Original Article

Early Cervical Cancer Screening

Visual Inspection of Cervix with Acetic Acid: A Good Alternative to Pap Smear for Cervical Cancer Screening in Resource Limited Setting

Sharmeen Aslam, Ayesha Nazir and Maryam Ali Shaheen

ABSTRACT

Objective: Determine the diagnostic accuracy of visual inspection of cervix (VIA) by using 3% acetic acid as a screening test for early and timely detection of cervical cancer when histopathology taken as the gold standard of diagnosis.

Study Design: Cross Sectional study.

Place and Duration of Study: This study was conducted at the Department of Gynaecology and Obstetrics, Allied Hospital, Faisalabad from February 2016 to February 2017.

Materials and Methods: All statistical data was entered and analyzed by using SPSS version 23. Frequencies and percentages were calculated and presented for qualitative variables like marital status. Parity, ethnic group and religion. Mean ± Standard Deviation (SD) was calculated for numerical variables like duration of marriage and age. The diagnostic accuracy, sensitivity specificity and positive predictive value (PPV) and negative predictive value (NPV) was calculated using two into two contingency table and histopathology was taken as the gold standard.

Results: Overall, 100% (n=320) female patients were included, in this study. There were 87.2% (n=279) patients had poor socio-economic status, while 12.8% (n=41) had good socio-economic status. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of VIA and abnormal looking cervix were 81.7%, 80.7%, 51.5%, 48.5% and 81.3% respectively.

Conclusion: Screening schedules are not planned and followed in Pakistan ever, so VIA is effective and always a useful diagnostic test for cervical cancer, pre-cancerous lesions can be detected at their early stage through VIA and mortality and morbidity can be reduced.

Key Words: Cervical Cancer, Visual inspection, Pap smear, Diagnosis.

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INTRODUCTION

In developing countries incidence of cervical cancer is more common among women[1, 2]. Every year more than 490,000 cases of cervical cancer appear all over the world in developing countries[3]. There are many diagnostic tests to diagnose the disease at early stage to start early treatment to decrease the mortality rate[3]. Disease control rate is increased through screening process; out of many diagnostic tests PAP smear test is one of the effective screening method to diagnose Cervical Cancer[4].

One of the limitation of this test is, it is not easily available in under developed countries like Pakistan due to lack of Economical Resources[5].

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Many other low cost diagnostic techniques are likely been used to investigate such problems in low income countries like Visual Inspection of Cervix after applying Acetic Acid (VIA), Visual inspection after lugol's iodine (VILI)[6]. Visual Inspection of Cervix after applying Acetic Acid is an effective method of differentiating healthy Cervix from non-healthy of diseased Cervix[7].

According to WHO Visual inspection after applying Acetic Acid Test technique can be used as a substitute of PAP smear cytology for identifying the cervical cancer patients[6]. Visual Inspection of Cervix after applying Acetic Acid (VIA) test is a non-invasive test which gives immediate reporting. Due to this specificity this test can be easily perform to diagnose Cervical Cancer in developing Countries like Pakistan[5].

Diagnostic Results through PAP smear and VIA has almost same diagnostic results but still it is under process that which screening test should be use as primary screening method to diagnose Cervical Cancer[9]. Other than cervical cancer dysplasia is also an abnormal appearance of cervix but it is not cancer, it can also be diagnosed with Pap smear test. Dysplasia may be precancerous presentation of cervix. Another common pre-cancerous presentation is cervical

intraepithelial neoplasia and can be diagnosed by biopsy test of cervix. Treatment of these two presentations (SIL and CIN) is usual and can stop the development of cancer. Aim of this study is to find out the cost effective diagnostic test which can be use as primary screening test to diagnose Cervical Cancer.

MATERIALS AND METHODS

This study was conducted at Allied Hospital, Faislabad, and the study design choose for conducting this study was Cross Sectional study method. Study was completed in one year duration from February 2016 to February 2017. Females of reproductive age 18-60 years were studied after taking informed consent from study population. Medical history was taken in detailed way and then Physical examination session was also arranged to assess the Cervix by trained staff. Separate room was arranged for maintaining privacy standards of the study personnel's. Procedure was explained to the personnel's to reduce their anxiety level. Sample size was calculated openepi.com by using CI 95%, power of study 80% and diagnostic accuracy 95.6%.

