Women's Triage and Management Preferences for Cervical Cytologic Reports Demonstrating Atypical Squamous Cells of Undetermined Significance and Low-grade Squamous Intraepithelial Lesions

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Objective: To determine women's triage test preferences for the evaluation and management of atypical squamous cells of undetermined significance (ASCUS) and low-grade squamous intraepithelial lesion (LSIL) Papanicolaou smear reports.

Design: A 35-item questionnaire.

Setting: Primary care clinic waiting rooms.

Participants: A convenience sample of 968 women.

Intervention: Women received standardized descriptions of the meaning of ASCUS and LSIL Papanicolaou smear classifications and uniform descriptions of the 4 triage tests: Papanicolaou smear, human papillomavirus DNA test, cervicography, and colposcopy.

Main Outcome Measures: Subjects' responses to questionnaire.

Results: More women (58.4%) preferred a repeat Papanicolaou smear for an ASCUS report than would choose human papillomavirus DNA testing (7.3%), cervicography (20.6%), or colposcopy (13.8%) ($P<.001$, χ^2). Alternatively, 51% of women wanted colposcopy to evaluate an LSIL report compared with the other 3 options ($P<.001$, χ^2). Test accuracy was the most important factor that influenced women's decisions for each test, compared with cost, discomfort, and other reasons ($P<.001$, χ^2). Positive predictors for women's selection of colposcopy to evaluate a Papanicolaou smear showing LSIL included older age ($P<.01$, logistic regression analysis), higher level of income ($P<.001$, χ^2), greater level of education ($P<.001$, logistic regression analysis), greater level of knowledge of colposcopy and Papanicolaou smears ($P<.001$, logistic regression analysis), family history of cervical cancer ($P<.01$, χ^2), and history of cervical dysplasia ($P=.02$, χ^2).

Conclusions: Most women preferred a repeat Papanicolaou smear to further evaluate an initial Papanicolaou smear demonstrating ASCUS and colposcopy to evaluate a report of LSIL. Women identified test accuracy as the most important reason for triage test selection. Multiple factors, primarily involving patient and family history of cervical neoplasia, level of education, income, age, and knowledge of tests, influence women's desire for specific triage tests. Because no optimal management of women with ASCUS and LSIL Papanicolaou smear reports has been determined, consideration of women's triage test preferences should complement overall patient care.

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VARIOUS TYPES of management approaches are available for women who receive cervical cytologic reports that indicate atypical squamous cells of undetermined significance (ASCUS) or low-grade squamous intraepithelial lesion (LSIL). To say that these options have generated controversy[1] and confusion is an understatement. A repeat of the same screening test at a later date appeals to many clinicians because most low-grade cervical disease regresses and very little disease progresses in severity.[2] Yet, repeated use of the same nondiagnostic screening test for triage purposes risks missing potentially serious sequelae. Several recently published studies support the use of human papillomavirus (HPV) DNA testing for women with Papanicolaou smears indicating ASCUS or LSIL to identify women with high-grade cervical intraepithelial neoplasia.[3,4] Other researchers have shown that a repeat Papanicolaou smear combined with an HPV test is not more advantageous than examination by colposcopy.[5] To make matters even more confusing, cervicography has also been shown to be an effective intermediate triage test for women with mildly abnormal cervical cytologic results.[6,7] However, a colposcopic examination and cervical biopsy, the criterion standard for comparative purposes, provide the definitive diagnosis to select appropriate management.

SUBJECTS AND METHODS

SUBJECTS

A convenience sample of women 16 years of age or older was recruited from the waiting rooms of the Family Practice Clinic and the Obstetrics and Gynecology Clinic, the Medical College of Georgia, and the Family Practice Clinic, Eisenhower Army Medical Center, Fort Gordon, Augusta, Ga.

INSTRUMENTATION

A study questionnaire was designed to determine women's preferences for medical triage and management of cervical cytologic examination results indicating ASCUS and LSIL. The questionnaire was divided into 2 sections. The first section consisted of 27 questions about demographic information; knowledge of Papanicolaou smears, HPV DNA testing, cervicography, and colposcopy; and previous experience with and impressions of these 4 procedures. The second part of the questionnaire determined subjects' management preferences to case scenarios of ASCUS and LSIL Papanicolaou smear reports.

