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Original Study

Follow-up Compliance of Adolescents with Cervical Dysplasia in an Inner-city Population

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Abstract. *Study Objective:* Adolescent compliance with cytologic and histologic cervical abnormalities is poor. Recent changes in abnormal cytology follow-up and colposcopy indications in young women may delay the diagnosis of cervical dysplasia. The objective of our study was to determine the compliance with follow up. We also wanted to summarize regression or progression of disease, and to determine if the new guidelines could affect severity and time of diagnosis.

Design: Retrospective review of medical records from adolescent patients (defined as women aged 12 to 21) who had a colposcopy between January 2004 and December 2006. Patients were excluded if they were 22 or older or if they had a previously abnormal cytologic evaluation.

Main Outcome Measures: Colposcopy records between January 2004 and December 2006 were identified by CPT code from a computerized database. Cytology and histology results, follow-up compliance rates, and demographic data were collected. Data were analyzed with a power $> 85\%$ and a P value $\leq .05$ for significance.

Results: Of the 210 records reviewed, 61.9% had atypical squamous cells of undetermined significance high-risk HPV, 33.7% had low-grade squamous intraepithelial lesion, and 4.5% had high-grade squamous intraepithelial lesions. Colposcopy was performed in 55.9%, and 15.2% required surgical intervention. Loop electrosurgical excision procedure (LEEP) was used in 87.5% of patients, and 12.5% had a cold knife cone. Mean time to follow in patients with a surgical intervention was 12.72 months and 11.02 months for those without ($P = .371$).

Conclusion: There appears to be no difference in compliance with follow-up, regardless of severity of disease or surgical intervention. There was no significant progression of disease and a high regression rate of abnormalities. This information supports the current American College of Obstetricians and Gynecologists and American Society for Colposcopy and Cervical Pathology guidelines to delay aggressive intervention in adolescents.

Key Words. Adolescents—Pap smear—Compliance—Cervical dysplasia

Introduction

Cervical dysplasia is a premalignant change in the cervical epithelium that may progress to cervical cancer. Human papillomavirus (HPV) is the greatest risk factor for cervical dysplasia and is the most common sexually transmitted infection in the United States.[1] Risk factors for cervical dysplasia, which have been identified, include smoking, young age of first intercourse, large number of sexual partners, infrequent use of barrier methods, and susceptibility of the adolescent cervix to the acquisition of the HPV virus.[2] The consensus conference sponsored by the American Society of Colposcopy and Cervical Pathology (ASCCP) in 2006 established management guidelines, which differ from previous years, for adolescent women with cervical cytologic and histologic abnormalities.[3] Previously, adolescents with cervical cytology consistent with atypical squamous cells of undetermined significance (ASCUS), in which the HPV test was positive, and low-grade squamous intraepithelial lesion (LGSIL) underwent colposcopy. Under new guidelines those patients with ASCUS or LGSIL may undergo cytology testing at twelve months, without affecting the severity of disease as most low grade disease will spontaneously resolve. No need for invasive testing is necessary in this population unless it persists beyond two years (3).

Since adolescent compliance with follow-up has been reported in the literature to be poor, the authors

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were concerned that this change may delay the diagnosis of moderate or severe cervical dysplasia, as well as the appropriate follow up of adolescents with cervical cytologic abnormalities. The estimated rate of non-compliance with follow-up appointments ranges from 26-50% over one to two years[4,5]. This non-compliance has been associated with younger age, lower educational level, unmarried status and the lack of insight of adolescents into the disease process[6,7].

Objectives

The primary objective of this study was to determine the compliance with follow up in adolescent patients with cervical dysplasia as well as the risk of progression of disease in this population in order to determine if new guidelines could affect severity of disease or delay its diagnosis. Our secondary objective was to summarize outcomes of patients including incidence of dysplasia, associated risk factors for severity of disease and evaluate if the type of invasive procedure performed influenced compliance.

Materials and Methods

Adolescent patients (defined women age 12 to 21), who had a colposcopy between January 2004 and December 2006, were identified by CPT code from a computerized database after IRB approval at the Center for Women's Medicine from Lehigh Valley Hospital. Patients were excluded from this review if they had a previously abnormal pap with or without intervention. Referral for colposcopy was based on one of the following cytologies: ASCUS with high-risk (HR) HPV, LGSIL, or high-grade squamous intraepithelial lesion (HGSIL). A chart review was performed to identify demographic data, referral cytology, histology, and other associated risk factors such as smoking history, number of sexual partners, parity, gravity, race, contraceptive choice, and use of barrier contraception. Follow-up cytology results and time since initial biopsy were obtained from a Health Network Laboratory database.

Data were analyzed using SPSS, version 12.0 (SPSS, Inc., Chicago, IL). After a power calculation of 85%, parametric statistical tests (independent *t* test, analysis of variance (ANOVA), and Pearson correlation) were used to analyze data with known normal distribution and adequate sample size. Nonparametric tests (Mann-Whitney, Kruskal-Wallace, and chi-square) were used as appropriate. A P value $\leq .05$ was considered statistically significant.

Results

There were 210 patients included in this study. Ages ranged from 14 to 21, with a mean age of 18.74 ± 1.93. Demographic characteristics are included in Table 1.

Table 1. Demographic Characteristics of the Study Population (N = 210)

	Number of Patients (%)
Hispanic	122 (57.8%)
Black	16 (7.6%)
Caucasian	71 (33.6%)
Pregnant at time of diagnosis	52 (24.6%)
Lifetime sexual partners	
1	125 (59%)
>1	86 (41%)
Birth control	107 (51%)
Barrier method	44 (20.9%)
HIV negative	207 (98%)
positive	4 (2%)
History of STI	64 (30.3%)
Tobacco use	76 (36%)
Age of diagnosis (y) (mean ± SD)	18.74 ± 1.93
Gravity	1.11 ± 1.03
Parity	0.70 ± 0.80

Abbreviations: STI, sexually transmitted infection; HIV, human immunodeficiency virus.

Initial cytology results and patients requiring colposcopy and surgical intervention for Cervical intraepithelial neoplasia (CIN) 2 or higher are shown in Table 2. All patients had an endocervical curetting (ECC) at the time of their colposcopy and surgical excision.

One hundred thirty-two (62.9%) patients had at least 1 documented follow-up visit, with a mean time to follow-up from diagnosis of 11.44 ± 7.48 months. Mean time to follow-up for patients with a surgical intervention was 12.72 ± 8.9 months and 11.02 ± 7.08 months for those without a surgical intervention ($P = .371$). There was a significant ($P < .001$) positive correlation ($r = 0.310$) between time to follow-up and age, but no difference was seen based on pregnancy status, race, or surgical intervention (Fig. 1).

Table 2. Characteristics of Initial Cytology and Histology

Initial Cytology	n (%)
ASCUS HRHPV	125 (61.9)
LGSIL	68 (33.7)
HGSIL	9 (4.5)
Colposcopy	118 (55.9)
Required surgical intervention	32 (15.2)
LEEP	28 (87.5)
Cone biopsy	4 (12.5)
Final histology after surgery (%)	
CIN I	34.4
CIN II	37.5
CIN III	28.1
Negative endocervical curetting (%)	100

Abbreviations: ASCUS HR_HPV, atypical cells of undetermined significance with high-risk human papilloma virus; CIN, cervical intraepithelial neoplasia; LGSIL, low-grade squamous intraepithelial lesion; HGSIL, high-grade squamous intraepithelial lesion.