RESEARCH ARTICLE

Diagnostic Value of Endocervical Curettage for Detecting Dysplastic Lesions in Women with Atypical Squamous Cells of Undetermined Significance (ASC-US) and Low Grade Squamous Intraepithelial Lesion (LSIL) Papanicolaou Smears

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Abstract

Background: To determine the frequency of dysplastic lesions in the endocervical curettage (ECC) specimens of women with ASC-US and LSIL Pap and to evaluate the possible factors associated with high grade dysplasia in those ECC specimens. Materials and Methods: Two hundred and sixty patients with ASC-US and LSIL cytologic smears who underwent an ECC at the time of colposcopic examination during January 2010 and December 2012 were reviewed. Demographic and clinicopathologic data were collected. Multivariate analysis using binary logistic regression was used to identify factors that might be associated with high grade endocervical dysplasia. Results: The frequency of endocervical dysplasia was 7.7% (20 out of 260 patients). Cervical intraepithelial neoplasia (CIN) 1 and CIN 2-3 lesions in the endocervical canal were observed in 12 and 8 patients, respectively. No microinvasive or invasive cervical cancers were identified. There was no difference in the frequency of high grade endocervical dysplasia between the patients with satisfactory and unsatisfactory colposcopic examinations (1.4% *vs* 5.1%, respectively, p=0.087). A multivariate logistic regression analysis demonstrated a significant association between high grade CIN on ectocervical biopsy as well as LSIL cytologic smears and high grade dysplasia in endocervical canal (OR=0.046, 95%CI=0.007-0.288; p=0.001 and OR=0.154, 95%CI=0.025-0.942; p=0.043, respectively). Conclusions: The frequency of high grade endocervical dysplasia in women with ASC-US and LSIL cytologic smears was low. Therefore, routine performance of ECC in those women is debatable. High grade ectocervical dysplasia and LSIL cytologic smears may be used as predictors for high grade dysplasia in endocervical canal and ECC in these patients is reasonable.

Keywords: Endocervical curettage - cervical intraepithelial neoplasia - endocervical dysplasia

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Introduction

Endocervical curettage (ECC) is the procedure which involves circumferential scraping of the endocervical canal with a curette. Some colposcopists prefer to perform ECC in all colposcopic examinations of nonpregnant women, even though the colposcopic findings are normal and the entire transformation zone can be visualized. They believe that ECC performance can avoid missing of an occult preinvasive and invasive cervical cancers in the endocervical canal (Ferenczy, 1995; Pretorius et al., 2004; Puntachai et al., 2011; Schneider et al., 2012; Shaco-Levy et al., 2013). On the other hand, other colposcopists suggest that ECC is an unnecessary procedure and should be done only in selected cases (Massad and Collins, 2003; Solomon et al., 2007; Gage et al., 2010). There are several limitations of performing ECC, including its potential painful procedure, difficulty in pathologic interpretation owing to small, fragmented specimens with insufficient stroma, and contamination of ECC specimens with ectocervical lesion during the collection process. The latter could potentially result in an overtreatment as a result of suspected endocervical lesion despite having no pathology (Driggers and Zahn, 2008; Goksedef et al., 2013).

Previous studies showed that the prevalence of occult high grade cervical intraepithelial neoplasia (CIN 2-3) in the endocervical canal of women with atypical squamous cells of undetermined significance (ASC-US) and low grade squamous intraepithelial lesion (LSIL) Pap result was 0.8-4.0%, whereas its prevalence reached 25-30% in women with high grade squamous intraepithelial lesion (HSIL) Pap result (Moniak et al., 2000; Molano et al.,

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2002; Miranda et al., 2006; Khuakoonratt et al., 2008; Rose et al., 2012; Goksedef et al., 2013). Therefore, it seems reasonable to perform the ECC in women who have HSIL Pap. However, performing ECC in women with ASC-US and LSIL Pap is still controversial.

The American Society for Colposcopy and Cervical Pathology recommends ECC in women who have high grade cytology, low grade cytology without identified lesion on colposcopic examination, or unsatisfactory result of colposcopic examination. However, women with low grade cytology with a satisfactory colposcopy and identified lesion, the ECC is considered "acceptable" to be performed (Massad et al., 2013). Therefore, based on the recommendation, performing ECC is controversial in women with ASC-US and LSIL Pap.

We aimed to determine the frequency of dysplastic lesion in the ECC specimens of women with ASC-US and LSIL Pap and to evaluate the possible factors associated with high grade dysplasia in those ECC specimens.

Materials and Methods

Three-hundred and ten women with ASC-US and LSIL Pap who underwent colposcopy between January 2010 and December 2012 were retrospectively reviewed. There were 260 out of 310 patients who had an ECC performed at the time of colposcopic examination and were enrolled in this study. The patients who did not have pathological results were excluded. Demographic data including age, parity, menopausal status, age at first sexual intercourse, and the pathological results of colposcopic directed biopsy and ECC were collected.

