Original Study

Cervical Cancer Screening Rates in a Chart Review of Adolescent Patients at an Academic Institution before and after the Publication of the 2009 American College of Obstetricians and Gynecologists' Recommendations

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A B S T R A C T

Objective: Evaluation of compliance with ACOG guidelines against screening for cervical cancer in women before age 21; identification of factors associated with lack of compliance with guidelines.
Methods: A review of 799 charts of women age 14-21 seen for care at our institution in 2009-2010 to determine baseline cervical cytology rates, compliance with publication of 2009 ACOG guidelines recommending against testing in this age group. Clinical data was gathered to identify patient and physician characteristics associated with testing.
Results: The baseline rate of cervical cytology testing for women age 14-21 in our chart review (20%, 2009) dropped significantly (10.8%, 2010, $P < .005$) after publication of new guidelines. Among those patients tested, factors associated with higher screening rates included: patients seen by obstetrician/gynecologist (59% patients tested 2009/38% 2010), who were sexually active (83%/88%) and seen for routine care (68%/95%). Other associated factors: prior screening (61% all patients tested), hormonal contraceptives (58%), private insurance (72%). Patients with history of previous cervical intraepithelial neoplasia had cytology testing done at high rates (72%).
Conclusion: The rate of cervical cytology screening in women ages 14-21 was higher than expected given ACOG recommendations. There was a significant decrease in screening rates after publication of guidelines. Patient and physician characteristics were identified which were associated with an increased screening rate. There are no databases that track cervical cancer testing in this age group. This information can be utilized for physician and patient education in order to improve compliance.
Key Words: Adolescent preventive care, Compliance, Guidelines, Cervical cancer screening, Cervical dysplasia in adolescents

Introduction

In December 2009, the American College of Obstetricians and Gynecologists (ACOG) published a Practice Bulletin with recommendations that the initiation of cervical cytology cancer screening occur at age 21 and that testing for the presence of the Human Papilloma Virus (HPV) DNA should not be performed in women younger than 30 years of age.[1] Prior to publication of this bulletin, ACOG had recommended that cervical cytology screening should be started at age 21 *OR* 3 years after first intercourse, whichever came sooner.[1] The ACOG guidelines are in agreement with other governing bodies such as the United States Preventive Services Task Force, American Society for Colposcopy and Cervical pathology and the American Cancer Society (ACS).[2–4]

These new recommendations are based upon expert consensus regarding a large body of evidence. Due to the extremely low incidence of cervical cancer (0.1%) and the high incidence of a transient infection with HPV (50%-80%) in this age group, these tests are not appropriate for screening purposes.[1,2] Despite the publication of new recommendations for cervical cancer screening, it is important to determine whether physicians are complying with these guidelines and the reasons for noncompliance. The causes which influence physician compliance have been identified by Cabana et al and involve lack of knowledge or lack of agreement by the physician; there may be an "inertia of previous practice" as well as patient and environmental-related barriers.[5]

There are no recent national health resources databases such as CDC which report the cervical cytology rate for patients younger than 21. There are data from commercial insurance reports, though not for recent years nor specific for this age group.[6,7] The current body of literature contains reports regarding the number of abnormal cervical cytology screening and subsequent referrals but there is no currently known incidence of testing in this population.[8,9] Similarly, at our own institution, a report noted a total of 370 Pap tests performed in adolescent girls in 2010 after publication of the new guidelines, with a high rate of HPV co-testing (74%).[10] This report, however, did not test for incidence.

The primary aim of our study is to determine the incidence of cervical cancer screening in young women, ages 14-21 by physicians practicing in an academic medical center. Our secondary aims were to compare those screening rates to rates prior to publication of 2009 recommendation and to identify factors associated with

The authors indicate no conflicts of interest.

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1083-3188/$ - see front matter
http://dx.doi.org/10.1016/j.jpag.2014.08.013

physician non-compliance, including patient characteristics, clinical history and subspecialty difference in adaptation of the guidelines.

Methods

This is a single site retrospective cohort study investigating cervical cancer screening in young women, age 14 to 21. We compared Loyola physicians' cervical cancer screening practices before and after updated ACOG practice guidelines were released in December 2009. After obtaining institutional review board approval, consecutive women between the ages of 14 and 21 seeking outpatient care in obstetrics & gynecology, internal medicine, pediatrics, medicine-pediatrics, or family medicine at Loyola University Medical Center's outpatient facilities from January through June 2009 and January through June 2010 were identified through a medical center listserv. Utilizing the electronic medical record, we reviewed 399 consecutive charts of women age 14 to 21 between January and June 2009, and 400 consecutive charts between January and June 2010. We collected demographic information including body mass index, age, race/ethnicity and insurance history, and clinical data including medical and gynecologic history. We included factors that may influence a clinician's decision to perform cervical cancer screening such as previous abnormal screening test (Pap test), history of sexual activity, gravidity/parity, previous gynecologic surgery as well as other gynecologic diagnoses. We recorded whether cervical screening with Pap test and/or HPV testing was performed, the ICD-9 diagnosis code linked with the screening test order and the indication for the patient visit. Provider specific information was recorded, including gender and specialty or subspecialty. If the physicians were not board certified obstetrician-gynecologists, we utilized the institutional database of primary care physicians to determine whether the provider was self-identified as having "special interest in women's health."

