

COMPARISON OF THE EFFICACY OF THE VISUAL INSPECTION WITH ACETIC ACID AND PAP SMEAR AND COLPOSCOPY IN CERVICAL CANCER SCREENING

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ABSTRACT:

Cervical cancer is the second most cited reason for cancer death which is largely preventable. In developing countries, nearly 80% of the detection of cervical cancers occurs at advanced stage which demands a cost effective approach which is applicable for mass approach for effective cervical cancer screening programs. Various tools for screening and assessment have been developed which includes colposcopy, the Pap smear and VIA. Hence this study was designed to evaluate the efficacy between these screening methods in screening for cervical cancer. This prospective study 100 women of age group between 20-70 years of age group attending the gynecology department, Vinayaka Mission's Medical College, Karaikal from November 2019 to June 2021 for the duration of 18 months. Sexually active and non-pregnant woman with no active disease of cervix, no history of cervical conisation, cryo or other invasive cervical cancer treatment, patients with no history of pre invasive lesions, patients with no history of cervical cancer are included in study

INTRODUCTION:

Globally cervical cancer has been ranked as the 4th most common occurring cancer in women with an occurrence of 5,70,000 new cases in 2018 which constitutes 7.5% of all female cancer deaths. One fourth of the world's cervical cancer death is contributed by India alone with 60,078 deaths and 96,922 new cases in 2018^{5,6} Among Indian women, this is the second most cited reason for cancer death which is largely preventable.⁷ The Multifactorial reasons is linked to human papilloma viruses, multiple sexual partners, sexual intercourse, multiparty, long-term use of oral contraceptives, tobacco smoking, low economic status , Chlamydia trachomatis infection, deficiency in micro nutrients and diet deficient in vegetables and fruits. In developing countries, nearly 80% of the detection of cervical cancers occurs at advanced stage which demands a cost effective approach which is applicable for mass approach for effective cervical

cancer screening programs.^{12,13} Globally, Pap smear test has been the tool in cervical cancer prevention programs. In developing countries where even primary health needs are not adequate, VIA and the Pap smear is the main stream in screening. Screening helps in detecting precancerous lesions thereby preventing in development of invasive cervical cancer. Various tools for screening and assessment have been developed which includes colposcopy, the Pap smear and VIA. Hence this study was designed to evaluate the efficacy between these screening methods in screening for cervical cancer.

AIM AND OBJECTIVES:

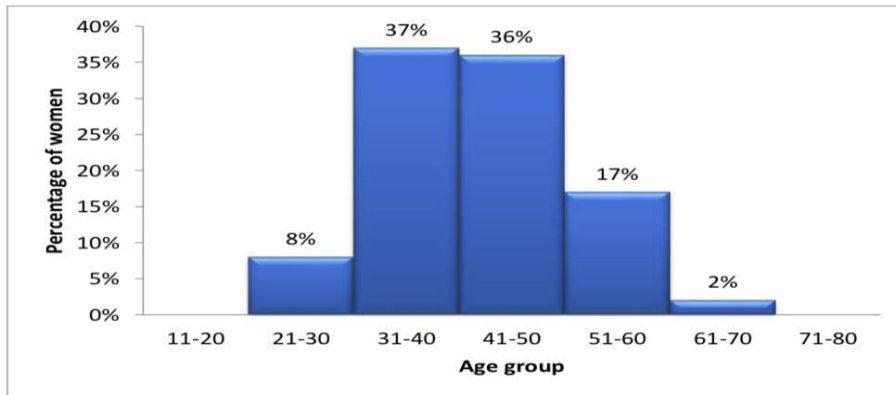
To compare the efficacious value of the visual inspection with acetic acid and Pap smear and colposcopy in screening for cervical cancer and to deduce the best method for screening among the three methods.

