



Research Paper

A Study for early Diagnosis of Cin and Early Cancer Cervix in Kamla Raja Hospital, Gwalior - Visual Inspection of Cervix with Acetic Acid as Screening Test

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Abstract

Background: Visual inspection of cervix after acetic acid is widely recommended at the method of choice in cervical cancer screening programme in resource - limited settings because of its simplicity and ability to link with immediate treatment. Cervical cancer is the second most common cause of cancer selected morbidity and mortality among women in developing countries.

Method: The present study conducted from January 2017 to January 2018 on 200 patients was carried out in Department of Obstetrics and Gynaecology OPD and indoor admitted patients on women above the age 18 years.

Results: Majority of population belongs to the middle age group (25-45 yrs), and the mean of age of patients was 38.2 years. On comparison of cytology and VIA, VIA was 87.5% sensitive and 86.45% specific, the positive predictive value (PPV) was only 21.21% whereas pap smear was 62.50% sensitive and 96.87% specific and PPV was 45.45%.

Conclusion: The majority of women in India, who belongs to the low socio economic status, pap smear is unaffordable to them. The time has come, to integrate VIA based screening programmes at the primary care level of health services, and to downstage cancer cervix in our country.

Introduction

Visual inspection of cervix after acetic acid is widely recommended at the method of choice in cervical cancer screening programme in resource - limited settings because of its simplicity and ability to link with immediate treatment.¹

Cervical cancer is the second most common cause of cancer selected morbidity and mortality among women in developing countries (LMIC) account for 4/5th of the estimated 500,000. New cervical cancer cases and 300,000 deaths annually, yet no

effective method of screening exist in most of them.²

Cervical cancer is a major health problem worldwide cervical malignancy is the most common malignancy among Indian women with an incidence of 134,420 cases and mortality of 72,825 cases in the year 2008.³

Cervical cancer is an emotive disease and multiple connotations.

The life time estimated risk of cervical cancer is 2-4%.⁴

In Indian common cervical malignancy accounts for 26.1%-43.8% of all cancers.⁵

There were as estimated 327600 new cases and 265,700 deaths worldwide in 2012.⁶

Screening aims to detect the disease at the precancerous stage when it is amenable to simple treatment and cure. This reduction in mortality through screening is due to

1. An increase in the detection of invasive cancer at early stages when the 5 years survival rate is approx. 92%.⁷
2. The detection and treatment of preinvasive lesions which reduces the overall incidence of invasive cancer.⁸

Cervical cancer is preceded by a long phase of premalignant cytological changes.

Natural history of carcinoma cervix begins with minor histological atypicalities arising at the squamocolumnar junction over a period of years under preventable influencing factors. The degree of atypia increase and slowly progresses through at a spectrum of changes from minor dysplasia to carcinoma in situ to frank cancer.⁹

Cervical cancer can be prevented if cellular changes are detected and treated in early stage.

In developed countries, the incidence of cervical cancer has decreased, due to screening, early detection and early treatment of precancerous lesions.¹⁰

The reasons for higher prevalence of cervical cancer in developing countries are a lack of resources, lack of awareness, lack of effective screening programme and poorly organized health system aimed for detecting precancerous condition.¹¹

In developing countries, 80% of cervical cancers are incurable at the time of detection due to advanced stage. Hence, there is a need for low cost mass approach for effective cervical cancer screening programme.¹²

Cytology based screening programmes have been difficult to implement on a large scale basis in developing countries with little impact on the incidence of cervical cancer and mortality.¹³

Laboratory, infrastructure, counselling followup and logistics including technical expertise may not be available in low resource setting.

This has led to the development of multiple low cost, based technologies as down staging gynoscropy, visual inspection of cervix after application of acetic acid and Lugol's iodine. This would over come the barriers posed by cytological screening.

Visual inspection of cervix with acetic acid has several screening advantages. Minimal requirement of infrastructure and equipments, immediate results, preliminary screening of high risk cases for referral and also several studies indicate that visual inspection of cervix with acetic acid has an ability, nearly equivalent to or better than that of cervical cytology to detect cervical cancer at the earliest.¹⁴

Aim

1. To assess the role of VIA as an alternative to cytology in screening for cervical cancer.
2. To study the socio-economic factors associate with precancerous lesions of cervix and high risk for cancer cervix.

Material and Method

The present study was carried out in Gajra Raja Medical College in the Department of Obstetrics and Gynaecology OPD and indoor admitted patients.

