Original Article

Cervical Cancer Screening

Comparative Study of Visual Inspection of Cervix Through Acetic acid (VIA) and Papanicolaou (Pap) Smears for Cervical Cancer Screening

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ABSTRACT

Objective: To compare the accuracy of visual inspection of cervix through acetic acid with Pap smear using colposcopic guided biopsy as gold standard.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Obstet & Gynae, Fauji Foundation Hospital, Rawalpindi from May 2013 to December 2014.

Materials and Methods: Total of 145 patients were included in the study. Demographic characteristics and VIA findings as positive, negative or unsure were recorded on a proforma. VIA positive and patients with unsure findings were asked to follow up in colposcopy clinic on a later date for colposcopic guided biopsy. Colposcopic directed biopsy was taken as the gold standard to assess visual inspection findings. SPSS version 17 was used for statistical analysis.

Results: A total of 130 patients were finally recruited for our study.VIA was positive in 11%, negative in 77%, and unsure in 11%.Pap smear report was normal in 117 (90%) patients and abnormal in 13(10%) patients. Pap smear abnormality was CIN 1in 11, CIN 3 in1 and cervical cancer in one patient. Histopathology was normal in 121(93%) patients and abnormal (CIN and carcinoma) in 9(7%) patients. Histopathology showed cervicitis in 13%(out of normal histopathology report), CIN in eight(6%),cervical cancer in one patient(0.7%) and benign endometrial polyp in one patient(0.7%). The results were statistically significant with p value of <0.05. Sensitivity, specificity, PPV, NPV calculated for VIA were 100%, 96%, 53% &100% respectively vs 100%, 97%,75% and 100% for Pap smear, taking histopathology as gold standard.

Conclusion: Visual inspection of the cervix after acetic acid application is an effective method of detecting pre-invasive phase of cervical cancer and a good alternative to Pap smear screening for cervical cancer in low resource settings.

Key Words: VIA, Pap Smear, Cervical Cancer Screening

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INTRODUCTION

Cancer of the cervix is the second commonest cancer among the women worldwide. About 500,000 new cases are diagnosed each year and more than 90% of these new cases are in developing countries.[1] In 2012, about 270,000 women died of cervical cancer, and again out of these deaths 86% were in less developed countries.[2]

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Unfortunately, most women with cervical cancer in developing countries are diagnosed at late stages of the disease and have no access to lifesaving treatment or prevention options.[3] The main reason for these high figures in under developed countries is lack of effective screening programs. According to an estimate only about 5% of women in developing countries have been screened for cervical cancer in the past five years, as compared to about 85% in developed countries.[4, 5, and 6]

Cervical cancer is one of the most preventable forms of cancer and effective screening programs can lead to a significant reduction in the morbidity and mortality associated with this cancer.[7]Conventional cervical cytology (Pap smear) is the most widely used cervical cancer screening test in the world,[8,9] and effectively lowered the incidence of cervical cancer in developed countries but this method is not easy to implement in developing countries due to lack of trained and skilled personnel and healthcare resources.[10,11]

Screening is considered optimal when the smallest amounts of resources are used to achieve the greatest

benefit. Visual inspection of the cervix after application of 3-5% acetic acid (VIA) is an alternative sensitive screening method in many developing countries.[12,14] It is simple, cheap and non- invasive and the results are available instantly. Nurses, midwives, and other non-physician health care providers can be easily trained in VIA, and it can be done in a low level health facility like community, which can greatly improve access to cervical cancer prevention services.[15,16]

Cervical cancer accounts for about 3.6% of all cancers in Pakistani women .[17]Incidence of cervical cancer in Pakistan is 13.6/100,000 population and currently cervical cancer screening coverage is only 1.9%.[17] Screening through VIA is an attractive alternate in Pakistan also as there is no well-developed Pap smear screening program. This can help to increase this very low rate of screening for cervical cancer.

This study was done to determine agreement between Pap smear and VIA, as screening methods for cervical cancer in low resource-settings. The non-invasive nature and immediate results make VIA a useful screening test in developing countries like Pakistan. It would reduce the burden of work on the already burdened cytopathology units by screening subjects in outpatient departments who are VIA-negative and disease-free. Thus, only patients who are VIA-positive would need to undergo further diagnostic tests.

MATERIALS AND METHODS

After taking permission from hospital ethical committee we conducted this cross sectional study in OBGYN department UNIT II Fauji Foundation Hospital Rawalpindi from May 2013 to Dec 2014. VIA was performed by the doctors who were trained through workshops and have experience in colposcopy clinics. A total of 145 patients fulfilling inclusion criteria were included in the study after taking informed consent. These patients presented to Gynae OPD with various gynecological complaints. Patients with vaginal bleeding, history of cervical procedure and obvious carcinoma cervix were excluded from the study. Procedure was performed in dorsal position. After visualizing the cervix with sterile speculum, 5% acetic acid was applied with the help of cotton swabs on sponge holding forceps for one minute. Cervix was examined after few seconds of application for any aceto-white areas. Demographic characteristics and VIA findings as positive, negative or unsure were recorded on a proforma. VIA positive and unsure patients were asked to follow up in colposcopy clinic for colposcopic guided biopsy that was taken as the gold standard to assess visual inspection findings. Colposcopic guided SPSS 17 was used for statistical analysis.

