
Follow-up of Abnormal Papanicolaou Smears Among Women of Different Races

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Background. Current information about racial differences in the rate of cervical abnormalities is incomplete, and there are few data about racial differences in compliance with follow-up and treatment. The purpose of this study was to investigate the frequency and follow-up of abnormal Pap smear findings in white, black, and Southeast Asian women.

Methods. The charts of women who attended a St Paul family practice residency clinic and who had abnormal Papanicolaou (Pap) smear results between January 1, 1989, and September 1, 1992, were reviewed, and information about age, race, insurance, Pap smear findings, diagnostic studies, and treatment procedures was recorded.

Results. Of 1794 women who had Pap smears during this period, 190 (10.6%) had abnormal results, with a diagnosis of atypia, dysplasia, or carcinoma. The rate of

abnormality was greater for black women (16.4%) than for Southeast Asian (6.1%) and white women (11.6%); however, the proportion of abnormal Pap smears that showed moderately severe or worse changes was greater for Southeast Asians than for whites (30.6% vs 14.3%, $P < .05$). Southeast Asian women with abnormal Pap smears were also less likely than whites and blacks to follow through with recommended diagnostic and treatment procedures.

Conclusions. Southeast Asian women in this study were less likely than white and black women to comply with recommended follow-up diagnostic and treatment procedures for cervical disease.

Key words. Cervix dysplasia; cervix neoplasms; health behavior; demography; health services accessibility; race. (*J Fam Pract* 1993; 37:583-587)

The Papanicolaou (Pap) smear has been widely used as a screening test for cervical carcinoma, which is an important cause of morbidity and mortality among women around the world. In the United States alone, it was estimated that there would be 13,500 new cases and 4400 deaths from cervical cancer in 1992.¹ Incidence rates for invasive cervical cancer in this country vary by certain patient characteristics. For example, invasive cervical carcinoma has been found to be nearly twice as common in blacks as in whites, with age-adjusted rates of 14.8/100,000 and 7.8/100,000, respectively.¹ There are also significant differences in the prevalence of this prob-

lem between countries: invasive cervical cancer is seen in 8.6/100,000 women in the United States,¹ and in 17.4/100,000 women in Singapore.² In fact, it is the most common malignant neoplasm among women in Thailand, and was found by one investigator to constitute 25.8% of all malignancies among women there.³ Whether cervical carcinoma is as prevalent among Southeast Asians who have immigrated to the United States is unknown.

The causes for these racial differences in cervical cancer-related mortality are not entirely known; however, several factors may be involved. Some investigators believe that promiscuous male sexual behavior may be at least partially responsible for the higher rates of cervical carcinoma in Asian women.⁴ Problems with access to health care may also contribute to higher mortality rates from cervical cancer in underserved or minority groups of women.⁵ Moreover, it is likely that for many women

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lem between countries: invasive cervical cancer is seen in 8.6/100,000 women in the United States,¹ and in 17.4/100,000 women in Singapore.² In fact, it is the most common malignant neoplasm among women in Thailand, and was found by one investigator to constitute 25.8% of all malignancies among women there.³ Whether cervical carcinoma is as prevalent among Southeast Asians who have immigrated to the United States is unknown.

The causes for these racial differences in cervical cancer-related mortality are not entirely known; however, several factors may be involved. Some investigators believe that promiscuous male sexual behavior may be at least partially responsible for the higher rates of cervical carcinoma in Asian women.⁴ Problems with access to health care may also contribute to higher mortality rates from cervical cancer in underserved or minority groups of women.⁵ Moreover, it is likely that for many women

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the problem is not only that of their risk for contracting the disease or of their difficulty in accessing health care, but also of inconsistent follow-up.

Certainly, careful follow-up of cervical abnormalities is critical to our ability to control the progression of cervical disease; however, follow-up is often inadequate. Many women do not yet understand the importance of having regular Pap smears and reserve their examinations for occasions when they are having symptoms, which in the case of cervical carcinoma may be too late. Others avoid scheduling pelvic examinations because they are uncomfortable or embarrassing. For some women, the problem is communication: this may occur at a very basic level, where the patient and health care provider do not speak the same language, or at a higher level, where the patient does not comprehend the potential consequences of an abnormal result. Worse yet, some patients never hear about their abnormal findings. There are also socioeconomic and cultural reasons for inadequate follow-up: those who lack health insurance, help with child care, or transportation might be less likely to receive adequate follow-up and treatment than those who have these resources. Finally, certain groups may hesitate to receive treatment because of their cultural views about technological or "invasive" treatment. Although we have observed Southeast Asians to be resistant toward certain medical procedures, the impact of this behavior on abnormal Pap smear follow-up and treatment has not been reported.

