THE JOURNAL OF OBSTETRICS AND GYNECOLOGY OF INDIA

The Journal of Obstetrics and Gynecology of India (July–August 2014) 64(4):284–288
DOI 10.1007/s13224-014-0513-8

ORIGINAL ARTICLE

Correlation of Cytology and Colposcopic Findings Using Reid's Index in VIA-Positive Women

Dharaiya Nisarg · Maitra Nandita

Received: 19 February 2013 / Accepted: 21 January 2014 / Published online: 12 April 2014

Abstract

Introduction Cervical cancer is the most common cancer among Indian women. Only 5 % of women in developing countries have ever been screened for cervical abnormalities.

Objectives To study the correlation of cytology and colposcopy in VIA-positive women attending the Gynaecology clinic.

Materials and Methods This prospective cross-sectional study on 200 symptomatic women compares the role of cytology and colposcopy in the assessment of subjects testing positive for acetowhite lesions on the cervix after application of 5 % acetic acid (VIA).

Results 200/637 women screened in OPD tested VIA positive, giving a positivity rate of 31 %. Six smears were reported as LGSIL or HGSIL giving a cytological abnormality rate of 3 %. The association between cytology and Reid's score was statistically significant at a p value of 0.02. Of the 4 cases with biopsy-confirmed invasive cancer, cytology reported 2 as LGSIL and 2 as HGSIL. Colposcopy reported all these women as CIN 2/3.

Conclusion The accuracies of Pap smear cytology and colposcopy in the diagnosis of precancerous and cancerous lesions of cervix were good.

Dharaiya N. (✉), Resident · Maitra N., Additional Professor
Department of Obstetrics and Gynecology, Baroda Medical College, Baroda, India
e-mail: nisarg.dharaiya@gmail.com

Keywords Cervical cancer · Colposcopy · Reid's Index · VIA positivity

Introduction

Cervical cancer is the most common cancer among Indian women, and age-standardized incidence ranges from 17.2 to 55 per 100,000 women in different regions of India [1, 2]. By 2030, cervical cancer is expected to kill over 474,000 women per year and 95 % of these deaths are expected to be in low- and middle-income countries [3].

Despite its public health importance there are no effective prevention programs in most developing countries and hence the risk of disease and death from cervical cancer remains largely uncontrolled. Only 5 % of women in developing countries have ever been screened for cervical abnormalities [4, 5].

The best way to screen for cervical cancer is a Papanicoloau (PAP) test which may be done alone or in combination with an HPV DNA test for women age 30 and older [2]. Today, new alternatives to PAP test represent a breakthrough in our ability to deliver effective cervical cancer prevention even in low resource settings. The Alliance for Cervical Cancer Prevention (ACCP) has proved that VIA and VILI are as effective or even more effective than the PAP test at identifying precancerous lesions and when these techniques are combined and correlated with colposcopy their efficacy doubles for screening purposes [6].

This study was undertaken to study the correlation of cytology and colposcopy in VIA-positive women attending the Gynaecology clinic for symptomatic complaints.

Materials and Methods

Two Hundred apparently healthy (No gross complains suggestive of any cervical malignancy like post coital bleeding, foul smelling discharge, post menopausal bleeding etc.) females in the age group of 30–59 yrs who presented with discharge per vaginum, menstrual complaints were recruited. Pregnant women, women less than 3 months postpartum, women who have undergone hysterectomy, and women with prior history of cervical cancer or pelvic radiation were excluded.

Demographic data that included age, marital status, obstetric history, and gynecological history were obtained. PAP smear was taken using Ayre's spatula and cytobrush followed by visual inspection following application of acetic acid (VIA). All slides were processed at the department of Histopathology, Medical College, Baroda; using the PAP method and graded according to the revised Bethesda system (2001). They were examined by the same cytopathologist to maintain consistency in reporting. In cases where VIA was positive or suspicious for cancer, the patient was enlisted for colposcopic examination. If visual detection test results did not show any abnormality but the cytological finding was positive, a 4-quadrant biopsy was taken. Colposcopic assessment followed the technique of assessing abnormal areas after application of acetic acid followed by Lugol's iodine and assessment of Reid's index [7]. Colposcopy results were categorized as normal, squamous metaplasia, inflammation, CIN 1, CIN 2/3, and invasive cancer. Colposcopy was considered unsatisfactory if the squamocolumnar junction was not visible completely and these women were subjected to an endocervical curettage (ECC). Directed punch biopsies were taken from colposcopically abnormal areas. These specimens were sent to the Histopathology Department of Medical College, Baroda.