The 4 options presented for Papanicolaou smear reports indicating ASCUS and LSIL—a repeat Papanicolaou smear, HPV DNA test, cervicography, and colposcopy—were selected based on currently recommended guidelines.[8] Subjects' most important reason for their management selection (cost, accuracy, or discomfort) was assessed.

The ASCUS case scenario explained that clinically, the Papanicolaou smear report may mean nothing wrong, an inflammatory response, infection, hormonal changes, premalignant lesions that could progress to cancer, and the chance of having a precancerous change of the cervix (5%-25%).[14] The LSIL case scenario explained that the Papanicolaou smear showed a mild precancerous condition, that 50% to 60% of cases revert to normal without treatment, but that 10% to 15% of cases could develop into more serious cervical disease or cancer (**Figure 1**).[14]

One-paragraph descriptions of a Papanicolaou smear, HPV testing, cervicography, and colposcopy constituted the preliminary patient education materials. The presentations were uniform in content. Information about a description of the test, pain or discomfort involved, reliability for detecting cervical disease, and cost were included (**Figure 2**).

STUDY DESIGN

All consecutive patients at each clinic waiting room were asked to participate in the study. Before participation, subjects read and signed an informed consent form approved by an institutional review board. A record and demographic data were kept of women who refused to participate. Subjects completed the first part of the questionnaire and then read the descriptions of the 4 tests used to evaluate Papanicolaou smear results indicating ASCUS or LSIL. Subjects thereafter read the case scenarios for ASCUS and LSIL Papanicolaou smear reports and answered questions about their preferred management options for these 2 cases. Subjects individually completed the questionnaire and returned it to the investigator. Assistance for questionnaire completion was provided, when necessary, by a single investigator (D.K.).

STATISTICAL ANALYSIS

Demographic characteristics of civilian vs military subjects were compared using χ^2 tests for categorical variables. Mean age was compared between the 2 groups by Student t test. Comparisons of the proportions of study subjects choosing each of the follow-up options were made using the χ^2 test. Distributions of the responses regarding reasons for selection of specific follow-up preferences were compared across the follow-up choices by χ^2 test.

Multiple logistic regression was used to provide a multivariable evaluation of the associations between responses to the survey and specific follow-up preferences. Each of the follow-up preferences for the ASCUS and LSIL scenarios was used as the outcome variable in a multiple logistic regression model with demographic variables, self-reported knowledge of the test procedures, and test history as potential predictor variables. A forward stepwise selection procedure was used to identify groups of variables that were most associated with each of the follow-up choices in this sample, controlling for levels of the other predictor variables in the model.

To clarify the quagmire of proper management of abnormal cervical cytologic results, a group of physicians, facilitated by the National Cancer Institute, published suggested interim guidelines in 1994.[8] The guidelines are considered interim, probably because of pending conclusive results of a National Cancer Institute–funded multisite ASCUS/LSIL Triage Study due to be completed in 2001. The detailed guidelines specify 4 triage options for ASCUS and LSIL cervical cytologic results: a repeat Papanicolaou smear, colposcopy, HPV testing, and cervicography.

Clinical guidelines may approach perfection in a static, homologous medical world. Yet, guidelines are always susceptible to narrowed recommendations that satisfy the needs of collective or average patients and not necessarily the unique person being treated at that moment.[9] Guidelines that are not outcome-based are also suspect[10] and challenged by intuition and years of clinical experience that contest academic dogma. When guidelines offer multiple equivalent options for a single problem, patient preference becomes helpful to tailor or individualize care.[11] The interim guidelines for management of abnormal cervical cytologic results[8] have stated our current knowledge well but suffer from some of these criticisms.