RESULTS

A total of 145 patients were examined after fulfilling the inclusion criteria. Ten patients were lost to follow up for colposcopy and histopathology of 5 patients was missing. These patients were excluded from study. So our study population was composed of 130 patients. Descriptive statistics were calculated for demographic variables like age, parity, education, contraception history, risk factors for cervical carcinoma and socioeconomic status. Age range of our patients was between 25-79 years with average age of 46±9 years. Sixty seven percent of patients were illiterate, 18% were educated up to primary and 13% were educated up to secondary school and above. Sixty three percent patients were from satisfactory background. One hundred and twenty five (96%) patients were multiparous and 4% were primiparous. Eighty four percent of patients were using some form of contraception. Ninety eight percent of patients have no risk factor for cervical carcinoma.VIA was positive in 11%, negative in 78%, and unsure in 11%. PAP smear report was normal in 117 (90%) patients and abnormal in 13(10%) patients. Pap smear abnormality was CIN 1 in 11, CIN 3 in one and cervical cancer in one patient. Histopathology was normal in 121(93%) patients and abnormal (CIN and carcinoma) in 9(7%) patients. Histopathology showed cervicitis in 13%(out of normal histopathology report), CIN in eight(6%), cervical cancer in one patient(0.7%) and benign endometrial polyp in one patient(0.7%).The results are statistically significant with p value of <.05. Sensitivity, Specificity, PPV, NPV calculated for VIA are 100%, 92%, 46%, 100% respectively vs 100%, 96%, 69% and 100% for pap smear, taking histopathology as gold standard (table 1,2).

Table No.1: Efficacy of VIA

	Abnormal histo-pathology	Normal histo-pathology	Total(unsure via patient excluded)
Via positive	7	8	15
Via negative	0	101	101
	7	109	116

Sensitivity =100%, specificity=92%, PPV=46%, NPV=100%

Table No.2: Efficacy of Pap smear

	Abnormal histopathology	Normal histopathology	Total
Abnormal pap smear	9	4	13
Normal pap smear	0	117	117
	9	121	130

Sensitivity =100%, specificity=96%, PPV=69%, NPV=100%

DISCUSSION

VIA has emerged as a good alternative to Pap smear in developing countries due to the fact that 80% of cervical cancer occur in these countries and logistics for Pap smear are difficult to meet. Visual inspection of cervix through acetic acid is a noninvasive, rapid, cost effective and easy to perform test in detection of cervical intraepithelial neoplasia in low resource countries. Our study has confirmed the results of previous national and international studies. Our study showed that the sensitivity, specificity, PPV, and negative predictive value of VIA and Pap smear are comparable and VIA can replace Pap smear as a tool of cervical screening in low resource countries. A study conducted in Civil Hospital Karachi, Pakistan in 2012 showed similar results for VIA and concluded that visual inspection of the cervix after acetic acid application is an effective method of detecting pre-invasive phase of cervical cancer and a good alternative to cytological screening for cervical cancer in resource-poor setting like Pakistan.[19]Another study conducted in Sir Ganga Ram Hospital in 2012 revealed that there was a fair agreement between VIA and Pap smear.[20] A comparative study between Pap smear and VIA using histopathology as gold standard was conducted at Guwahati showed sensitivity of VIA even more than pap smear making VIA a more reliable test.[21]Another local comparative study conducted in PIMS(Pakistan institute of medical sciences) Hospital Islamabad also revealed similar results. According to that study visual inspection with acetic acid has significantly higher sensitivity than Pap smear and may replace pap smear as a primary screening tool for universal screening.[22] The higher sensitivity of VIA in these studies was attributed to the experience of the VIA provider which is also true for our study. All the providers in our study have done the VIA workshop and have experience in colposcopy clinic, so it is very important for the VIA provider to be trained and experienced .This issue should be kept in mind before implementing VIA as national screening program. All health care providers should be trained before reporting independently. According to our study VIA is 100% sensitive, 92% specific with a positive predictive value of 46% and negative predictive value of 100%, hence proved a very reliable test. The 100% NPV means that the women can be reassured if the test is negative. The low positive predictive value of VIA in our study is due to false positive report of eight patients. Seven of these patients had cervicitis on histopathology revealing that cervicitis could lead to false positive report. This can be reduced by more training of the health care providers in VIA reporting. Cervicitis and experience of the VIA provider has also been coated as reasons of false positive results in other studies.[22] A study conducted at Egyptian teaching hospital also showed low PPV for VIA of 26%. Sensitivity, Specificity, NPV of VIA are comparable to our study. According to this study VIA performance is comparable to Pap smear performance.[23] Another study conducted by Albert O at Zaria has 56% PPV and NPV of 96% which is comparable to our study. In14 (11%) patients the reporter was not sure about the VIA findings in our study. Out of these 3 patients have normal histopathology, eight has cervicitis, two CIN, and one benign endocervical polyp on histopathology report. We can conclude from this finding that in cervicitis the VIA will be either positive or unsure, and it is good to label the VIA as unsure for the beginners in VIA reporting if they are not confident enough to label as negative. Two patients of unsure VIA were labeled as CIN II after colposcopic guided biopsy. Our study limitations are that it is an opportunistic study and population was low risk for cervical cancer. Community based study is required before implementing VIA as national screening program.