All colposcopic examinations were performed by our gynecologic oncologists. Satisfactory colposcopic examination was considered if the entire transformation zone and margin of the visible lesion were clearly identified. Cervical tissue was obtained from the lesion suspicious of CIN under the colposcopic examination and then ECC was performed according to each gynecologic oncologist's decision. The ECC involves scraping of the entire endocervical canal by using a Novak curette. Both cervical and endocervical tissues were introduced in a formalin-filled container and sent to the pathology laboratory for histological diagnosis. Histological interpretation was classified into 3 categories, including no CIN, CIN 1, and CIN 2-3 lesions.

SPSS version 15.0 was used for the data analysis. Associations among clinicopathological features of the patients and ECC pathological results were evaluated using Chi-squared analysis. A multivariate analysis was performed using binary logistic regression analysis to determine factors associated with dysplastic endocervical lesions.

Results

The mean±SD age of the patients was 37.0±9.7 years. Two hundred and thirty-two out of 260 (89.2%) women were premenopausal, and 28 (10.8%) women were menopausal. One hundred and fifty-two (58.5%) women had ASC-US smears, and the remaining women had LSIL smears. Table 1 summarizes the clinical characteristics of the enrolled patients.

Colposcopic examination was satisfactory in 142 (54.6%) patients. Twenty (7.7%) patients had endocervical dysplasia identified on ECC, 12 (4.6%) had CIN 1 and 8 (3.1%) had CIN 2-3. Thirty-eight (14.6%) patients had

Table 1. Demographic and Clinical Characteristics of the Enrolled 260 Patients

		N (%)
Age (years)	≤40	157 (60.4)
	>40	103 (39.6)
Parity	Nulliparous	80 (30.8)
	Multiparous	180 (69.2)
Menopausal status	Premenopause	232 (89.2)
	Postmenopause	28 (10.8)
Number of partners	1	150 (57.7)
	≥2	110 (42.3)
Pap results	ASC-US	152 (58.5)
	LSIL	108 (41.5)

*ASC-US, atypical squamous cells of undetermined significance; LSIL, low grade squamous intraepithelial lesion

Table 2. Clinicopathologic Features of the Enrolled 260 Patients

Clinicopathologic features		N (%)
Satisfactory colposcopy		142 (54.6)
Cervical biopsy results	No CIN	120 (46.2)
	CIN 1	102 (39.2)
	CIN 2-3	38 (14.6)
	Invasive cancer	0
ECC results	No CIN	240 (92.3)
	CIN 1	12 (4.6)
	CIN 2-3	8 (3.1)
	Invasive cancer	0

*CIN, cervical intraepithelial neoplasia; ECC, endocervical curettage

Table 3. Bivariate Analysis for the Associations between Clinicopathological Features and Endocervical Dysplasia

	ECC results, N (%)		
Factors	Less than CIN 2	CIN 2-3	p value
Age (years)			0.532
≤40	153 (97.5)	4 (2.5)	
>40	99 (96.1)	4 (3.9)	
Age at first SI			0.655
<20	106 (96.4)	4 (3.6)	
≥20	146 (97.3)	4 (2.7)	
Number of partners			0.057
1	148 (98.7)	2 (1.3)	
≥2	104 (95.4)	6 (5.6)	
Pap results			0.051
ASC-US	150 (98.7)	2 (1.3)	
LSIL	102 (94.4)	6 (5.6)	
Satisfactory colposcopy			0.087
Yes	140 (98.6)	2 (1.4)	
No	112 (94.9)	6 (5.1)	
Cervical biopsy results			< 0.01
Less than CIN 2	220 (99.1)	2 (0.9)	
CIN 2-3	32 (84.2)	6 (15.8)	

*SI, sexual intercourse; ASC-US, atypical squamous cells of undetermined significance; LSIL, low grade squamous intraepithelial lesion; CIN, cervical intraepithelial neoplasia

CIN 2-3 on ectocervical biopsies. Table 2 summarizes the pathological results of the colposcopic directed biopsy and ECC. Six out of the 8 patients who had high grade endocervical dysplasia also had high grade CIN on ectocervical biopsy. Thus, only 2 of 260 (0.8%) patients with ASC-US and LSIL Pap had high grade CIN identified only on their ECC. Table 3 shows the associations among clinicopathological features and endocervical dysplasia. Bivariate analysis demonstrated a statistically significant association between high grade endocervical dysplasia and high grade CIN of ectocervical biopsy specimens ($p < 0.01$). There was a trend toward association between LSIL Pap smears and high grade endocervical dysplasia ($p=0.051$). The frequency of high grade endocervical dysplasia were not different between the patients who had satisfactory and unsatisfactory colposcopic examinations [2 out of 142 (1.4%) *vs* 6 out of 118 (5.1%), respectively, $p=0.087$]. Table 4 demonstrates the pathological results of ECC in patients with satisfactory and unsatisfactory colposcopic examinations. Of 122 patients without CIN 2-3 lesions of ectocervical biopsy specimens, 2 of them were diagnosed as having high grade endocervical dysplasia on ECC despite the satisfactory colposcopy.