Patients were positioned in Lithotomy position for Physical Examination of Cervix. Proper light stand was arranged in the examination room to make the inspection area visible. Acetic Acid swab was applied to the Cervix and then cervix area was observed for Acetowhite changes. Changes were noticed in duration of 1 minute. In Diagnostic labeling Acetowhite changes were considered as Positive Test and dull or no changes were considered as negative test for diagnosing Cervical Cancer.

Tissue Biopsy was taken from the positive diagnostic results personnel's and the samples were sent to histopathology lab for further investigation. To analyze the frequencies and percentages all the data was analyzed in SPSS-17. Categorical variables were formed on the basis of Age, Marital Status, religion and ethnic group. Sensitivity and the specificity of the diagnostic test were calculated according to positive predictive value and negative predictive value.

All statistical data was entered and analyzed by using SPSS version 23. Frequencies and percentages were calculated and presented for qualitative variables like marital status. Parity, ethnic group and religion. Mean ± Standard Deviation (SD) was calculated for numerical variables like duration of marriage and age. The diagnostic accuracy, sensitivity specificity and positive predictive value (PPV) and negative predictive value (NPV) was calculated using two into two contingency table and histopathology was taken as the gold standard.

RESULTS

Overall, 100% (n=320) female patients were included, in this study. There were 87.2% (n=279) patients had poor socio-economic status, while 12.8% (n=41) had good socio-economic status. Nulliparous women were 8.8% (n=28), 47.1% (n=151) were single or multiparous, while 44.1% (n=141) were grand multipara. The mean age of the patients was 33.14±7.15 years. There were 36.9% (n=118) patients between 18-30 years, while majority of the patients i.e. 63.1% (n=202) between 31-50 years of age. (Table. 1).

The mean duration of sexual activity, menarche, age at first coitus, age at first pregnancy and parity of the patients was 12.04±5.81 years, 11.1±0.65 years, 17.16±2.44 years, 18.90±1.66 years and 5.03±1.15 respectively. Vaginal discharge was observed in 54.7% (n=175) patients. While lower abdominal pain was noted in 40.6% (n=130) patients. (Table. 2).

Table No. 1: Demographic Variables

Characteristics	Frequency	Percentage (%)
Socio-economic Status		
Poor	279	87.2
Good	41	12.8
Total	320	100.0
Woman type		
Nulliparous	28	8.8
Single or multiparous	151	47.1
Grand multipara	141	44.1
Total	320	100.0
Stratified Age		
18-30 Years	118	36.9
31-50 Years	202	63.1
Total	320	100.0
Descriptive Statistics (Mean±S.D)		
Age	33.14±7.15 years	

Table No. 2: Frequencies of Study Variables

Characteristics	Frequency	Percentage (%)
Vaginal Discharge		
Yes	175	54.7
No	145	45.3
Total	320	100.0
Lower Abdominal Pain		
Yes	130	40.6
No	190	59.4
Total	320	100.0
Descriptive Statistics (Mean±S.D)		
Duration of Sexual Activity	12.04±5.81 years	
Menarche	11.1±0.65 years	
Age at first coitus	17.16±2.44 years	
Age at first pregnancy	18.90±1.66 years	
Parity	5.03±1.15	

Among VIA positive patients in which cervixes looking abnormal 134 (51.5%) have positive histopathologic finding and 126 (48.5%) have negative histopathology, similarly among VIA negative and abnormal looking

patients 30 (50%) patients have positive and 30 (50%) have negative histopathology (Table-3).

The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of VIA and abnormal looking cervix were 81.7%, 80.7%, 51.5%, 48.5% and 81.3% respectively (Table. 4).