Subjects were asked to come after 2 weeks or earlier for follow-up if they had any complaints. PAP test reports and biopsy reports were reviewed along with any complaints. The reference standard for defining the final disease status was the biopsy or negative colposcopy. Women requiring treatment of precancerous lesions were assigned to treatment by cryotherapy, loop electrosurgical excision procedure (LEEP), or surgery.

Data were entered in an Excel sheet. Test of proportion was used to compare various diagnostic characteristics between the methods. The outcome measures used to evaluate VIA, VILI, and cytology testing were the following: the detection rate of abnormal cytology, the detection rates of CIN and invasive cancer, and correlation between cytology and colposcopy. Data analysis was done by computer software IBM SPSS version 19.

Results

Six hundred and thirty-seven women with complaints of vaginal discharge, lower abdominal pain, abnormal uterine bleeding, postcoital bleeding, and post-menopausal bleeding underwent VIA. Two hundred tested VIA positive (31.3 %). All these subjects underwent PAP smear and Colposcopy.

In 98 (49 %) women, colposcopy showed evidence of CIN; 13 subjects required ECC and cervical biopsy for confirmation of diagnosis. One hundred and forty-four (72 %) women were in the age group of 31–50 years. Twenty-nine (14.5 %) women were above 50 years of age. Twenty-five (12.5 %) smears were reported as normal, 159 (79 %) reported as inflammatory, 4 (2 %) reported as LGSIL, and 2 (1 %) reported as HGSIL. On colposcopy, 102 (51 %) women had normal cervix on examination, 86 (43 %) women had CIN 1, and 12 women (6 %) had CIN 2/3.

Table 1 shows the distribution of women by age group and cytology. Six women in the age group of 41–60 years had LGSIL/HGSIL reported on cytology. The association between age and abnormal cytology was found to be significant at a p value of <0.01. Table 2 shows the distribution of subjects by age group and Reid's index. One hundred and four women (52 %) had a Reid's index score of 0–2; 95 (47.5 %) had a score of 3–4; and one had a score of 5. The association between age and Reid's index score was found to be not significant. This association between colposcopic diagnosis and Reid's score was significant at $p < 0.0000$.

Table 3 shows colposcopic diagnosis and parity. Of the 31 women with parity more than 3, 5 (16.1 %) had CIN 2/3 and 26 (83.9 %) had a normal or CIN 1 findings on colposcopy. The association between parity and colposcopic diagnosis was significant. Table 4 shows the association between cytology and Reid's score. Six women with a Reid's score of 3–5 had abnormal (LGSIL/HGSIL) on cytology. This association between cytology and Reid's score was statistically significant at a p value of 0.02.

The result of the punch biopsy was used as the gold standard for cervical pathology. Eight women had acute or chronic cervicitis on histopathology and 4 had invasive carcinoma. Of the 12 women with CIN 2/3, 4 were detected to have invasive carcinoma, 5 had acute/chronic cervitis, one report was not satisfactory, one report showed complex endometrial hyperplasia, and one patient declined biopsy.

Table 1 Distribution of subjects by age group and cytology report

Age distribution	Cytology report										
	Normal		Inflammation		LGSIL		HGSIL		Unsatisfactory	Total	
	No.	%	No.	%	No.	%	No.	%	No. (%)	No.	%
21–30	2	7.4	22	81.48	0	0.0	0	.0	3 (11.1)	27	100
31–40	10	12.9	63	81.8	0	0.0	0	.0	4 (5.1)	77	100
41–50	11	16.41	52	77.6	2	3.0	1	1.5	1 (1.5)	67	100
51–60	2	6.9	22	75.8	2	6.9	1	3.4	2 (6.9)	29	100

Unsatisfactory smear ($n = 10$) not included in analysis

Table 2 Distribution of subjects by age group and Reid's index

Age	Reid's index							
	2		3–4		5		Total	
	No.	%	No.	%	No.	%	No.	%
21–30	17	63	10	37.03	0	0	27	100
31–40	38	49.3	39	50.6	0	0	77	100
41–50	37	55.2	29	1.5	1	1.5	67	100
51–60	12	41.4	17	58.6	0	0	29	100