The purpose of this study was to investigate the frequency of abnormal Pap smears and the follow-up procedures and treatment received by Southeast Asian, black, and white women who were seen at a family practice residency clinic.

Methods

A retrospective descriptive study was conducted of women who were found to have abnormal Pap smears and of their treatment and follow-up at a family practice residency clinic in St Paul, Minnesota, from January 1, 1989, through September 1, 1992. This residency clinic is located near downtown St Paul, and serves a lower to middle socioeconomic group of patients, consisting of a variety of racial groups, including whites, Southeast Asians, blacks, Hispanics, and Native Americans. During this period, the 24 or 25 residents in the training program, together with 3 full-time faculty, performed a total of 1794 Pap smears, which included both screening examinations and follow-up examinations for previously abnormal results. Pap smears were obtained using the

Cytobrush and wooden spatula. The 190 women with abnormal results were contacted by their physician (or, for non-English-speaking patients, by an interpreter), and follow-up plans were discussed. A registered nurse logged the names of women with abnormal results, along with their prescribed course of follow-up, into a Pap smear follow-up file. This was reviewed by the nurse on a monthly basis to assess patient compliance with recommended procedures; patients who did not appear to be compliant were contacted by telephone (preferred) or by mail, several times if necessary. Women with abnormal Pap smears who neglected or refused to follow through with recommended colposcopy and other diagnostic or treatment procedures were sent certified letters to remind them of the need for follow-up. When failure to follow up with the clinic occurred because the patient transferred to another provider, this was noted in the chart. Recommended follow-up diagnostic procedures included repeat Pap smears and colposcopy, and recommended treatment procedures included cryotherapy, cervical conization (with laser or loop excision), laser ablation, hysterectomy, and radiation therapy. Of these procedures, only cryotherapy was offered at the clinic.

The names of the 190 women with abnormal Pap smears in the patient population for this study were taken from the monthly lists of women with abnormal results prepared by the laboratory that services the clinic. This laboratory employs six registered cytotechnologists to screen approximately 40,000 Pap smears annually. In addition, seven pathologists review 10% of all Pap smear slides, as well as all abnormal and difficult-to-interpret slides. The quality assurance program used by this laboratory for Pap smear interpretation is approved by the College of American Pathologists and by the Joint Commission for Hospital Accreditation.

During the period of study, two reporting systems were used to describe Pap smear results: the Papanicolaou Class and the Bethesda System. Each report was accompanied by more generic descriptors, such as "inflammatory atypia," "mild," "moderate," or "severe dysplasia," "carcinoma in situ," or "invasive carcinoma." Thus, for consistency, we have used these more generic descriptions. For purposes of comparison, atypia, including inflammatory atypia, reparative atypia, and atypia of undetermined significance, were categorized class II; mild dysplasia, low-grade SIL (squamous intraepithelial lesion), as class II; moderate to severe dysplasia, high-grade SIL, as class III; carcinoma in situ, high-grade SIL, as class IV; and invasive carcinoma as class V.

The charts of all women with abnormal Pap smears from January 1, 1989, to September 1, 1992, were reviewed by the first author. Pap smear findings, second-

Table 1. Outcomes of Abnormal Pap Smears, by Racial Group

| Pap Smear Description | White (n = 848) | Southeast Asian (n = 593) | Black (n = 280) | Other (n = 73) | Total (N = 1794) |
|--|--------------------|------------------------------|--------------------|-------------------|---------------------|
| Atypia, n | 33 | 16 | 15 | 4 | 68 |
| Mild dysplasia, n | 51 | 9 | 20 | 4 | 84 |
| Moderate-severe dysplasia, n | 13 | 7 | 11 | 2 | 33 |
| Carcinoma in situ, n | 1 | 3 | 0 | 0 | 4 |
| Invasive carcinoma, n | 0 | 1 | 0 | 0 | 1 |
| Total* abnormal results, n (%) | 98 (11.6) | 36 (6.1) | 46 (16.4) | 10 (13.7) | 190 (10.6) |
| Women with dysplasia or carcinoma in situ, % | 7.7 | 3.2 | 11.1 | 8.2 | 6.7 |
| Abnormal results with \geq moderately severe† disease, % | 14.3 | 30.6 | 23.9 | 20.0 | 20.0 |

*The rate of abnormality differed significantly between whites and Southeast Asians ($P < .01$), whites and blacks ($P < .05$), and Southeast Asians and blacks ($P < .01$).