The reasonable response to abnormal Papanicolaou smear results should include informed clinician guidance and communications with the patient. Physician clinical decisions following reports of abnormal cervical cytology have been investigated.[12] But, other than informing the patient of abnormal results and simplistic "cookbook" triage, has anyone bothered to ask women what tests they would prefer to further evaluate their cervix?[13] The purpose of this study was to determine women's triage test preferences for the evaluation and man-

Subject No.:
Date:

Scenario 1

After having a routine Papanicolaou smear performed, you are informed that the results of the test are "atypical but of undetermined significance." On talking to your physician, you are informed that this could actually represent a number of conditions, including nothing wrong, an inflammatory response, an infection, hormonal changes, or premalignant lesions that could progress to cancer. There is a 5% to 25% chance you may have a precancerous change of the cervix. Considering the information you have about the available options, which one of the following tests would you choose to further evaluate what the abnormal Papanicolaou smear actually represents?

1. A repeat Papanicolaou smear [ ]
2. Human papillomavirus (HPV) testing [ ]
3. Cervicography [ ]
4. Colposcopy [ ]

Of the 4 procedures above, which other test would you choose as a second option?

Papanicolaou smear [ ] HPV testing [ ] Cervicography [ ] Colposcopy [ ]

What is the most important reason why you made your selection?

Cost [ ] Accuracy [ ] Discomfort [ ]
Other (please specify):

If your doctor suggested a different test, would you agree with your doctor's suggestion instead of your first choice?

Yes [ ] No [ ]

Scenario 2

Now assume you have an abnormal Papanicolaou smear on routine examination and you are informed that you have a "low-grade squamous intraepithelial lesion." On talking to your physician, he or she informs you that this represents a mild precancerous condition. Approximately 50% to 60% of these conditions revert to normal without any treatment, but approximately 10% to 15% develop into more serious cervical disease or possibly cancer. Considering the information you have about the available options, which one of the following tests would you choose to further evaluate what the abnormal Papanicolaou smear actually represents?

1. A repeat Papanicolaou smear [ ]
2. HPV testing [ ]
3. Cervicography [ ]
4. Colposcopy [ ]

Of the 4 procedures above, which other test would you choose as a second option?

Papanicolaou smear [ ] HPV testing [ ] Cervicography [ ] Colposcopy [ ]

What is the most important reason why you made your selection?

Cost [ ] Accuracy [ ] Discomfort [ ]
Other (please specify):

If your doctor suggested a different test, would you agree with your doctor's suggestion instead of your first choice?

Yes [ ] No [ ]

Figure 1. *Case scenarios.*

agement of ASCUS and LSIL cervical cytology results. Secondary purposes were to determine patients' reasons for their preferred triage test choice and patient characteristics that predict test selection.

RESULTS

A total of 975 women (509 civilian and 466 military) were asked to participate, and 968 completed the survey. Seven women (0.7%) refused to participate in the study. No significant demographic differences were seen between this cohort and the women who completed the survey. Statistically significant demographic differences were observed between the 2 groups of women (military and civilian) for age, race, income, education, Papanicolaou

Please read the descriptions of the following tests used to evaluate women with abnormal Papanicolaou smear results.

Papanicolaou smear (Pap smear)

The Papanicolaou smear is a procedure done during the pelvic examination by which the physician swabs cells from the surface of the cervix to test for possible cancer. The procedure is usually painless even though minor bleeding does occur sometimes. Any discomfort experienced is usually with the pelvic examination and not with the Papanicolaou smear test. The Papanicolaou smear detects cervical disease approximately 60% to 85% of the time when disease is actually present. The Papanicolaou smear establishes the correct diagnosis about 95% of the time. The Papanicolaou smear costs $15 to $25. The Papanicolaou smear is the routine preliminary test done for cervical cancer.

Human Papilloma Virus (HPV) screening

The HPV test detects genital presence of the HPV. Human papillomavirus plays a significant role in the development of genital warts and cervical cancer. Human papillomavirus testing is done much like a Papanicolaou smear: with a Q-tip. While it does not specifically establish the severity or presence of premalignant or malignant disease, it can predict whether cervical disease exists and, if present, whether it will progress. The HPV test detects cervical disease approximately 90% of the time when disease is actually present. Approximately 10% of women may have no visible cervical disease if the HPV test is positive. The HPV test costs approximately $100.