Table No. 3: Validity of screening test for early diagnosis of cervical cancer

VIA*	Histopathology findings		
	Positive	Negative	Total
VIA Positive and Abnormal looking cervix	134 (51.5%)	126 (48.5%)	260
VIA Negative but abnormal looking cervix	30 (50%)	30 (50%)	60
Total	164	156	320

*VIA: Visual inspection of the cervix after acetic acid application

Table No. 4: Diagnostic Accuracy of VIA

Diagnostic Measures	Value
Sensitivity	81.7%
Specificity	80.7%
Positive Predictive Value (PPV)	51.5%
Negative Predictive Value (PPV)	48.5%
Accuracy	81.3%

DISCUSSION

Cervical Cancer is considered as one of the emerging health problem among females of reproductive age[10]. Every year thousands of cases appear. Its incidence is higher in the developing countries like Pakistan[10]. In Pakistan its incidence is about 3.6% in every year. The most dangerous thing is, people have less awareness about cervical cancer, due to lack of awareness about disease sign and symptoms patients come late to the hospitals specially they approach hospitals at last stages[11].

Different diagnostic tests are performed to diagnose Cervical Cancers. The Diagnostic Test PAP Smear is the most common test in developed countries and can be use as primary diagnostic test for Cervical Cancer Screening in developed Countries, but in under developed countries due to lack of resources this test cannot be use commonly, so this test is not approachable in rural areas and under developed places[12]. While Visual Inspection of Cervix after applying Acetic Acid (VIA) Test is use as a substitute of PAP smear in developing countries[13,14].

In our study VIA was positive in 81.2% patients and among VIA positive patients in which cervixes looking abnormal 134 (51.5%) have positive histopathologic finding and 126 (48.5%) have negative histopathology, similarly among VIA negative and abnormal looking patients 30 (50%) patients have positive and 30 (50%) have negative histopathology. In some previous studies VIA positive was reported in 1.7 to 29% patients[15,16,17].

VIA is a non-invasive test which provide quick results or it is less costly test. So it is a very useful test in developing countries to diagnose Cervical Cancer. This test can easily be performed in rural areas where hospitals do not have so many diagnostic resources. Due to its non-invasive approach this test can be perform easily without creating anxiety to patient. Reporting of this test is quick and based on visual assessment; this property encourages quick diagnosis of Cervical Cancer.

According to one study 3.1 % females were diagnosed positive for Cervical Cancer through VIA testing on Acetowhite appearance of Cervix[18]. Another study was conducted, which showed that 28% females diagnosed as positive for Cervical Cancer over Acetowhite grading through VIA[19].

In our study sensitivity, specificity, positive predictive value, negative predictive value and accuracy of VIA and abnormal looking cervix were 81.7%, 80.7%, 51.5%, 48.5% and 81.3% respectively. In some previous studies sensitivity of VIA noted from 60% to 100% and specificity ranged from 36.4% to 99.1%[20,21].

CONCLUSION

Screening schedules are not planned and followed in Pakistan ever, so VIA is effective and always a useful diagnostic test for cervical cancer, pre-cancerous lesions can be detected at their early stage through VIA and mortality and morbidity can be reduced.

Author's Contribution:

Concept & Design of Study:	Sharmeen Aslam
Drafting:	Ayesha Nazir & Maryam Ali Shaheen
Data Analysis:	Ayesha Nazir & Maryam Ali Shaheen
Revisiting Critically:	Sharmeen Aslam & Ayesha Nazir
Final Approval of version:	Sharmeen Aslam

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REFERENCES

1. Blumenthal PD, Gaffikin L, Deganus S, Lewis R, Emerson M, Adadevoh S. Cervical cancer prevention: safety, acceptability, and feasibility of a single-visit approach in Accra, Ghana. Am J Obstet Gynecol 2007;196:407.e1-e9.
2. Jeronimo J, Morales O, Horna J, Pariona J, Manrique J, RubiñosJ, et al. Visual inspection with acetic acid for cervical cancer screening outside of

