Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 06, 2024

Efficiency Of Direct Inspection Of The Cervix With The Application Of 3% Acetic Acid (Via) In The Early Diagnosis Of Cervical Cancer In Females

Dr Pragati Meena,[1] Dr Gunjan Pandey,[2] Dr Meena Naik[3*]

[1]Associate professor, Department of Obstetrics and Gynecology, JNU medical College and hospital, JNUIMSRC Institute, Jaipur, Raj

[2]Pg 3 rd year resident, Department of Obstetrics and Gynecology, JNU medical College and hospital, JNUIMSRC Institute, Jaipur, Raj

[3]Professor and head of department, Department of Obstetrics and Gynecology, JNU medical College and hospital, JNUIMSRC Institute, Jaipur, Raj

***Corresponding Author –**
Dr Meena Naik
Email: drjitendraacharya@yahoo.in

ABSTRACT

Introduction: Cervical carcinoma stands as one of the foremost concerns within the spectrum of genital tract cancers. **Aim:** efficacy of direct inspection of the cervix with the application of 3% acetic acid in the early diagnosis of cervical cancer. **Methods:** The study conducted at the Department of Gynecology at Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur, from June 2022 to December 2023, focused on early detection of cervical cancer in women. **Result:** The study examined the results of the VIA test in relation to various demographic and reproductive factors among women aged 21 to 65. Notable findings include higher VIA positivity rates among younger age groups, with a decrease in positivity rates as age increases. Marital status appeared to influence VIA results, with higher positivity rates among widows compared to married women. There was a higher VIA positivity rate among women who reached menarche at a younger age and those married at a younger age. Irregular menstrual cycles and menopausal status were associated with a slightly higher VIA positivity rate. Parity seemed to influence VIA results, with higher positivity rates among women with more children. **Conclusion:** it was determined that the outcomes from the VIA were comparable to those from the pap smear.

Keywords: Cervical carcinoma, VIA, early diagnosis.

INTRODUCTION

Current projections suggest cervical cancer is the fourth most common cancer among women worldwide. India had highest mortality rate in 2015, with 16 deaths per 100,000 inhabitants when age was considered .Cervical carcinoma stands as one of the foremost concerns within the spectrum of genital tract cancers[1]. Central to its detection and prevention is the Pap smear, a screening tool designed to identify cervical intraepithelial neoplasia (CIN) and cervical cancer. Despite its established accuracy, recent scrutiny has prompted a closer

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 06, 2024

examination of its efficacy, even though it boasts detection rates ranging from 80 to 95 percent for precancerous lesions. When coupled with colposcopy screening, the efficacy of detecting cervical carcinoma surges. Colposcopy, alongside cervical biopsy, emerges as a crucial diagnostic tandem, guiding the identification of women necessitating treatment for squamous intraepithelial lesions. In essence, women with compromised cervical health should undergo colposcopy, potentially followed by a guided biopsy, to ascertain their condition accurately[2]. The focus of ongoing studies lies in contrasting the effectiveness of the Pap smear and colposcopy as screening modalities for diagnosing both preinvasive and invasive cervical lesions[3].Various risk factors, including smoking, multiple sexual partners, and early marriage, compound the likelihood of developing cervical cancer, particularly in those with a personal or family history of the disease. However, the implementation of regular screening programs has notably mitigated the incidence of cervical carcinomas. This decline can be largely attributed to the identification and management of early precursors, known as cervical intraepithelial neoplasms (CINs), underscoring the pivotal role of proactive screening and intervention in averting the progression of cervical cancer[4].A PAP smear is a technique that be used to detect dysplasia by examining cells . Visual examination of the cervix using acetic acid (VIA) is a screening method that includes the application of a solution containing 3 to 5 % of acetic acid on the cervix and then looking for distinct or well-defined aceto-white areas[5]. During the VILI test or Schiller's light zones are identified by visually examining the cervix with Lugol's iodine to detect preinvasive lesions. Both the VIA and the VILI are simple processes. Colposcopy procedure helps in the identification of sqamo- columnar and transformation zone. Subsequently, 2-3% acetic acid is applied to examine the characteristics of the lesion, which is then categorized according to the guidelines of the International Federation for Cervical Pathology and Colposcopy (IFCPC)[6]. Treating lesions and conducting targeted biopsies in problematic areas are two options that pursued while preserving fertility.

Aim

To determine whether or if there is a correlation between the findings of the VIA and certain demographic characteristics among women.