MATERIALS AND METHODS:

- In this prospective study 100 women of age group between 20-70 years of age group attending the gynecology department, Vinayaka Mission's Medical College, Karaikal from November 2019 to June 2021 for the duration of 18 months. Sexually active and non-pregnant woman with no active disease of cervix, no history of cervical conisation, cryo or other invasive cervical cancer treatment, patients with no history of pre invasive lesions, patients with no history of cervical cancer are included in study and patients who are diagnosed with cervical cancer. Patients whose Pap smear was not satisfactory were excluded from the study. After taking proper written and informed consent, patients will undergo a Pap test, Visual inspection in acetic acid and colposcopy, and all of the results will be recorded. By using descriptive indices, we will determine the sensitivity, specificity, positive and negative predictive value, and accuracy of each method, i.e., conventional Pap smear, Visual inspection in acetic acid and colposcopy. The results are that the sensitivity and specificity for colposcopy was found to be 90.48% and 95.65%. The sensitivity and specificity for Pap smear was found to be 76.19% and 26.09%. The sensitivity and specificity for visual inspection with acetic acid was found to be 71.43% and 78.26%. Among the three procedures colposcopy has been found to be more sensitive and specific compared to pap smear procedure and visual inspection with acetic acid procedure

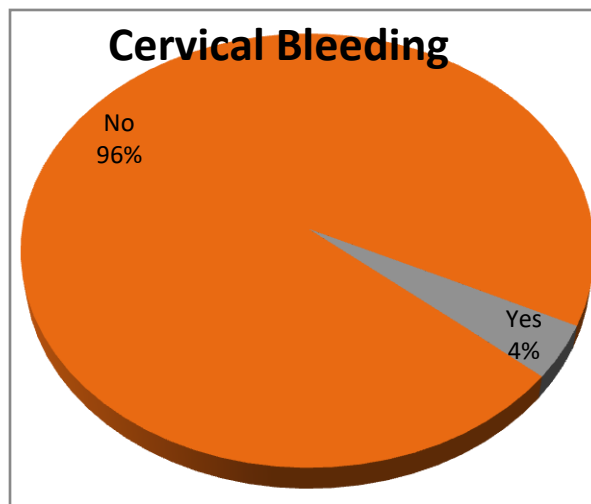
RESULTS:

FIGURE 1: Age distribution of participants



Among the participants most of them were in the age group between 31 years to 50 years which constitutes 73% of participants

FIGURE 2: HISTORY OF CERVICAL BLEEDING AMONG STUDY PARTICIPANTS



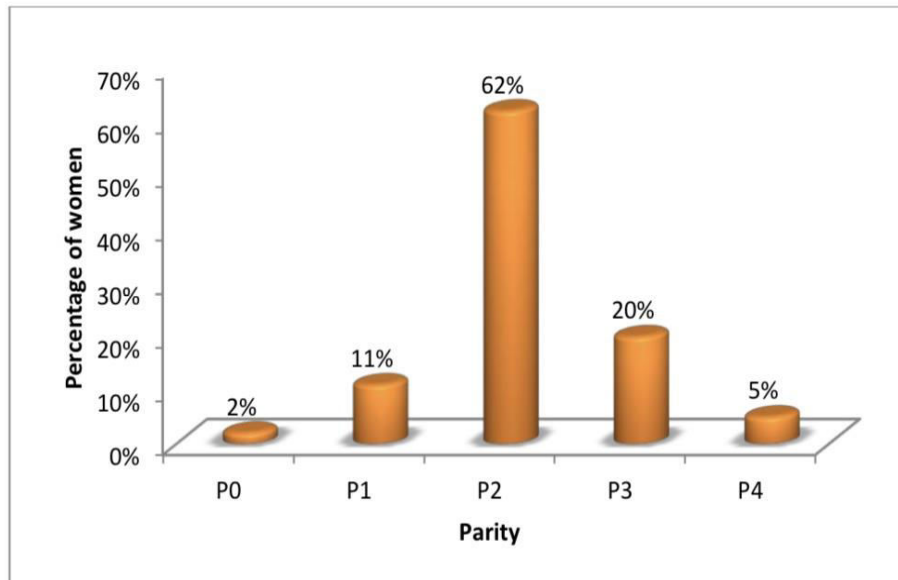


FIGURE 3:DISTRIBUTION OF PARITY AMONG STUDY PARTICIPANTS

Table 1: Visual inspection with acetic acid vs Biopsy of specimen among participants

