COMMENTARY

Reasons for Variation in Sensitivity and Specificity of Visual Inspection with Acetic Acid (VIA) for the Detection of Pre-Cancer and Cancer Lesions of Uterine Cervix

Aditya Parashari, Veena Singh*

Abstract

Alternative strategies such as visual inspection of cervix with acetic acid, are real time, economical and easily implemented methods for cervical cancer screening. However, variable sensitivity and specificity have been observed in various community based studies. The possible reasons could include variation in man power training, light source used for visualization, and preparation of diluted (4-5%) acetic acid and its storage. A standardized protocol for training, teaching material (easy to understand in the local language) for trainees, supervision and reinforcement by intermittent and supplementary training to check the quality of their observation, a standard protocol for preparation dilute acetic acid and its storage and a standard good light source (equivalent to day light) are needed to minimize the variation in sensitivity and specificity of VIA in community settings.

Keywords: Cancer screening - cervical cancer - VIA - sensitivity of VIA - VIA training

Asian Pac J Cancer Prev, **14 (12)**, 7761-7762

Introduction

Alternative strategies are being proposed for early detection of cervical cancer in resource poor developing countries. Several investigators have suggested that visual examination of the cervix is an alternative to cervical cytology screening (Sankarnarayanan et al., 2012). Direct visual inspection of the cervix with acetic acid (VIA) is a real time, economical and easily implemented method for cervical cancer screening. This method has been shown to decrease the mortality from cervical cancer on a population level and can be readily adapted to a same-day "see and treat" protocol. The advantage of VIA is that the immediate screening result provides an opportunity to perform a biopsy and/ or treatment at the same visit (a "see and treat approach") reducing the likely hood of loss to follow-up.. However, VIA is having variable sensitivity and specificity (64.5-89.5%) vs. (76.4-84.2%) in various community based studies (Sangwa-Lugoma et al., 2006; Sherigar et al., 2010; Fei et al., 2011;). Some of the important causes of variations of sensitivity and specificity could be due to a). Man power training, b) Variation of light source and c). Procedure for preparation of 4-5 % acetic acid preparation, and its storage.

Man Power Training

VIA can easily be performed by trained paramedical staff after proper training under supervision. VIA by physician had a higher sensitivity and specificity compared to nurses. A moderate agreement was observed between physician and nurses in the performance of VIA screening and was found to be an acceptable test by both (Sangwa-Lugoma et al., 2006; Sherigar et al., 2010). However, because of number of false positive results intensive training and periodic reinforcement sessions are needed to reduce the cost of VIA screening and further management to the patient and the health care system (Sherigar et al., 2010).

Our study revealed a wide variation in acquiring clinical skills after exposure to the same set of didactic material and comparable clinical experience for different workers with the same master trainer. After training, these workers were given independent tasks of screening in the primary health care settings, without frequent supervision. This could have been the reason for a drastic decline in the performance, which, however, could be elevated after renewed training. It therefore appears that the use of manpower drawn from the community without previous experience of clinical examination, unlike that of trained nurses/auxiliary nurse/midwives, poses several problems for cancer screening without frequent supervision (Singh et al., 2012). Conditions of classroom didactic sessions and onsite (hands-on training) training are different altogether. In the classroom training for didactic session, illumination of images are standardized, whereas in field it is entirely different in the form insertion of speculum in the vagina, proper exposure of the cervix

*Division of Clinical Research, Institute of Cytology and Preventive Oncology (ICMR), Noida, India *For correspondence: singhveena52@yahoo.co.in*

in the presence of light, cleaning of mucus and blood etc., which alters the visualization of lesions of cervix. So far no data is available from any of the study on this aspect. Selection of trainer is also very important to impart proper training. She/ he should not be implanted from outside, but belongs to the same geographic area. She/he must be well acquainted with the local language and culture to build a rapport and to develop a confidence amongst the trainees. Further, the training and teaching material should also be available in local language. The trainer should act as a mentor and supervisor instead of only a simple trainer to impart training to the trainees. The second most important aspect is the material and content of the training, especially when it is to be given to high school pass trainees. Content should be designed in the local language and the mental levels of high school pass candidates, so that it could be understandable to them. In any of the study content/ course material was not evaluated from the trainee point of view by taking their feedback. In most of the studies, IARC material was used which was evaluated by technical persons who already have some sort of clinical background.