Cervicography

Cervicography is a procedure in which a photograph of the cervix is taken after vinegar is applied to the cervix. The photograph is visually examined by a specialist at another site to detect abnormalities on the surface of the cervix. The procedure is painless. Because the whole cervix is seen, cervicography detects disease 85% to 90% of the time when disease is actually present. Because some normal conditions can be mistaken for minor abnormalities, a correct diagnosis is obtained 85% to 90% of the time. The cervicography test costs $40.

Colposcopy

Colposcopy is a procedure to evaluate the cervix using a microscopelike device. Cervical disease seen by colposcopy may be sampled by biopsy. The biopsy procedure may be uncomfortable. This is the most common procedure done when a Papanicolaou smear indicates precancerous changes of the cervix and is the most accurate of these 4 tests. Colposcopy usually costs about $150 to $300 to perform.

Figure 2. *Information provided to patients about tests.*

smear frequency, history of abnormal Papanicolaou smear results, and family history of cervical cancer (**Table 1**). In addition, military-affiliated women (active duty, retired, spouses, and dependents) self-reported a greater knowledge of Papanicolaou smears, HPV DNA tests, cervicography, and colposcopy ($P<.001$).

Subjects' preferences for triage of Papanicolaou smear reports indicating ASCUS and LSIL were evaluated (**Table 2**). More women (58.4%) would want a repeat Papanicolaou smear done if the Papanicolaou smear indicated ASCUS than would choose HPV DNA (7.3%), cervicography (20.6%), or colposcopy (13.8%) ($P<.001$). Alternatively, 51% of women would want a colposcopic examination if they had a Papanicolaou smear reported as LSIL ($P<.001$) compared with the other 3 management options.

Univariate predictors for the choice of colposcopy for Papanicolaou smear results indicating ASCUS and LSIL are given in **Table 3**. History of abnormal Papanicolaou smear results or cervical dysplasia, Papanicolaou smear frequency, education, knowledge of colposcopy, family history of cervical dysplasia, and type of health care system (military or civilian) were found to be predictors for the selection of colposcopy for ASCUS and LSIL results on Papanicolaou smears.

Logistic regression modeling results of follow-up preferences for an ASCUS and LSIL Papanicolaou smear re-

port are given in **Table 4**. Older civilian women with more education and knowledge of colposcopy preferred colposcopy for a Papanicolaou smear reporting LSIL. Military women and women with less education preferred a repeat Papanicolaou smear for a Papanicolaou smear result.

An attempt was made to determine why women selected each triage test for the abnormal Papanicolaou smear reports (**Table 5**). Test accuracy was the primary reason women selected the triage tests for ASCUS and LSIL reports ($P<.001$). Test cost was the second most common reason for triage test selection, followed by test discomfort. The same order of importance was maintained for military and civilian women.

COMMENT

The controversy about the ideal triage or management tests for the evaluation of Papanicolaou smears indicating ASCUS and LSIL continues in medicine.[13,15] A lack of definitive data addressing this dilemma fuels the controversy and interjects confusion for the practicing clinician. It is hoped that the recently initiated National Cancer Institute ASCUS/LSIL Triage Study will provide the

Table 1. Demographics for Civilian and Military Subjects*

Variable	Civilian	Military	P
No. of subjects	509	466	<.03
Mean age, y	31.8	33.8	
Race			
Black	52.6	58.2	<.001
White	44.3	33.6	
Other	3.1	8.3	
Annual family income, $			
<10 000	19.7	5.7	<.001
10 000-25 000	51.6	40.4	
25 000-50 000	22.9	38.8	
>50 000	5.8	15.1	
Education			
<High school	15.4	7.2	<.001
High school	57.2	45.2	
College	24.8	40.6	
Postgraduate	2.6	7.0	
Papanicolaou smear frequency			
Twice per year	9.8	10.0	<.001
Once per year	55.0	76.0	
Every 3 y	23.9	10.0	
Never	11.4	3.9	
History			
Abnormal Papanicolaou smear result	25.7	33.3	.009
Cervical neoplasia	6.0	5.7	>.05
Cervical cancer (family)	22.2	12.1	<.001
Procedures†			
Human papillomavirus test	10.2	10.3	>.05
Cervicography	3.8	4.7	>.05
Colposcopy	14.3	17.6	>.05

*Values are given as percentages except where noted. Comparison of mean ages was performed using Student t test; comparisons of distributions of categorical variables between groups were performed using χ^2 test.
†Reported as mean of Likert scale knowledge (1=a lot, 2=some, 3=a little, 4=nothing).