		Biopsy		Total	Kappa statistics	p-value
		Abnormal	Normal			
VIA	Abnormal	15	5	20	0.498	0.001
	Normal	6	18	24		
	Total	21	23	44		

Among 20 abnormalities seen in VIA among participants, 15 showed abnormal biopsy while among 24 participants with normal VIA, 6 participants showed abnormal biopsy. P value was found to be significant (p=0.001)

Table 2: Pap smear vs Biopsy of specimen among participants

		Biopsy		Total	Kappa statistics	p-value
		Abnormal	Normal			
Pap smear	Abnormal	16	17	33	0.022	0.862
	Normal	5	6	11		
	Total	21	23	44		

Among 33 abnormalities seen in pap smear among participants, only 16 showed abnormal biopsy while among 11 participants with normal pap smear, only 5 participants showed abnormal biopsy. P value was not found to be significant ($p=0.862$)z

Table 3: Colposcopy vs Biopsy of specimen among participants

		Biopsy		Total	Kappa statistics	p-value
		Abnormal	Normal			
Colposcopy	Abnormal	19	1	20	0.863	<0.001
	Normal	2	22	24		
	Total	21	23	44		

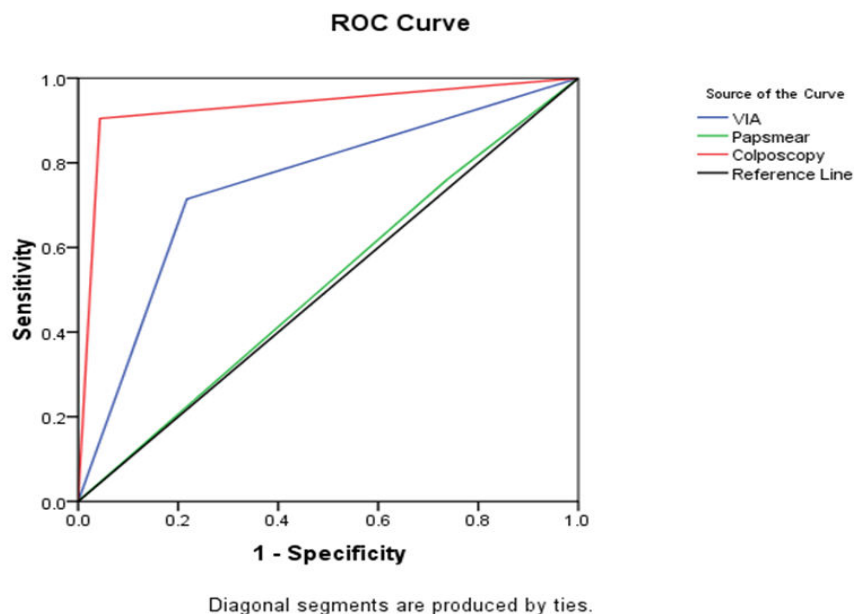
Among 20 abnormalities seen in colposcopy among participants, 19 showed abnormal biopsy while among 24 participants with normal colposcopy, only 2 participants showed abnormal biopsy. P value was found to be significant ($p<0.001$)