CONCLUSION

Visual inspection of the cervix after acetic acid application is an effective method of detecting pre-invasive phase of cervical cancer and a good alternative to Pap smear. It can be used with confidence as a screening method for cervical cancer in resource-poor countries.

Recommendation: The lack of effective and implementable screening program lead to reporting of advanced cases of Ca Cervix. If detected at CIN or early stage Ca cervix, effective treatment can be provided with encouraging results. Therefore effective cervical cancer screening programme need to be implemented in our country.

Author's Contribution:

Concept & Design of Study:	Shahzadi Neelam
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Data Analysis:	Zartaj Hayat, Arifa Bari
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Final Approval of version:	Shahzadi Neelam, Zartaj Hayat

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REFERENCES

1. World Health Organization. Comprehensive Cervical Cancer Control. A Guide to Essential Practice. Geneva: World Health Organization Publication 2006.
2. Ferley J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. Globocan 2012 v 1.0, Cancer Incidence and Mortality Worldwide: IARC

CancerBase No. 11 [internet]. Lyon (France): International Agency for Research on Cancer; 2013. [cited 2015 Jan 20]. Available from: http://globocan.iarc.fr

3. Miller AB, editor. Epidemiological studies in cancer prevention and screening. New York: Springer Science and Business Media; 2013.
4. Albert SO, Oguntayo OA, Samaila MOA. Comparative study of visual inspection of the cervix using acetic acid (VIA) and Papanicolaou (Pap) smears for cervical cancer screening. E Cancer Med Sci 2012;6:262.
5. Program for Appropriate technology in Health. Cervical cancer prevention. The reproductive health outlook, Summer Edition 2003. Available at http://www.rho.org/assets/RHO_cxca_10-9-03 pdf
6. Miller A. Cervical cancer screening programmes: managerial guidelines. Geneva, World Health Organization, 1992.
7. Herdman C, et al. Planning appropriate cervical cancer prevention programs. Seattle, Program for Appropriate Technology in Health (PATH), 2000.
8. Sahasrabuddha W, Parham GP, Mwanahamuntu MH. Cervical cancer prevention on low and middle income countries; feasible, affordable, essential. Cancer Prev Res (Phila) 2012; 5:11-7.
9. Duraisamy K, Jaganathan KS, Bose JC. Methods of detecting cervical cancer. Adv Bio Res 2011;5: 226-32.
10. Blumenthal P, et al. Evaluation of supply and demand factors affecting cervical cancer prevention services in Rio Et Province, Thailand. Baltimore: J Hpiego 2004.
11. Rana T, Zia A, Sher S. Comparative evaluation of Pap-smear and VIA in cervical cancer screening programme in LWH, Lahore. Special Edition Ann 2010;16:104-7.
12. Gaffikin L, et al. Visual inspection with acetic acid as a cervical cancer test: accuracy validated using latent class analysis. BMC Medical Research Methodol 2007;7:36.
13. Sankaranarayanan R, et al. Effect of visual screening on cervical cancer incidence and mortality in Tamil Nadu, India: a clusterrandomised trial. Lancet 2007;370:398–406.
14. Ahmed I, Arja R, Vibeke R. Cervical cancer screening in primary health care setting in Sudan: a comparative study of VIAand Pap smear. Int J Women's Health 2012;4:67-73.
15. Blumenthal P et al. Safety, acceptability, and feasibility of a single-visit approach to cervical cancer prevention in rural Thailand: a demonstration project. Baltimore: Jhpiego; 2003.
16. Blumenthal PD, Lauterbach M, Sellors JW, Sankaranarayanan R. training for cervical cancer prevention programs in low-resource settings: focus on visual inspection with acetic acid and cryotherapy. Int J Ggynaecol Obstet 2005; Suppl 2: S30-S37.
17. WHO/ICO HPV Information Centre. Human papilloma virus and related cancers [internet]. 2010. Available from: http:www.who.int/ hpvcentre/publications/en
18. Nooh AM[1], Mohamed Mel-S, El-Alfy Y. Visual Inspection of Cervix With Acetic Acid as a Screening Modality for Cervical Cancer. J Low Gent Tract Dis 2015;19(4):340-4.
19. Khan M, Sultana SS, Jabeen N, Arain U, Khans S. Visual inspection of cervix with acetic acid: a good alternative to pap smear for cervical cancer screening in resource-limited setting. J Pak Med Assoc 2015;65(2):192-5
20. Naz U, Hanif S. Agreement between visual inspection with acetic acid and Papanicolaou's smear as screening methods for cervical cancer. J Coll physicians Surg Pak.2014Apr;24(4):228-31
21. 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(2):53-8
22. Ghazala M, Nasira T, Siama I. Comparison of Visual Inspection with acetic acid and Pap smear in cervical cancer screening at a tertiary care hospital. JPMA 2013.