Table 3. Univariate Predictors for Choice of Colposcopy*

Characteristic	Colposcopy for ASCUS %	Colposcopy for ASCUS P	Colposcopy for LSIL %	Colposcopy for LSIL P
Health care system				
Military	17.8	<.001	38.6	<.001
Civilian	10.2		60.9	
Papanicolaou smear history				
Abnormal results	19.7	<.001	53.4	>.05
No abnormal results	10.9		50.3	
Papanicolaou smear frequency				
2 per year	16.5	.04	62.9	<.001
Every 3 y	7.5		47.1	
History of cervical dysplasia				
Yes	37.0	<.001	71.7	.02
No	12.1		50.0	
Knowledge				
Papanicolaou smears				
Little	10.3	.02	46.2	<.001
More	15.0		53.3	
Colposcopy				
None	9.5	<.001	45.1	<.001
More	17.9		58.5	
Education				
Not high school graduate	8.8	>.05	38.0	<.001
Postcollege experience	21.4		63.4	
Family history of cervical cancer				
Yes	47.8	<.01	60.5	<.01
No	61.4		49.0	
Income				
<$25 000/y	11.4	<.05	48.3	<.001
≥$25 000/y	16.8		55.6	

*Abbreviations are given in the footnote to Table 2.

Table 2. Preferences of 879 Subjects for Triage of Papanicolaou Smear Results*

Papanicolaou Smear Result	Preference Order	Preference, % Repeated Papanicolaou Smear	HPV DNA	Cervicography	Colposcopy	χ^2
ASCUS	First	58.4	7.3	20.6	13.8	552.93
	Second	13.4	24.3	39.7	22.6	123.68
LSIL	First	14.2	7.6	27.2	51.0	385.80
	Second	8.0	25.8	42.6	23.6	208.54

*HPV indicates human papillomavirus; ASCUS, atypical squamous cells of undetermined significance; LSIL, low-grade squamous intraepithelial lesion. $P<.001$ for each variable.

Table 4. Independent Patient Predictors for Triage Test Selection*

Papanicolaou Smear Result	Repeated Papanicolaou Smear	P	HPV DNA Test	P	Cervicography	P	Colposcopy	P
ASCUS	Civilian health care	<.05	No history of abnormal Papanicolaou smear	<.05	Civilian health care	<.01	Military health care	<.01
	No family history of cervical cancer	<.01			Family history of cervical cancer	<.05	Previous HPV test	<.05
	No previous colposcopy	<.01			Papanicolaou smear knowledge	<.001	Previous colposcopy	<.001
LSIL	Military health care	<.01	Military health care	<.001	Civilian health care	<.001	Civilian health care	<.001
	Not high school graduate	<.01			Younger age	<.05	Older age	<.01
					Income <$25 000/y	<.05	More education	<.001
					Less frequent Papanicolaou smear	<.01	Colposcopy knowledge	<.01
							Previous HPV test	<.05

*Abbreviations are given in the footnote to Table 2.

Table 5. Subjects' Reason for Selection of Each Test to Evaluate Papanicolaou Smear Result*

Reason	Triage Test, %				χ^2	P
	Repeated Papanicolaou Smear	HPV Test	Cervicography	Colposcopy		
			ASCUS			
Cost	35.6	6.3	16.2	9.1	104.66	<.001
Accuracy	49.3	88.9	68.7	86.8		
Discomfort	8.2	3.2	12.8	1.7		
Other	6.8	1.6	2.2	2.5		
			LSIL			
Cost	19.3	9.0	16.6	5.7	85.26	<.001
Accuracy	66.7	85.1	77.6	92.8		
Discomfort	3.5	4.5	4.1	0.9		
Other	10.5	1.5	1.7	0.3		

*Abbreviations are given in the footnote to Table 2.

needed medical guidance early next century. In the meantime, we are "protected and granted" to use various triage tests according to interim guidelines.[8] If, with our current limited understanding, one triage test seems no more effective than another, why not allow women to play an active role in clinical decision making that directly affects their health and lives?