Period - January 2017 to January 2018

Number of cases studied = 200

Inclusion Criteria: All married women above the age 18 years.

Exclusion Criteria

1. Patient using COC
2. Immunosuppression
3. During menstruation
4. Women with amputated cervix
5. Pregnant women
6. Unmarried
7. Invasive carcinoma cervix

Observations

Table No. 1 Age wise distribution of Rural and Urban population (n=200)

Age group (in yrs)	Rural	%	Urban	%	Total
18-25	7	30.43	16	69.56	23
26-35	29	47.54	32	52.45	61
36-45	27	29.67	64	70.32	91
46-55	8	50	8	50	16
>55	5	55.55	84	44.44	9
Total	76	100	124	100	200

In the present study urban population is more than the rural population.

Table No. 2 Distribution of pap smear test results in rural and urban population

Pap smear	Rural	%	Urban	%	Total
Positive	5	6.57	7	5.64	12
Negative	68	89.47	113	91.12	181
Report missing	3	3.94	4	3.22	7
Total	76	100	124	100	200

Table No. 3 Correlation of occupation and VIA positive cases

Occupation	VIA positive	Percentage	VIA negative	Percentage	Total
Unskilled	26	78.78	112	67.06	138
Semiskilled	4	12.12	21	25.14	25
Skilled	1	3.03	31	18.56	32
Unemployed	2	6.06	3	1.76	5
Total	33	100	167	100	200

The unskilled population showed more VIA positive cases.

Table No. 4 Correlation of occupation and Pap smear reporting

Occupation	NILM	ASCUS	LSIL	HSIL	Invasive cancer	Report missing	Inadequate smear
Unskilled	121	3	2	1	1	2	2
Semiskilled	21	2	1	-	-	-	-
Skilled	30	-	-	-	-	-	-
Unemployed	5	-	-	-	-	-	-
Total	183	5	4	1	1	3	2

The above table shows that the preinvasive lesions were more common in the unskilled population. Positive pap smear report was present in 11 cases,

3-ASCUS, 2-LSIL and 1-HSIL were among the unskilled group. 63.63% positivity was seen in unskilled population.

Table No. 5 Distribution of women according to education

Education	No. of women	Percentage (%)	VIA positive case	Percentage (%)
Illiterate	116	58	24	72.72
Primary	27	13.5	3	9.09
Middle	17	8.5	2	6.06
High School	16	8	2	6.06
Higher secondary	16	8	1	3.03
Graduation	6	3	1	3.03
Post Graduate	6	1	-	-
Total	200	100		100

58% of women in this study group were illiterate and out of which 72.72% shows VIA positivity.

Table No. 6 Distribution of cases according to income

Income (in rupees)	No. of cases	(%)	VIA Positive Case	(%)
<1000	124	62	24	72.72
1000-3000	62	31	5	15.15
3000-5000	12	6	3	9.09
>5000	2	1	1	3.03
Total	200	100	33	100

Majority of population (62%) in our study, have economic group and out of which 72.72% were income <1000 and belong to the low socio VIA positive.

Table No. 7 Distribution of parity and VIA test results in the population

Parity	VIA positive	%	VIA Negative	%	Total
P0	1	3.03	9	5.38	10
P1	3	9.09	24	14.37	27
P2	7	21.21	58	34.73	115
P3	8	24.24	52	31.13	110
P4	8	24.24	18	10.77	22
P5	4	12.12	7	4.19	11
P6	2	6.06	3	1.79	5
Total	33	100	167	100	200

VIA positive cases were common in women with three or four children.

Table No. 8 Distribution of cases according to presenting complaints and correlation with VIA

VIA	Complaints										Total
	1	2	3	4	5	6	7	8	9	10	
Positive	9	7	1	4	2	1	1	4	1	5	33
Negative	44	39	9	21	8	-	-	8	11	27	167
Total	54	48	13	29	15	7	8	20	21	42	200

- | | |
|--|---|
| <ol style="list-style-type: none"> 1) White discharge 2) Pain in lower abdomen 3) Backache 4) Irregular menses. 5) Urinary complaints (↑ Frequency of micturition, burning micturition) 6) Blood mixed discharge. 7) Post menopausal bleeding | <ol style="list-style-type: none"> 8) Itching in private parts 9) For check up. (asymptomatic) 10) Others (Secondary infertility, something coming out P/V, dysmenorrhea, amenorrhea etc.) |
|--|---|
- Majority of VIA positive cases had white discharge or pain in lower abdomen as their presenting complaints.