Methodology

The study was conducted at the Department of Gynecology at Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur, spanning from June 2022 to December 2023. The target population comprised women aged 21 to 65 who sought medical care at the aforementioned institute. A sample size of three hundred female volunteers was enlisted for the investigation. Inclusion criteria encompassed women within the reproductive age group of 21-65 years, those presenting with abnormal vaginal bleeding, individuals with a familial history of genital cancer, and those who provided informed consent. Exclusion criteria involved unmarried women, individuals below 21 years or above 65 years of age, those who had undergone complete hysterectomy, and individuals already diagnosed with cervical cancer.The research variables primarily focused on the early detection of cervical cancer in women. Attribute variables explored in the study included demographic factors

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 06, 2024

such as age, education, occupation, family income, religion, and marital status. Additionally, reproductive variables like age at menarche and marriage, coitus frequency, menstrual history, parity, clinical symptoms, and medical history were scrutinized. Factors such as multiple sexual partners, results and interpretations of Pap smear and VIA tests, and other observations during VIA were also considered.

RESULT

Table-1 Distribution of Frequency And Percentage of Women With VIA Findings

Demographic Variables		VIA				Total	
		Negative		Positive			
		Frequency	%	Frequency	%		
Age in years							%
	21-30	60	20	5	1.6	65	21.7
	31-40	118	39.3	14	4.6	132	44.0
	41-50	72	24	11	3.6	83	27.7
	51-60	13	4.3	3	1	16	5.3
	61-65	4	1.3	0	0	4	1.3
Education	Illiterate	99	33	10	3.3	109	36.3
	primary education	60	20	8	2.6	68	22.7

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	Secondary education	95	31.6	12	4	107	35.7
	Graduate	13	4.3	3	1	16	5.3

In our study, women aged 21-30, 20% tested negative, and 1.6% tested positive for VIA. In the 31-40 age group, 39.3% tested negative, and 4.6% tested positive. Among women aged 41-50, 24% tested negative, and 3.6% tested positive. For those aged 51-60, 1% tested positive, with no positives in the 61-65 age group.Regarding education, among illiterate women, 33% tested negative, and 3.3% tested positive for VIA. For those with elementary education, 20% tested negative, and 2.6% tested positive. Women with upper secondary education showed 88.8% negative and 11.2% positive results. Lastly, among those with completed education, 81.3% tested negative, and 18.8% tested positive for the VIA test.

Table-2 Distribution of Frequency and Percentage of Women With VIA Findings

Occupation	Home Maker	147	49	16	5.3	163	54.3
	Business	18	6	0	6	18	6.0
	private	11	3.6	4	1.3	15	5.0
	Government	7	2.3	1	0.3	8	2.7
	Agriculture/cooly	84	28	12	4	96	32.0
Marital status	Married	258	86	28	9.3	286	95.3
	Widow	9	3	5	1.6	14	9
	Total	267	88.9	33	10.9	300	100

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In all, 163 women are homemakers, 147 (49%) of whom had a negative VIA test, and 16 (5.3%) of whom had a positive test. There is not a single person who has a positive VIA test despite the fact that 18 women are engaged in business. There are 15 women who are employed in the private sector, 11 of whom have a negative VIA test and 4 of whom have a positive test. There are eight women who are employed by the government, seven of whom have a negative VIA test and one of whom has a positive result. With regard to the VIA test, 96 women are employed in the agricultural sector, 84 (28%) of whom were negative and 12 (4%), who were positive.286 of the women were married. There were 258 (86%) negative results for the VIA test, and 28 (9.3%) positive results. 14 of the women were widows. 5 (1.6% of the total) were positive for the VIA test, whereas 9 (3%) were negative.

Table-3 Distribution of frequency and percentage of women reproductive history with VIA findings

Age at marriage	<19 years	168	56	21	7	189	63
	20-29 years	96	32	11	3.6	107	35.7
	>30 years	3	1	1	0.3	4	1.3
Coitus frequency	monthly once	61	20.3	6	2	67	22.3
	Monthly Twice	84	28	10	3.3	94	31.3
	Monthly 3-5 Times	82	27.3	10	3.3	92	30.7
	> 5 times	40	13.3	7	2.3	47	15.7

In our study, women married at age 19 or younger (189 total), 56% tested negative and 7% tested positive for VIA. For those married between ages 20 and 29 (107 total), 32% tested negative and 3.6% tested positive. Women marrying at age 30 or older (4 total) had 1% negative and 0.3% positive VIA results. For those having coitus twice a month (94 total),

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89% tested negative and 11% tested positive. Women having coitus between three to five times monthly (92 total) showed 89% negative and 11% positive results. Lastly, for those having coitus more than five times monthly (47 total), 85% tested negative and 15% tested positive for VIA.