Table 3 Colposcopic diagnosis and parity

Parity	Colposcopy diagnosis							
	Normal		CIN 1/HPV infection		CIN 2/3		Total	
	No.	%	No.	%	No.	%	No.	%
1–3	92	54.43	70	41.4	7	4.1	169	84.5
>3	10	32.2	16	51.6	5	16.1	31	15.5

Table 4 Cytology report and Reid's index score

Cytology report	Reid's index							
	2		3–4		5		Total	
	No.	%	No.	%	No.	%	No.	%
Normal	18	17.3	7	7.4	0	.0	25	12.5
Inflammation	77	74.0	82	86.3	0	.0	159	79.5
LGSIL	0	.0	4	4.2	0	.0	4	2.0
HGSIL	0	.0	1	1.1	1	100	2	1.0
Total	104	100	95	100	1	100	200	100

Ten unsatisfactory smears not included in analysis in this group

No follow-up is available for this patient. Thus, colposcopy was able to detect all the 4 women with invasive cancer.

Four women with invasive carcinoma underwent radical surgery, 52 (26 %) underwent surgery for benign disease, 109 (54.5 %) were given a course of antibiotics, 7 (3.5 %) underwent cryotherapy, and 28 (14.0 %) received no treatment.

Discussion

This small prospective cross-sectional study on 200 symptomatic women compares the role of cytology and colposcopy in the assessment of subjects testing positive for acetowhite lesions on the cervix after application of 5 % acetic acid (VIA). The VIA positivity rate of 31 % is high compared to the rates quoted in literature. A community-based study by Basu et al. [8] on 5,843 women has quoted a rate of 18.7 %. A previous yet to be published study in our own facility found a positivity rate of 27 %. A major limitation of VIA is it's low specificity leading to a high rate of referrals. Acetowhite areas due to immature squamous metaplasia and inflammatory lesions seem to be responsible for a large number of false-positive findings.

In our study we have used the spatula first technique as recommended by Rahnama et al. [9]. This study found that the quality of the PAP smear can be improved by using the Ayre spatula first followed by the endocervical brush. Fewer smears will be contaminated by blood which may result in more squamous intraepithelial lesions being detected. Five (3 %) of subjects had LGSIL/HGSIL on cytology. ASCUS was not used as a diagnostic category by

the cytopathologist in this study due to lack of clarity in the definition, diagnosis, and management [10].

In a study on 28,469 women by Yalti et al., LGSIL was detected in 67 patients (0.23 %) and HGSIL was detected in 43 patients (0.15 %). Minor cytologic abnormalities—LGSIL and ASCUS—are the most frequent findings observed in smears performed in screening for cervical cancer [11].

All subjects in our study underwent colposcopy. Two prospective trials have shown that in LGSIL and HGSIL lesions, immediate referral to colposcopy is a safer and more effective option [12, 13]. Fallani et al. [14] concluded that patients with ASCUS or LGSIL PAP smears exhibit a wide spectrum of histologic findings, ranging from no pathologic abnormality to frequent high-grade CIN and invasive carcinoma in rare cases. Because of the histologic assessment by directed punch biopsy and its therapeutic indications, colposcopic examination is recommended for all women with a cytologic diagnosis of ASCUS and LGSIL.

Six women with a Reid's score of 3–5 had abnormal (LGSIL/HGSIL) on cytology. This association between cytology and Reid's score was statistically significant at a p value of 0.02. The British Columbia Cytology—Colposcopy program on 84,244 women found that the colposcopic impression correlated with the referral cytology within one degree in over 90 % of cases. The predictive accuracy of colposcopy increased with advancing severity of disease expected. As the degree of cytological abnormality worsened, the predictive accuracy of colposcopic diagnosis increased [15].

Twelve subjects underwent colposcopy-directed biopsy. Eight women had acute or chronic cervicitis on histopathology and 4 had invasive carcinoma. Thus, colposcopy was able to detect all the 4 women with invasive cancer. In our study, two women reported with LGSIL on cytology were found to have invasive cancer on colposcopy-guided biopsy. Appropriate management of women with LGSIL cytology remains inconclusive. Some believe that patients may be followed up by repeat smears. The rationale for this is that women with LGSIL have no significant lesion and if they do, these will regress spontaneously. However, in a study by Phongnarisorn et al. [16] 40 % of the invasive cancer identified was in women with LSIL cytology.

As colposcopy is a subjective assessment, not all abnormalities have distinctive appearances. In the British Columbia study, only 76 and 50 % on colposcopy had histologically confirmed CIN 1 and CIN 2 or worse disease. The ALTS study has suggested that high-grade CIN might not always be at the site of the highest colposcopic abnormality [17].