Table 4. Pathological Results of ECC According to Colposcopic Findings and Ectocervical Biopsy Results

Colposcopic directed ectocervical biopsy results	ECC results, N (%)		
	No CIN	CIN 1	CIN 2-3
Unsatisfactory colposcopy (N=118)			
Ectocervical biopsy results			
Less than CIN 2	96 (96)	4 (4)	0
CIN 2-3	10 (55.6)	2 (11.1)	6 (33.3)
Satisfactory colposcopy (N=142)			
Ectocervical biopsy results			
Less than CIN 2	116 (95.1)	4 (3.3)	2 (1.6)
CIN 2-3	18 (90)	2 (10)	0

*ECC, endocervical curettage; CIN, cervical intraepithelial neoplasia

Table 5. Multivariate Analysis of the Factors that May be Associated with High Grade Endocervical Dysplasia on ECC

Factors	OR (95%CI)	p value
Age (years)		
≤40	Reference	
>40	1.733 (0.254-11.804)	0.574
Age at first SI (years)		
<20	Reference	
≥20	0.980 (0.183-5.243)	0.981
Number of partners		
1	Reference	
≥2	0.544 (0.082-3.618)	0.529
Pap results		
ASC-US	Reference	
LSIL	0.154 (0.025-0.942)	0.043
Satisfactory colposcopy		
Yes	Reference	
No	0.309 (0.041-2.328)	0.255
Biopsy results		
Less than CIN 2	Reference	
CIN 2-3	0.046 (0.007-0.288)	0.001

SI, sexual intercourse; ASC-US, atypical squamous cells of undetermined significance; LSIL, low grade squamous intraepithelial lesion; CIN, cervical intraepithelial neoplasia; OR, odds ratio; 95% CI, 95% confidence interval

Multivariate analysis comfirmed the associations between high grade ectocervical biopsy specimens, LSIL Pap results and high grade endocervical dysplasia on ECC (Table 5).

Discussion

Only 8 of 260 (3.1%) patients with ASC-US and LSIL Pap had CIN 2-3 lesions in endocervical canal. The frequency of high grade endocervical dysplasia in patients with ASC-US and LSIL Pap of our studied population was comparable to that reported in previous studies (0.8-4.0%) (Miranda et al., 2006; Solomon et al., 2007). Massad, et al (Massad et al., 2013) reported that the patients with all grades of abnormal cervical smears with unsatisfactory colposcopy had a higher prevalence of dysplastic lesion in endocervical canal than those with satisfactory colposcopic examination (31% *vs* 17%). However, our study demonstrated no statistically significant difference in the rate of high grade endocervical dysplasia between the patients with unsatisfactory and satisfactory colposcopic examination (5.1% *vs* 1.4%, $p=0.087$). The conflicting result between the Massad's study and our study may partly be due to relatively low frequency of high grade endocervical dysplasia in our patients with low grade cervical cytologic smears. However, the Massad's study included all grades of abnormal Pap results which involved HSIL Pap. This could contribute to the particularly high frequency of high grade endocervical dysplasia found in their study.

Williams et al (2000) reported that the rate of dysplastic lesion in the endocervical specimens of their patients with ASC-US and LSIL smears who had a satisfactory colposcopic examination was 4 out of 159 (2.5%) patients, but all of those patients had only mild endocervical dysplasia. Therefore, they suggested that ECC might be safely avoided in those women. Only 2 of 142 (1.4%) patients of our study who had satisfactory colposcopic examination had high grade endocervical dysplasia. Our findings supported that the frequency of high grade endocervical dysplasia was extremely low in women with low grade cervical cytologic smears who had satisfactory colposcopy. Based on this result, ECC may be omitted in these women.

Massad et al. (2003) evaluated the predictors of abnormal ECC result in patients with all grades of abnormal cytologic smears. They demonstrated that older women, multiparity, earlier age of first sexual intercourse, and unsatisfactory colposcopy were the factors associated with abnormal ECC results. In contrast, our study found that there were no associations between age, parity, age at first sexual intercourse as well as unsatisfactory colposcopy and high grade dysplasia lesions in endocervical canal. However, we found that high grade endocervical dysplasia was associated with high grade ectocervical dysplasia and LSIL cytologic smears. Therefore, we suggested that ECC might be performed to evaluate the endocervical canal in patients who had LSIL smears and/or suspected high grade lesion on colposcopic findings.

The strength of our study was that all colposcopic examinations were performed by expert colposcopists

in a standard manner. However, our study had some limitations. Because of the retrospective nature of the study, some data which might be associated with high grade endocervical dysplasia were not complete. These data included the location of lesion under the colposcopic examination and colposcopic impression. ECC was only performed in selected cases, therefore, selection bias was unavoidable.

In conclusion, the frequency of high grade CIN in endocervical canal of women with ASC-US and LSIL cytology was low. Therefore, the routine ECC performance in those women is debatable. High grade ectocervical dysplasia and LSIL cytologic smears may be used as the predictors for high grade dysplasia in endocervical canal and doing ECC in these patients may be reasonable.

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