Table 4:Distribution of frequency and percentage of women reproductive history with VIA findings

Menstrual history	Regular cycle	139	46.3	13	4.3	152	50.7
	Irregular cycle	94	31.3	12	4	106	35.3
	Menopause	34	11.3	8	2.6	42	14
Parity	Nulliparous	5	1.6	1	0.3	6	2
	1-2 Children	147	49	7	2.3	154	51.3
	3-4 children	102	34	18	6	120	40
	>5 children	13	4.3	7	2.3	20	6.7
	Total	267	88.9	33	10.9	300	100

As for the VIA test, there were 152 women who had normal menstrual cycles, 139 of whom were negative (46.3%), and 13 of whom were positive (4.3%). Among the 106 women who had an irregular menstrual cycle, 94 (31.3%) were negative for the VIA test, whereas 12 (4%) were positive for the test.There were 42 women who experienced menopause, 34 of whom had a negative result, and 8 of them had a positive result for the VIA testThere are six women who belong to the nullipara group, five of whom were negative (1.6%), and one of whom was positive (0.3%) for the VIA test. Out of the 154 women who had between one and two children, 147 (49%) were negative for the VIA test, and seven (2.3%) were positive. There are 120 women who had three to four children, 102 of whom got a negative result (34%) and

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18 of whom got a good result (6%). Women who have at least five children have a negative VIA test result of 20,13 (4.3%), whereas seven (2.3%) have a positive result.

Table-5 Diagnostic efficacy of VIA vs Pap Smear (golden standard) N = 300

VIA	**PAP SMEAR**	
	+	-
+	19	14
-	15	252
GRAND TOTAL	34	266
Sensitivity	$\frac{A}{a+c}$	= 55.88 %
Specificity	$\frac{D}{b+d}$	= 94.74 %
Positive Likelihood Ratio	$\frac{\text{Sensitivity}}{100 - \text{Specificity}}$	= 10.62
Negative Likelihood Ratio	$\frac{100 - \text{Sensitivity}}{\text{Specificity}}$	**= 0.47**

False Negative Rate (FNR) = c/a+c = 15/34 = 44.1% as a percentage The False Positive Rate (FPR) is as follows: b/b+d = 14/266 = 5.26% As a gold standard test, the table demonstrated that the effectiveness of the VIA was superior than that of the pap smear. Using the VIA, the sensitivity was found to be 54.88%, the specificity was found to be 94.74%, the positive likelihood ratio was 10.62, the negative likelihood ratio was 0.47, the false negative rate was 44.10%, and the false positive rate was 5.26%.The prevalence rate of the condition was 11.33 percent.

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Table-6 Association of women marital status with VIA findings N = 300

sno	MaritaStatus	VIA		Total	Value	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
		NEG	POS					
1	Married	258	28	286	9.162a	.002	.012	.012
2	Widow	9	5	14				

Pearson Chi-Square Continuity Correction Fisher's Exact Test=300

According to the table, the chi-square value stands at 9.162, which is lower than the table value at a significance level of $p< 0.05$. As a result, a statistically significant association was discovered between the marital status and the result of the VIA test.

Table-7 Association of women age at marriage with VIA findings N = 300

S.no	Age at Marriage	VIA		Total	Value	Asymp. Sig. (2-sided)
		NEG	POS			
1	< 19 years	168	21	189	.860a	.651
2	20-29 years	96	11	107		
3	> 30 years	3	1	4		

In the table, it was found that the chi-square value was 0.86, which is higher than the table value at a significance level of $p<0.05$. Therefore, there is no significant association between the age of the woman when she got married and the result of the VIA test.

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Table-8 Association of women family history of cervical cancer with VIA findings N = 300

sno	Family history of Cervical cancer	VIA		Total	Value	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
		NEG	POS					
1	Yes	1	2	3	9.592a	.002	.033	.033
2	No	266	31	297				
Total		267	33	300				

The table showed that the chi-square value was 9.592, and the asymp.sig value was 0.002, which is lower than the value of the table, which was found to be more than 0.05.
As a consequence, there is a precisely significant link between the VIA test result and the family history of cervical cancer associated with women.The presence of a family history of cervical cancer was shown to be a significant factor in the development of premalignant alterations in cervical cancer among women, as demonstrated by statistical evidence

DISCUSSION

Various studies have evaluated the efficacy of Visual Inspection with Acetic Acid (VIA) as a screening method for detecting cervical abnormalities, providing insights into its sensitivity and specificity[7]. Gaffin's research indicated VIA sensitivity ranges between 66% to 96%, with specificity ranging from 64% to 98%. Chammang Hami reported a sensitivity of 74.3% and specificity of 94%. Alliance observed a sensitivity of 70.4% and specificity of 77.6%. Nairobi[13] documented a sensitivity of 73.3% and specificity of 80%. Sankara Narayan[14] et al. reported a sensitivity of 70.8% and high specificity at 95%.