This small study has demonstrated the usefulness of these two diagnostic procedures as screening tests in preclinical cervical cancer. The accuracies of Pap smear cytology and colposcopy in the diagnosis of precancerous and cancerous lesions of cervix were good. Using colposcopy, the difficulty was in differentiating between CIN 2 and 3 lesions. Using Pap smear, two cases of invasive carcinoma were reported as LGSIL. Specific diagnosis in these two techniques is very highly operator dependent and subjective. In either of the techniques, there was a tendency to underdiagnose the carcinoma.

The specificity of diagnosis by colposcopy is of secondary importance because all patients who are screened as malignant will undergo a biopsy and receive appropriate treatment despite inaccuracies in categorization of the preclinical cancer. As women in low-resource countries are referred to colposcopy based on visual screening methods with a high positivity rate, it is vital to have a triaging investigation like colposcopy practiced competently in public health settings.

References

1. Shastri SS, Dinshaw K, Amin G, et al. Concurrent evaluation of visual, cytological and HPV testing as screening methods for the early detection of cervical neoplasia in Mumbai, India. Bull World Health Organ. 2005;83:186–94.
2. Murthy NS, Juneja A, Sehgal AA, et al. Cancer projection by the turn of century—Indian scene. Indian J Cancer. 1990;27:74–82.
3. Ferlay S, Bray F, Pisani P, et al. Globocan 2000: cancer incidence, mortality and prevalence worldwide. Version 1.0. IARC Cancer, Base No. 5. Lyon: IARC Press; 2001.
4. World Health Organisation, Comprehensive cervical cancer control: a guide to essential practice. Geneva, WHO, 2006. http://www.who.int/reproductivehealth/publications/cancer/9241547006/en/index.html; http://www.who.int/healthinfo/global-burden-disease/projections/en/index.html. Accessed 19 Jan 2013
5. Cancer fact sheet – GLOBOCAN 2008, Projection of mortality & burden of disease 2004–2030. WHO. www.globocan.iarc.fr.
6. Chase DM, Kalouyan M, DiSaia PJ. Colposcopy to evaluate abnormal cervical cytology in 2008. Am J Obstet Gynecol. 2009;200(5):472–80.
7. Sellors JW, Sankaranarayanan R. Colposcopy and treatment on cervical intraepithelial neoplasia: a Beginners' manual. Lyon: IARC Press; 2003.
8. Basu PS, Sankarnarayanan R, Mandal R, et al. Visual inspection with acetic acid and cytology in the early detection of cervical neoplasia in Kolkata, India. Int J Gynecol Cancer. 2003;13:626–32.
9. Rahnama P, Faghizadeh H, Ziaei S. Effect of the sampling sequence on the quality of Papanicolaou smear. Int J Gynecol Cancer. 2005;15:66–9.
10. McGrath CM. ASCUS in Papanicolaou smears. Problems, controversies, and potential future directions. Am J Clin Pathol. 2002;117:62–75.
11. Yalti S, Gurbuz B, Bilgic R, et al. Evaluation of cytologic screening results of the cervix. Int J Gynecol Cancer. 2005;15:292–4.
12. Flannelly G, Anderson D, Kitchener HC, et al. Management of women with mild and moderate cervical dyskaryosis. Br Med J. 1994;308:1399–403.

13. Shafi MI, Luesley DM, Jordan JA, et al. Randomised trial of immediate versus deferred treatment strategies for the management of minor cervical cytological abnormalities. Br J Obstet Gynaecol. 1997;104:590–4.
14. Fallani MG, Penna C, Fambrini M, et al. Cervical cytological reports of ASCUS and LSIL. Cyto-histological correlation and implication for management. Minerva Ginecol. 2002;54:263–9.
15. Benedet JL, Matisic JP, Bertrand MA. An analysis of 84244 patients from the British Columbia cytology—colposcopy program. Gynecol Oncol. 2004;92(1):127–34.
16. Phongnarisorn C, Srisomboon J, Siriaungkul S, et al. Women in a region with high incidence of cervical cancer warrant immediate colposcopy for low-grade squamous intraepithelial lesion on cervical cytology. Int J Gynecol Cancer. 2006;16:1565–8.
17. Guido RS, Jeronimo J, Schiffman M, et al. The distribution of neoplasia arising on the cervix: results from the ALTS trial. Am J Obstet Gynecol. 2005;193:1331–7.