low-resource settings. Revista Panamericana de salud Pública 2005;17:1-5.
3. Basil JB, Horowitz IR. Cervical carcinoma: contemporare management. Obstet Gynecol Clin North Am 2001;28:727-42.
4. De Vuyst H, Claeys P, Njiru S, Muchiri L, Steyaert S, De Sutter P, et al. Comparison of pap smear, visual inspection with acetic acid, human papillomavirus DNA-PCR testing and cervicography. Int J Gynecol Obstet 2005;89: 120-6.
5. Tayyeb R, Khawaja N, Malik N. Comparison of visual inspection of cervix and Pap smear for cervical cancer screening. J Coll Physicians Surg Pak 2003;13:201-3.
6. Bhatla N, Mukhopadhyay A, Joshi S, Kumar A, Kriplani A, Pandey R, et al. Visual inspection for cervical cancer screening; evaluation by doctor versus paramedical worker. Ind J Cancer 2004; 41:32-6.
7. Soutter W, Dina R. Premalignant disease of the genital tract. Gynaecology London: Churchill Livingstone; 2003.p.569-71.
8. Doh A, Nkele N, Achu P, Essimbi F, Essame O, Nkegoum B. Visual inspection with acetic acid and cytology as screening methods for cervical lesionsin Cameroon. Int J Gynecol Obstet 2005; 89:167-73.
9. Goel A, Gandhi G, Batra S, Bhambhani S, Zutshi V, Sachdeva P. Visual inspection of the cervix with acetic acid for cervical intraepithelial lesions. Int J Gynecol Obstet 2005;88:25-30.
10. Munoz N, Bosch FX, de Sanjose S, Herrero R, Castellsagué X, Shah KV, et al. Epidemiologic classification of human papillomavirus types associated with cervical cancer. N Engl J Med. 2003;348:518-27.
11. Abbasi AN, Zahid S, Bhurgri Y, Ali N, Karsan F. Nasopharyngeal Carcinoma-An Update of Treatment and Acute Radiation Induced Reactions from a Tertiary-Care Hospital in Pakistan. Asian Pac J Cancer Prev 2011;12:735-8.
12. Bhatla N, Mukhopadhyay A, Kriplani A, Pandey R, Gravitt PE, Shah K, et al. Evaluation of adjunctive testsfor cervical cancerscreening in low resource settings. Ind J Cancer 2007;44:51.
13. Cronje H. Screening for cervical cancer in the developing world. Best Pract Res Clin Obstet Gynaecol 2005;19:517-29.
14. Szarewski A. Cervical screening by visual inspection with acetic acid. Lancet 2007;370: 365-6.
15. Albert S, Oguntayo O, Samaila M. Comparative study of visual inspection of the cervix using acetic acid (VIA) and Papanicolaou (Pap) smearsfor cervical cancerscreening. E Cancer Med Sci 2012; 6:262.
16. Bomfim S, Santana-Franco E, Bahamondes L. Visual inspection with acetic acid for cervical cancer detection. Int J Gynecol Obstet 2005;88: 65-6.
17. Sankaranarayanan R, Wesley R, Somanathan T, Dhakad N, Shyamalakumary B, Amma NS, et al. Visual inspection of theuterine cervix after the application of acetic acid in the detection of cervical carcinoma and its precursors. Cancer 1998;83:2150-6.
18. Megevand E, Denny L, Dehaeck K, Soeters R, Bloch B. Acetic acid visualization of the cervix: an alternative to cytologic screening. Obstet Gynecol 1996;88:383-6.
19. Belinson J, Pretorius R, Zhang W, Wu L, Qiao Y, Elson P. Cervical cancer screening by simple visual inspection after acetic acid. Obstet Gynecol 2001;98:441-4.
20. Rana T, Zia A, Sher S, Tariq S, Asghar F. Comparative Evaluation of PAP Smear and Visual Inspection of Acetic Acid (VIA) in CervicalCancer Screening Program in Lady Willingdon Hospital, Lahore. Ann King Edward Med Univ. 2010;16: S104-7.
21. Mahmud G, Tasnim N, Iqbal S. Comparison of Visual Inspection with acetic acid and Pap smear in cervical cancer screening at a tertiary care hospital. J Pak Med Assoc 2013;63:1013-6.