These studies collectively suggest that VIA shows moderate to high sensitivity in detecting cervical abnormalities, making it a potentially valuable screening tool, especially in settings with limited access to more advanced diagnostic technologies. However, the specificity varies across studies, indicating the need for careful consideration of VIA's results in clinical decision-making. Continued research and comparative studies could further refine the understanding and implementation of VIA in cervical cancer screening programs worldwide.
In the present study on Visual Inspection with Acetic Acid (VIA) as a screening method for cervical abnormalities, 300 participants were evaluated. The findings reveal that 33 participants tested positive for VIA, constituting 11% of the study population. In contrast, 267 participants tested negative, accounting for 89%.

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Comparatively, another study showed 24 participants testing positive for VIA, which is 12% of their study population, while 176 participants tested negative, representing 88%.
These results highlight the distribution of VIA outcomes in both studies, indicating a similar pattern of positive and negative results despite slight numerical variations between the two research efforts.

The present study compared the efficacy of Visual Inspection with Acetic Acid (VIA) and Pap smear tests in detecting cervical abnormalities, juxtaposed against findings from another study. In terms of sensitivity, the current research reported a VIA sensitivity of 55.88%, while the Pap smear sensitivity was 50.1%. In contrast, the other study documented a higher VIA sensitivity of 90%. For specificity, the present study observed a VIA specificity of 94.74% and a Pap smear specificity of 93.1%, whereas the other study reported a lower VIA specificity at 37%.

Regarding positive predictive value (PPV), the present study found VIA to have a PPV of 57.58%, whereas the other study reported a higher VIA PPV of 89.3%. Conversely, for negative predictive value (NPV), the current research showed VIA with an NPV of 94.38%, while the other study had a higher VIA NPV of 81%.

These comparative findings underscore variability in VIA's diagnostic performance across different studies, highlighting its potential as a sensitive but context-dependent screening tool for cervical abnormalities when compared to Pap smear tests.

Conclusion

Based on the study's findings, it is evident that certain demographic and attribute factors hold significance in relation to pap smear results, particularly marital status and family history of cervical cancer. However, when considering the VIA results, no statistically significant correlation was observed with the selected demographic and attribute factors among women. Despite the study highlighting the importance of factors such as age, education level, occupation, family income, religion, age at menarche, age at marriage, sexual activity frequency, menstrual history, parity, clinical symptoms, and medical history, none of these variables showed a significant association with VIA findings. Therefore, while demographic and attribute factors may influence pap smear outcomes, they do not appear to have a substantial impact on VIA results in this study.

At the conclusion of the study, it was determined that the outcomes from the VIA were comparable to those from the pap smear. To enhance cervical cytology in areas with few resources, it should be incorporated into our country's screening program.

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REFERENCE

1. Kaur S, kaur B, A descriptive study to assess the awareness of women regarding cervical cancer. Int. j. nsg.education. 2012, jan-june; 4(1): 66-2.
2. World cancer research fund international,www,wcrf.org/int/cancer-fact- figures/world wide –data
3. Ferlay J, Soerjomataram I, Ervik M. GLOBOCZ, V1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase : International Agency for Research on Cancer, 2013.
4. Bruni L, Barrionuevo-Rosas L, Serrano B, Brotons M, Cosano R, Muñoz J, et al; ICO Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in India; 2014 Apr -12.
5. Malek Ardahan; Recent Advances In Cervical Cancer .Department of Public Health Nrsing; Ege University-Turkey;2014,march-26
6. Who "Comprehensive Cervical Cancer Control ;December 2014.
7. Talwar.k Guideline For Cervical Screening Prograpressm, National Cancer Control Programme Be Aware ,Fight Cancer 18th -19th November 2006,government of India – world health organization collaborative programme.
8. Mugenda & Mugenda. (2003). Research methods quantitative & qualitative approaches. Nairobi: Acts Press
9. Padambhan H, Oumachigui A, Sankaran V, Rajaram P. A study of 80 cases of cervical intraepithelial neoplasia in a developing country. J Obs Gyn India. 1990;1:107-14.