Table 4: Comparison between VIA vs Pap smear vs Colposcopy among participants

Statistic	VIA		Pap smear		Colposcopy	
	Value	95% CI	Value	95% CI	Value	95% CI
Sensitivity	71.43%	47.82% to 88.72%	76.19%	52.83% to 91.78%	90.48%	69.62% to 98.83%
Specificity	78.26%	56.30% to 92.54%	26.09%	10.23% to 48.41%	95.65%	78.05% to 99.89%
Positive Likelihood Ratio	3.29	1.45 to 7.47	1.03	0.73 to 1.45	20.81	3.04 to 142.22
Negative Likelihood Ratio	0.37	0.18 to 0.74	0.91	0.33 to 2.55	0.1	0.03 to 0.37
Positive Predictive Value	75.00%	56.89% to 87.21%	48.48%	40.10% to 56.96%	95.00%	73.55% to 99.24%
Negative Predictive Value	75.00%	59.60% to 85.92%	54.55%	30.02% to 77.05%	91.67%	74.59% to 97.63%
Accuracy	75.00%	59.66% to 86.81%	50.00%	34.56% to 65.44%	93.18%	81.34% to 98.57%

The sensitivity and specificity for colposcopy was found to be 90.48% and 95.65% . The sensitivity and specificity for Pap smear was found to be 76.19% and 26.09%. The sensitivity and specificity for visual inspection with acetic acid was found to be 71.43% and 78.26%. Among the three procedures colposcopy has been found be more sensitive and specific compared to pap smear procure and visual inspection with acetic acid procedure.

Figure5:ROCCurve



DISCUSSION:

In developing country like India, cervical cancer has been considered as the common aetiology for cancer death among women. On an average every year it is been estimated that around 96,922 were suffering from cervical cancer and around 60,078 have lost their lives fighting against it. Manju Talathi et al¹⁴, conducted a prospective observational study at Pune to compare the efficacy of the Pap smear, VIA and colposcopy for mass screening of precancerous and cancerous lesions of the cervix. They found that sensitivity of colposcopy was almost 100% as compared to Pap sensitivity of 90.2% which is similar to our study where sensitivity for colposcopy was higher at 90.48% compared to Pap sensitivity at 76.19%. But VIA sensitivity was lesser compared to Pap smear sensitivity which in our study was more similar, 71.43% for VIA vs 76.19% for Pap. They concluded that colposcopy as an accurate tool among the three screening methods, while VIA can still aid in screening pre malignant and malignant lesions of cervix. Even though in our study VIA sensitivity was similar to Pap sensitivity, the pap specificity was comparatively lower than specificity for VIA which proves the point that VIA in our study can also be considered as adjuvant to colposcopy in detecting and pre-cancerous conditions of the cervix. But they concluded that colposcopy as most sensitive and all VIA positive subjects should undergo colposcopy for better accuracy which is more appreciated in our study results with VIA along colposcopy achieving better results in diagnosis. Singh S et al, in their study involved 100 women with Pap smear and colposcopy and they found that colposcopy was more sensitive with 95% and Pap smear sensitivity with only 20% which is

similar to our study where colposcopy sensitivity was 90.48% and for Pap sensitivity was 76.19% but the specificity according to Singh study for Pap was higher than colposcopy at 91.25% whereas this our study specificity was comparatively higher for colposcopy than Pap smear, 95.65% vs 26.09%. Ashmita et al¹³, conducted their prospective observational study to assess and evaluate the outcome of Pap smear, colposcopy and histopathology to detect precancerous lesion of cervix showed that colposcopy had better sensitivity compared to Pap smear, 90.24% vs 19.5% which is similar to our study. Jyothi Gandavaram et al¹⁵, in their prospective study to assess the correlation of pap smear with colposcopy findings and biopsy to evaluate the cervical lesions in women found that Pap smear had sensitivity of 28% and specificity 99.32% when compared to colposcopy which was 80.2% and 82.14% respectively. Colposcopy has the highest accuracy with 84.65% compared to Pap smear with 78%. Which was similar to our study with accuracy for colposcopy and Pap being 93.18% and 50%. Colposcopy has the advantage in not repeating the follow up as compared with Pap smear which is again similar to our study making colposcopy as more accurate method in diagnosing. The sensitivity and specificity for colposcopy was 83.3% and 72.2% respectively while the sensitivity and specificity for Pap smear was 91.7% and 45.45% respectively according to Dipali et al study which is more similar to our study findings where sensitivity for Colposcopy and Pap was 90.48% and 76.19% respectively and a lower specificity for Pap when compared to colposcopy, 26.09% vs 95.65%. All the above mentioned study findings were in favor of colposcopy as most accurate diagnostic tool in diagnosing precancerous and cancerous lesions in cervix.