Table No. 9 Distribution of cases according to per speculum examination and correlation with VIA

VIA	Per speculum examination								Total
	1	2	3	4	5	6	7	8	
Positive	2	15	9	1	2	2	1	1	33
Negative	76	46	25	2	-	-	9	9	167
Total	78	61	34	3	2	2	10	10	200

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Cervix vagina healthy 2. Cervical ectropion 3. Cervix hypertrophied 4. Cervical growth/polyp 5. Cervix flushed with vagina 6. Cervix atrophied | <ol style="list-style-type: none"> 7. Curdy white discharge 8. Others |
|--|---|
- Majority of patients who were VIA positive either had cervical ectropion or a hypertrophied cervix.

Table No. 10(A) Comparison and correlation of VIA with cytology

VIA	NILM	Pap smear reporting				Report missing	Inadequate smear	Total
		ASCUS	LSIL	HSIL	Invasive			
Positive	22	4	4	1	1	1	-	3
Negative	155	1	-	-	-	6	5	167
Total	177	5	4	1	1	7	5	200

ASCUS, LSIL, HSIL, invasive cancer were considered positive on pap smear.

On comparing the results of VIA and pap smear. Only 1 case positive on cytology were not

detected by VIA- (1 ASCUS). 4 ASCUS, 4 LSIL, 1 HSIL, 1 invasive cancer were positive on VIA had a high detection rate for lesions positive on cytology 90.90%

Table No. 10(B) Comparison and correlation of VIA with pap smear

Pap smear	VIA		
	Positive	Negative	Total
Positive	10	1	11
Negative	23	166	189
Total	33	167	200

11 cases were positive on Pap smear and 33 cases were positive on VIA. Only 1 case positive on Pap

smear were missed by VIA. Thus VIA is more sensitive than pap smear.

Table No. 11 Comparison of VIA with cytology according to sensitivity, specificity and positive predictive value

Test	Sensitivity	Specificity	Positive predictive	Negative predictive
VIA	87.5%	86.84%	21.21%	99.40%
Pap smear	62.50%	96.87%	45.45%	98.41%

Sensitivity of VIA is more than pap smear. Hence it is more accurate for screening out, the true positive cases.

Specificity and positive predictive value of pap is more than VIA.

Discussion

This study is based on comparison and correlation of VIA with cytology on the basis of sensitivity, specificity and PPV.

Patient with positive VIA were selected for colposcopy and some test negative patients also selected for colposcopy.

Histopathology was taken on the reference standard test. Biopsy was indicated according to the colposcopy findings.

The gold standard test in deciding the patient who have the disease was cervical biopsy (histopathology).

Age

In present study, all women above 18 years of age were taken. The mean age of women was 38.2 years.

In a study conducted in Kerala, 3000 women were screened (1996-1997), the mean of population was 43.4 years.¹⁵

In a study done by Goel et al¹⁶ where the study participants belonged to age group of 30-40 years and in Khan et al¹⁷ study from 25-65 years.

Parity

In Kerala study, majority of population had > 3 children in our study. VIA positive cases are having > 2 children.¹⁵

Impact of socioeconomic status

Present study shows that majority of VIA positive cases were illiterate (72.72%) and 78.78% cases are unskilled and 62% were belongs to low socioeconomic status.

Comparison and correlation with Paps smear (cytology)

The sensitivity and specificity for the cytology in the study of Khan S et al¹⁸ were 52.6% and 72.1% respectively as compared to that of Cronje¹⁹ in 2001 with sensitivity of 19.3% and specificity of 99.3%.

In our study

Test	Sensitivity	Specificity	Positive predictive	Negative predictive
VIA	87.5%	86.84%	21.21%	99.40%
Pap smear	62.50%	96.87%	45.45%	98.41%

VIA is more sensitive but usually less specific than cytology. The results of the current study and other reported studies indicate that VIA is simple objective test. The result of this procedure positive or negative is available immediately, allowing an algorithm of further investigations to be carried out for the identification of cervical lesions. It has been shown that follow up colposcopy and treatment of pre invasive lesions can be performed immediately which not only avoids recall but also increases compliance to diagnostic investigation and treatment. The test is not expensive and it is possible to train providers to detect aceto white lesions with the naked eye examination.

Colposcopy was performed on 40 cases (33 VIA positive and remaining women with an unhealthy looking cervix).