Variation in the Light Source

Second reason for variation in sensitivity and specificity of VIA could be due to variation in the light source. Generally people used yellow light of tungsten bulb fitted in torch or in the examination light in field settings. The intensity of light is dependent on the power and duration of battery. A good torch light due to its tungsten bulb, gives yellow light with spectrum range of 4000 to 4500 A^0 only, whereas, white light has a spectrum range of white light (equivalent to day light) in between 5500 to 6000A^0. In one of the study, an illuminated magnifying device Magnivisualizer® having interchangeable magnification (2× to 5×) was used to detect pre-cancerous and early cancerous lesions of uterine cervix. The Magnivisualizer improved the detection rate of early cancerous lesions from 60%, for unaided visual inspection to 95%. It also permitted detection 58% cases of low grade dysplasia and 83% cases of high-grade dysplasia. None of these cases were detectable by unaided visual inspection (Parashari et al., 2000). Torch light lacks the complete spectrum of light which causes a masking effect on the cervix for visualization of the lesions. The agreement for lesions between colposcopy and the yellow light was observed (Proportion agreement 84.4% and the kappa statistics was only 0.533 with a moderate agreement). Whereas the corresponding agreement between colposcopy and white light of Magnivisualizer (R) was observed in (Proportion agreement 94.0% and the kappa statistics was 0.86 almost perfect agreements) (Singh et al., 2013).

Procedure for Preparation of 4-5% Acetic Acid Preparation, and its Storage

Third important reason could be due to the individual preparation of 4-5% acetic acid. It has been observed in the field situation that various diluents like distilled water, normal saline (supplied by hospital), tap water or ground water are used for preparation of acetic acid. Due to variation in hardness and other impurities in the water, the available percentage of acetic acid in the solution varies because of the formation acetate salts. Some time the 4-5% acetic acid (if not prepared fresh) will be diluted (Acetic acid have high evaporation rate). Even the concentrated acetic acid (Glacial acetic acid) will not be the same after frequent opening. In addition in some of the studies a low concentration (3 %,) of acetic acid is also used instead of 4-5% due to the complaints of burning sensation by patients.

Thus, a standardized protocol for training of master trainer, standardized teaching material (easy to understand in local language) for trainees, a protocol for supervision and reinforcement of intermittent and supplementary training to check the quality of their observations, well standardized protocol for preparation of fresh 4-5% acetic acid and its storage and most important a standard good light source (capable to give the light equivalent to day light) are needed to minimize the variation in sensitivity and specificity of VIA in community settings.

References

Fei HL, Cheng YF, Cheng XD, et al (2011). Evaluation of five screening methods for an early detection of cervical cancer and its precancerous lesions in Zhejiang province. *Zhonghua Yi Xue*. **91**, 309-12.

Parashari Aditya, Singh V, Sehgal A, et al (20000. Low-cost technology for screening uterine cervical cancer. *Bull WHO*. **78**, 964-7.

Sankarnarayanan R, Nessa A, Esmy PO, et al (2012). Visual inspection methods for cervical cancer prevention. *Best Pract Res Clin Obstet Gynaecol*, **26**, 221-32.

Sangwa-Lugoma G, Mahmud S, Nasr SH, et al (2006). Visual inspection as a cervical cancer screening method in a primary health care setting in Africa. *Int J Cancer*, **119**, 1389-95.

Sherigar B, Dalal A, Durdi G, et al (2010). Cervical cancer screening by visual Inspection with acetic acid - interobserver variability between nurse and physician. *Asian Pac J Cancer Prev*, **11**, 619-22.

Singh V, Parashari A, Sehgal A (2012). Man power training for early cervical cancer detection. *Acta Obstet Gynecol Scand*, **91**, 1124-7.

Singh V, Parashari A, Sehgal A (2013). VIA screening for cervical cancer in developing countries: Potential role of the light source. *J Obstet Gynaecol*, **33**, 898-99.