CONCLUSION:

Cervical cancer if identified and managed at a very early stage can be prevented and cured. But the basic problem in identifying these early cervical cancer lesions is that these early lesions are asymptomatic. Therefore, mandatory screening on regular basis is necessary for all females above the age group of 40 years. In developing country like India, Pap smear still widely used screening method deployed at low resource settings. Our study indicates that colposcopy as more refined and sensitive tool than Pap smear and VIA for screening. Hence our study suggests that the efficiency of detection of cervical abnormalities is more accurate with colposcopy and colposcopy directed biopsy. Colposcopy can still be applied to all VIA positive lesions so that even low grade lesions of cervix can be diagnosed and for higher lesions early management can be done.

REFERENCES:

1. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2018). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer.

2. Stelzle D, Tanaka LF, Lee KK, et al. Estimates of the global burden of cervical cancer associated with HIV. *Lancet Glob Health* 2020; published online Nov 16.
3. Parkin M. Personal communication, IARC; 2000.
4. PATH Program for Appropriate Technology in Health. Preventing Cervical cancer in low-resource settings. *Outlook*. 2000; 18(1): 1-8.
5. Ferlay J, Soerjomataram I, Dikshit R, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer*. 2015; 136(5): E359–386.
6. Bruni L, Albero G, Serrano B, et al. Human Papillomavirus and Related Diseases Report. *Information Centre on HPV and Cancer (HPV Information Centre)*; 2019.
7. Kadam Y, Dhobale R, Gore A, Tripathi N. Barriers for early detection of cancer amongst Indian rural women. *South Asian J Cancer*. 2014; 3(2): 122.
8. Bosch FX, Manos MM, Muñoz N, Sherman M, Jansen AM, Peto J, et al. Prevalence of human papillomavirus in cervical cancer: A worldwide perspective. International biological study on cervical cancer (IBSCC) study group. *J Natl Cancer Inst* 1995; 87: 796-802.
9. Walboomers JM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV, et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *J Pathol* 1999; 189: 12-9.
10. Ferenczy A, Franco E. Persistent human papillomavirus infection and cervical neoplasia. *Lancet Oncol* 2002; 3: 11-6.
11. Franco EL, Villa LL, Sobrinho JP, Prado JM, Rousseau MC, Désy M, et al. Epidemiology of acquisition and clearance of cervical human papillomavirus infection in women from a high-risk area for cervical cancer. *J Infect Dis* 1999; 180: 1415-23.
12. Bosch FX, Munoz N. The viral etiology of cervical cancer. *virus Res* 2002; 89: 183-90
13. Ashmita D, Shakuntala P.N, Rao SR et. al. Comparison and Correlation of PAP Smear, Colposcopy and Histopathology in Symptomatic Women and Suspicious Looking Cervix in a Tertiary Hospital Care Centre. *Int J Health Sci Res*. 2013; 3(5): 50-59.
14. Talathi et al. Comparison and correlation of visual inspection with acetic acid, papanicolaou smear and colposcopy in detection of precancerous cervical lesions. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2016; 3384-3389.

15. Gandavaram J, Reddy BP. Correlation of Pap smear and colposcopic findings in relation to histopathological findings among women attending a tertiary care hospital: a two year study. *Int J Reprod Contracept Obstet Gynecol.*2019;8:2163-8