In VIA positive cases, 11 had CIN1, 1 had CIN2, 1 had CIN3 and 1 had invasive cancer. Only 1 case which was missed by VIA were detected by colposcopy.

Conclusion

VIA is a simple, inexpensive, attractive, low cost technology test in low resource settings. It is comparable to cytology in detecting low as well as high grade lesions in terms of sensitivity, specificity and positive predictive value.

The majority of women in India, who belongs to the low socio economic status, remain devoid of any screening test, as Pap smear is unaffordable to them. The time has come, to integrate VIA based screening programmes at the primary care level of health services, and to downstage cancer cervix in our country.

References

1. Vedantham H, Silver MI, Kalpana B, et al. Determinants of VIA (Visual Inspection of

the Cervix After Acetic Acid Application) positivity in cervical cancer screening of women in a peri-urban area in Andhra Pradesh, India. *Cancer Epidemiol Biomarkers Prev.* 2010;19(5):1373–1380.

2. Sreedevi A, Javed R, Dinesh A. Epidemiology of cervical cancer with special focus on India. *Int J Womens Health.* 2015;7:405–414.
3. Bamanikar SA, Baravkar DS, Chandanwale SS, Dapkekar P. Study of Cervical Pap Smears in a Tertiary Hospital. *Indian Medical Gazette.* 2014;250-254.
4. Petry KU, Womann B, Schneider A. Benefits and Risks of Cervical Cancer Screening. *Oncol Res Treat* 2014;37(suppl 3):48-57
5. Cervical cancer control in developing countries: Memorandum from a WHO meeting. *Bulletin World Health Organ* 1996;74:345-51.
6. American Cancer Society. *Global Cancer Facts & Figures 3rd Edition.* Atlanta: American Cancer Society; 2015.
7. Cervical Cancer: Statistics. *Cancer.Net* Editorial Board, 01/2019
8. Andrae B, Andersson TM, Lambert PC et al. Screening and cervical cancer cure: population based cohort study. *The British Medical Journal* 2012;344:e900.
9. Bindal J, Agrawal S. Visual inspection of cervix with acetic acid in early diagnosis of cin and early cervical cancer. *Int J Reprod Contracept Obstet Gynecol* 2017;6:3564-8.
10. Bobdey S, Sathwara J, Jain A, Balasubramaniam G. Burden of cervical cancer and role of screening in India. *Indian J Med Paediatr Oncol.* 2016;37(4):278–285.
11. Sherris J, Herdman C, Elias C. Cervical cancer in the developing world. *West J Med.* 2001;175(4):231–233.

12. Bosch FX, Munoz N. The viral etiology of cervical cancer. *Virus Research* 2002;89:183-90.
13. Catarino R, Petignat P, Dongui G, Vassilakos P. Cervical cancer screening in developing countries at a crossroad: Emerging technologies and policy choices. *World J Clin Oncol.* 2015;6(6):281–290.
14. Bhatla N, Mukhopadhyay A, Joshi S, Kumar A, Kriplani A, Pandey R M, Verma K. Visual inspection for cervical cancer screening; evaluation by doctor versus paramedical worker. *Indian J Cancer* 2004;41:32-6.
15. Sankaranarayanan R, Wesley R, Somanathan T, Dhakad N, Shyamalakumary B, Amma NS, Parkin DM, Nair MK. Visual inspection of the uterine cervix after the application of acetic acid in the detection of cervical carcinoma and its precursors. *Cancer.* 1998 Nov 15;83(10):2150-6.
16. Goel PK, Bharti BB, Pandey CM, et al. A tertiary care hospital-based study of conventional risk factors including lipid profile in proven coronary artery disease. *Indian Heart J* 2003;55:234–40.
17. Khan MJ, Castle PE, Lorincz AT, Wacholder S, Sherman M, Scott DR, Rush BB, Glass AG, Schiffman M. The elevated 10-year risk of cervical precancer and cancer in women with human papillomavirus (HPV) type 16 or 18 and the possible utility of type-specific HPV testing in clinical practice. *J Natl Cancer Inst.* 2005;97:1072–1079.
18. Khan S, Jha R, Pant P. Accuracy of cytology, visual inspection with acetic acid or lugol's iodine in cervical cancer screening. *Nepal Journal of Obstetrics and Gynaecology* 2007;2(2):48-53.
19. Cronje HS, Parham GP, Cooreman BF, de Beer A, Divall P, et al. A comparison of four screening methods for cervical neoplasia in a developing country. *Am J Obstet Gynecol* 2003;188: 395-400.