†" \geq Moderately severe" includes moderate to severe dysplasia, carcinoma in situ, and invasive carcinoma. Differences in proportions of women with moderate to severe dysplasia were significant between whites and Southeast Asians ($P < .05$), but not significant between blacks and whites or blacks and Southeast Asians.

ary diagnostic procedures, treatment, problems with compliance, and age, race, and insurance type were recorded for each patient. These data were then reviewed for accuracy by the second author and the clinic Pap smear coordinator. For purposes of this study, an abnormal Pap smear was defined as a Pap smear showing atypia, dysplasia, or carcinoma.

Results

Demographics

Over the 45-month study period, a total of 1803 Pap smears were performed, 199 of which were abnormal. Nine women with abnormal results were excluded from the study because follow-up was still in process at the time of data analysis. Of the remaining 1794 women who had had Pap smears during this period, 848 were white, 593 were Southeast Asian, 280 were black, and 73 were either from other ethnic groups (mostly Hispanics and Native Americans), or did not have a racial designation (1 patient). The subgroup of 190 women with abnormal results, 10.6% of the larger sample, showed the following characteristics: their mean age was 29.7 years ($SD \pm 11.9$); 63.2% were in the Medical Assistance program; and 51.6% were white, 18.9% Southeast Asian, 24.2% black, and 5.3% belonged to other racial groups or their race was not indicated in their chart.

Abnormal Pap smear outcomes by racial group are shown in Table 1. Overall, 10.6% of Pap smears were abnormal, ranging from 6.1% abnormal results for Southeast Asians to 11.6% for whites and 16.4% for

blacks. The rate of abnormality was significantly higher for black women than for Southeast Asians and whites ($P < .01$ and $.05$, respectively), and higher for whites than for Southeast Asians ($P < .01$). The proportion of patients with abnormal Pap smears that showed a moderate to severe degree of abnormality or worse was greater for Southeast Asians (30.6%) than for whites (14.3%; $P < .05$).

Follow-up diagnostic studies performed for women with abnormal Pap smears by racial group are shown in Table 2. The failed follow-up rate for secondary diagnostic studies was five times greater for Southeast Asians than whites ($P < .001$), and more than twice as great for Southeast Asians than for blacks ($P < .05$). There was also a trend (not significant) for blacks to fail follow-up studies more frequently than whites.

Treatments performed for abnormal Pap smears by racial group are shown in Table 3. Here too, the failed treatment rate was five times higher for Southeast Asians than whites ($P < .001$), and more than twice as high for Southeast Asians than for blacks ($P < .01$). Of the 39 women who did not return for treatment, 6 had moderate to severe dysplasia or carcinoma in situ: 2 were black and 4 were Southeast Asian.

In general, higher grades of cervical abnormality were associated with more aggressive forms of therapy and greater patient compliance. The one patient whose Pap smear showed mild dysplasia and who underwent hysterectomy was found to have carcinoma in situ that was detected by biopsy specimens taken at colposcopy. These findings, together with her cervical stenosis (which would make future examinations difficult) and hyperandrogenism, prompted the recommendation for hysterectomy.

Table 2. Follow-up of Abnormal Pap Smears with Secondary Diagnostic Studies, by Racial Group

| Follow-up Diagnostic Procedure | White (n = 98) | Southeast Asian (n = 36) | Black (n = 46) | Other (n = 10) | Total (n = 190) |
|---|-------------------|-----------------------------|-------------------|-------------------|--------------------|
| Repeat Pap, n | 30 | 6 | 7 | 3 | 46 |
| Colposcopy, n | 57 | 16 | 30 | 6 | 109 |
| Transferred care, n | 4 | 1 | 2 | 0 | 7 |
| Lost, moved, or did not return for appointment, n | 7 | 5 | 7 | 1 | 20 |
| Refused studies, n | 0 | 8 | 0 | 0 | 8 |
| Presumed failed* follow-up, n (%) | 7 (7.1) | 13 (36.1) | 7 (15.2) | 1 (10.0) | 28 (14.7) |

*The presumed failed follow-up category includes "lost, moved, or did not return" and "refused studies" categories. The failed follow-up rate differed significantly between whites and Southeast Asians ($P < .001$), and Southeast Asians and blacks ($P < .05$). Differences between whites and blacks were not significant.