All patient data was de-identified and entered into a SPSS Version 16 (Chicago, IL) database for analysis. Demographic and clinical data were compared between the 2 groups, 2009 and 2010, to ensure the groups were similar in baseline characteristics. Next, cervical screening practices were compared between the 2 groups. Histograms and scatterplots were created for each variable to determine if it was normally distributed. Mann-Whitney or Student t-tests were used to compare continuous variables, as appropriate. Chi-square test of association was used for nominal data. Univariate analysis was done to determine if there were differences in demographic, clinical, and specialty data between patients who were treated according to guidelines and those not treated according to guidelines for each group. For each group, any variables which were significant to the 0.10 level in univariate analysis were placed in a multivariate regression analysis to determine which variables were associated with inappropriate screening.

Results

Seven hundred ninety-nine charts were reviewed: 399 in 2009 and 400 in 2010. Of the total 799 participants, 124 (16%) received cervical cancer screening. Rates of cervical cancer screening decreased significantly from 2009 to 2010 (20% vs 10.8%; $P < .0005$). Approximately 3% of study participants underwent HPV testing, and this did not differ significantly from 2009 to 2010 (Table 1).

Demographic information for the study population is presented in Table 1. The majority of patients were Caucasian, covered by private insurance, and seen for a "routine" office visit by a primary care female physician. Approximately one-quarter of the cohort had a history of previous cervical cancer screening testing with a diagnosis of cervical dysplasia noted in only 4%. A majority was sexually active with almost half having documentation of contraception in the chart. Most of those patients were using hormonal contraceptives.

Table 2 includes demographic information for only the patients who received cervical cancer screening. Sixty-five percent of the patients in our chart review who were screened for cervical cancer and HPV were seen in 2009. The frequency of cervical screening in Caucasians increased from 2009 to 2010 (38% and 63% respectively).

Seventy-seven percent of all patients who underwent cervical screening were seen for routine care. Nearly all women (95%) who had screening performed in 2010 were seen for routine care and the most common diagnosis linked with the cytology order was "routine." In the group of 31 patients with a history of previous abnormal Pap test results in 2009, 22 of them (71%) were tested for cervical neoplasia; in 2010 the numbers were 3 and 75% respectively. Patients who had prior normal cervical cancer screening reported in the chart had a higher rate of testing performed subsequently although there was a significant drop noted between 2009 and 2010 (45% vs 23%, P-value = .001).

Table 1
Data for Patients Cervical Cytology Testing

Data for Patients Cervical Cytology Testing	Total n (%)	2009 n (/%)	2010 n (/%)	P-Value
BMI (mean ± SD)	24.2 ± 5.7	23.6 ± 4.6	24.6 ± 6.5	.790
Cervical cytology performed	124 (16)	81 (65)	43 (35)	<.0005
HPV testing performed	23 (3)	15 (65)	8 (35)	.137
Race/ethnicity				
Caucasian	58 (47)	31 (38)	27 (63)	.076
African-American	18 (14.5)	28 (35)	4 (9.3)	
Hispanic	37 (30)	14 (17)	9 (21)	
Other	11 (9)	8 (10)	3 (7)	
Type of insurance				
Private insurance	80 (72)	57 (70)	32 (74)	.884
Public insurance	26 (21)	18 (22)	8 (19)	
No insurance	9 (7)	6 (7)	3 (7)	
Reason for office visit				
Routine	96 (77)	55 (68)	38 (95)	.002
Gynecologic diagnosis	25 (20)	25 (28)	3 (3)	
Non-gynecologic diagnosis	3 (2)	1 (1)	2 (2)	
Diagnosis with cytology order				
Routine	107 (87)	68 (84)	39 (90.7)	.863
Evaluation of problem	17 (13)	13 (16)	4 (9.3)	
Prior cervical cytology screening	75 (61)	53 (65)	22 (51)	.088
History of cervical dysplasia	35 (20)	22 (27)	3 (7)	<.005
History of sexually activity	106 (91)	67 (83)	37 (88)	.432
Type of contraception				
Hormonal	72 (58)	49 (61)	23 (53)	<.0005
Condoms	20 (16)	9 (11)	11 (26)	
None	32 (26)	23 (28)	9 (21)	