women from this area, further research studies are needed in this direction.

Limitations

The investigator found it difficult to convince the women for cervical screening as many women did not give consent due to poor awareness, social stigma and fear associated with the diagnosis of cancer.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, *et al.* GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC Cancer Base No 11. Lyon, France: IARC; 2013. Available from: http://www.globocan.iarc.fr. [Last accessed on 2017 Oct 02].
2. Yadav K, Patidar M, Bhargava M. A prospective study for evaluating visual inspection after Acetic acid (VIA) and Lugols iodine (VILI) application in screening of premalignant lesions of cervix. J Evol Med Dent Sci 2013;2:310-4.
3. Mehta A, Ladola H, Kotadiya K, Edwin R, Patel V, Patel V. Study of high risk cases for early detection of cervical cancer by Pap smear and VILI. NHL J Med Sci 2013;2:65-8.
4. Hegde D, Shetty H, Shetty PK, Rai S. Diagnostic value of acetic acid comparing with conventional Pap smear in the detection of colposcopic biopsy-proved CIN. J Can Res Ther 2011;7:454-8.
5. Salhan S. Bethesda system of grading of cervical cancer. Text Book of Gynaecology. 1st ed. New Delhi, Jaypee Brothers Medical Publishers Private Ltd.; 2011. p. 311-2.
6. Makuza JD, Nsanzimana S, Muhimpundu MA, Pace LE, Ntaganira J, Riedel DJ, *et al.* Prevalence and risk factors for cervical cancer and pre-cancerous lesions in Rwanda. Pan Afr Med J 2015;22:26.
7. 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.
8. Paul SB, Tiwary KB, Chaudhury AP. Studies on the Epidemiology of Cervical Cancer in Southern Assam. Assam Univ J Sci Technol Biol Environ Sci 2011;7:36-42
9. Mhaske M, Jawadekar SJ, Saundale SG. Can visual inspection with acetic acid be used as an alternative to pap smear in screening cervical cancer. Indian J Community Med 2005;2:187-90.