Discussion

Our results showed that, for this population of women, the overall rate of abnormal Pap smears was 10.6%, and the proportion of Pap smears showing dysplasia or carcinoma in situ was 6.7%, which is slightly higher than the 4.2% prevalence of cervical intraepithelial neoplasia (a diagnosis which includes dysplasia and carcinoma in situ) in a 1988 sample of over 200,000 Australian women.⁶

In our diverse population of women, there were racial differences both in the prevalence of abnormal Pap smears and in follow-up diagnostic and treatment procedures. The finding of a higher rate of abnormal Pap smears in blacks compared with whites might be expected, given the higher rate of invasive cervical carcinoma among black women, as discussed earlier. In contrast to previous reports of higher rates of cervical carcinoma in some parts of Southeast Asia, Southeast Asian women in this study showed a lower frequency of Pap smear abnormalities than both black and white women; however, they had a greater proportion of moderate to severe abnormalities than did whites. The more severe abnormalities seen among Southeast Asian women may have been at least partially due to their tendency to

refuse follow-up diagnostic and treatment procedures, which in turn may have been caused by such factors as their fear of prolonged morbidity after surgical procedures, concerns about future fertility following gynecologic procedures, or lack of concern about asymptomatic conditions. The more advanced disease seen in Southeast Asian women may also have been influenced by confounding variables, such as socioeconomic status, insurance, or certain cultural factors. The interaction of such variables with race, as it relates to Pap smear outcomes, was not studied here and should be investigated in future studies with larger populations.

Although our failed follow-up rates were not small, 14.7% and 20.5% for diagnostic and treatment follow-up, respectively, neither were they as high as those cited by other investigators: from 20% to more than 40%.⁷⁻¹⁰ Failure to follow up after abnormal Pap smears is a serious problem, since delays in treatment appear to increase one's risk of developing invasive cervical carcinoma, as seen in studies documenting the progression of cervical disease over time.¹¹ Recognizing the potentially grave consequences of inadequate follow-up, physicians are investigating methods for improving compliance with follow-up for abnormal Pap smears. One group, for

Table 3. Treatment of Women with Abnormal Pap Smears, by Racial Group

| Treatment Procedures | White (n = 98) | Southeast Asian (n = 36) | Black (n = 46) | Other (n = 10) | Total (n = 190) |
|---|-------------------|-----------------------------|-------------------|-------------------|--------------------|
| No procedural treatment indicated, n | 51 | 10 | 13 | 5 | 79 |
| Cryotherapy, n | 12 | 0 | 5 | 2 | 19 |
| Cone or laser ablation, n | 18 | 4 | 12 | 2 | 36 |
| Hysterectomy or radiation, n | 1 | 2 | 2 | 0 | 5 |
| Transferred care, n | 6 | 2 | 4 | 0 | 12 |
| Lost, moved, or did not return for appointment, n | 9 | 6 | 10 | 1 | 26 |
| Refused treatment, n | 1 | 12 | 0 | 0 | 13 |
| Presumed failed* treatment, n (%) | 10 (10.2) | 18 (50.0) | 10 (21.7) | 1 (10.0) | 39 (20.5) |

*The presumed failed treatment category includes "lost, moved, or did not return" and "refused treatment" categories. The failed treatment rate differed significantly between whites and Southeast Asians ($P < .001$), and between Southeast Asians and blacks ($P < .01$).

example, found that follow-up compliance tended to be greater when an informational pamphlet was added to the notification letter (64% vs 51%, $P = .10$).⁹ Another team recently developed a Pap smear quality assurance program, where criteria were established to deal appropriately with abnormal Pap smears, and feedback on compliance with these criteria was provided on a monthly basis. The criteria included the presence of a cytology report in the chart, a note in the chart that the patient was informed of the result, and documentation of follow-up. With this system, Pap smear and follow-up results appeared in the medical record of 94% of patients with abnormal findings.¹² These findings do not tell us how patients complied with recommended follow-up; however, documentation of patient notification of abnormal results is a critical step in assuring follow-up.

Even with consistent documentation of abnormal Pap smear results, certain culturally based perspectives will likely continue to influence patients' willingness to accept recommended medical procedures. However, it is important that patients who refuse to follow through with recommended procedures are carefully informed of the potential risks of nontreatment, and that this communication is documented in their clinical record. It is also possible that with clear communication and education, resistance to such procedures may gradually dissipate.

Conclusions

Cervical abnormalities are a growing problem and, when left untreated, may result in fatal disease. Unfortunately, significant numbers of women do not receive adequate treatment because of their failure to follow up with recommended diagnostic and treatment procedures. This

study found important racial differences in both the rate and severity of Pap smear abnormalities, as well as in patient compliance with follow-up. If these results are confirmed in other studies, they will help identify high-risk groups that require greater surveillance by health care professionals.

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