Our study shows that women have varied but distinctly different preferences for the management of Papanicolaou smears reporting ASCUS and LSIL. Women preferred a repeat Papanicolaou smear for an ASCUS report. Cervicography was the next most desired triage test. The Papanicolaou smear indicating LSIL was perceived differently by women, so most women wanted colposcopy for a report of LSIL. Again, cervicography was the next most popular triage test selection. Few women preferred HPV DNA testing for either Papanicolaou smear report.

Women considered the accuracy of the triage test to be the most important reason for test selection. This is the same reason most clinicians use to determine triage decisions. Test cost and discomfort were less important factors that influenced women's decisions. Even in the group of military women, in which cost of medicine is not a major concern and was essentially controlled for, the responses were similar. Women's desire for the best medicine, regardless of cost, may conflict with financially driven goals of managed health care. The restriction of patient choice, especially when outcome data are unavailable, may create bitterness toward managed care administrators and the involved clinician. Triage test options perceived as unsuitable or "not best for me" could adversely affect patient compliance and clinician-patient rapport.

Certain patient characteristics seemed to influence the selection of triage tests. Type of health care system, history of an abnormal Papanicolaou smear result, frequency of routine Papanicolaou smears, history of premalignant cervical disease, knowledge about Papanicolaou smears and colposcopy, level of education, and family history of cervical cancer all influenced test selection. Clinicians may want to consider these factors when determining or tailoring triage options. In general, conscious or unconscious perceived risk factors for cervical cancer swayed preferences. Patient experiences have been shown to influence patient preferences.[16] Although potential physical concerns must be considered, psychological issues should not be overlooked when determining management.

Several potential limitations of this study should be acknowledged. First, women's triage decisions, not unlike ours, were based on limited factual information. Their initial self-reported knowledge about each test was marginal, and they received limited education about the 4 triage tests. Furthermore, these findings reflect the desire of women who for the most part had no experience with these tests. Finally, although factual and standardized, more or less information (positive or negative)[17] about each test and the method of information presentation[18] may have altered the final results.

Regardless of the interim guidelines, many clinicians probably do not offer their patients options for further follow-up of cytologic reports indicating ASCUS and LSIL. A lack of awareness of these guidelines may be one explanation. Simplistic, narrowed triage approaches are also enticing for busy clinicians. However, it may be important to consider patient test preferences when our limited data concerning these tests do not define the best test option. Certain patient characteristics, including age, education, test knowledge, and history are predictive of women's preferences for the evaluation of Papanicolaou smear reports of ASCUS and LSIL. Knowledge of these predictors may be important to consider when counseling women about triage test options. It is important for clinicians to know that otherwise, most women preferred a repeat Papanicolaou smear for a report of ASCUS and colposcopy for a report of LSIL. Women were willing to accept a small risk of not detecting cervical neoplasia if they had a minor cytologic abnormality and, yet, preferred a more accurate triage test for a report of LSIL. Understanding which women prefer certain tests and tailoring approaches accordingly may reduce the high noncompliance rates associated with the follow-up of women with abnormal Papanicolaou smear reports.[19]

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Editor's Note: This article is about the potential results of using written informed consent for women with Papanicolaou smear results showing atypical squamous cells of undetermined significance and low-grade squamous intraepithelial lesions. It is hoped that all women are informed of their options if their Papanicolaou smears are abnormal. This must be tempered by lack of availability of cervicography, human papillomavirus DNA testing, or both, at many family physician offices.

The content of the information provided to the patient is important. For example, the statement on colposcopy (Figure 2) says it is the "most common procedure done when a Papanicolaou smear indicates precancerous changes of the cervix." With this definition, it is not a surprise that many women chose colposcopy for low-grade squamous intraepithelial lesions when the physician described the condition as "a mild precancerous condition." This despite the fact that the rate of developing more serious cervical disease or possibly cancer is listed as 10% to 15% for low-grade squamous intraepithelial lesions and 5% to 25% for atypical squamous cells of undetermined significance.

I agree with the authors that we as physicians are unsure of the next best test given the limited state of our current knowledge. In these situations, it is all the more important to ask patients for their individual preferences.

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