

Ovarian Carcinoma Diagnosis

Results of a National Ovarian Cancer Survey

Barbara A. Goff, M.D.¹

Lynn Mandel, Ph.D.¹

Howard G. Muntz, M.D.²

Cindy H. Melancon, R.N., M.N.³

¹ University of Washington, Department of Obstetrics and Gynecology, Seattle, Washington.

² Virginia Mason Medical Center, Seattle, Washington.

³ *CONVERSATIONS!*, Amarillo, Texas.

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Address for reprints: Barbara A. Goff, M.D., University of Washington, Department of Obstetrics and Gynecology, Box 356460, Seattle, Washington 98195-6460.

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BACKGROUND. Ovarian carcinoma often is called the “silent killer” because the disease usually is not detected until an advanced stage. The authors’ goal was to evaluate preoperative symptoms and factors that may contribute to delayed diagnosis for women with ovarian carcinoma.

METHODS. A two-page survey was distributed to 1500 women who subscribe to *CONVERSATIONS!*, a newsletter about ovarian carcinoma. Because the survey could be copied and given to other patients, 1725 surveys were returned from women in 46 states and 4 Canadian provinces.

RESULTS. The median age of the surveyed women was 52 years, and 70% had Stage III or IV disease (International Federation of Gynecology and Obstetrics). When asked about symptoms before the diagnosis of ovarian carcinoma, 95% reported symptoms, which were categorized as abdominal (77%), gastrointestinal (70%), pain (58%), constitutional (50%), urinary (34%), and pelvic (26%). Only 11% of women with Stage I/II and 3% with Stage III/IV reported no symptoms before their diagnosis. Women who ignored their symptoms were significantly more likely to be diagnosed with advanced disease compared with those who did not ($P = 0.002$). The time required for a health care provider to make the diagnosis was reported as less than 3 months by 55%, but greater than 6 months by 26% and greater than 1 year by 11%. Factors significantly associated with delay in diagnosis were omission of a pelvic exam at first visit; having a multitude of symptoms; being diagnosed initially with no problem, depression, stress, irritable bowel, or gastritis; not initially receiving an ultrasound, computed tomography, or CA 125 test; and younger age. The type of health care provider seen initially, insurance, and specific symptoms did not correlate with delayed diagnosis.

CONCLUSIONS. This large national survey confirms that the majority of women with ovarian carcinoma are symptomatic and frequently have delays in diagnosis. *Cancer* 2000;89:2068–75. © 2000 American Cancer Society.

KEYWORDS: ovarian carcinoma, symptoms, diagnosis, survey.

Ovarian carcinoma often is called the “silent killer” because symptoms do not develop until advanced stages when chance of cure is poor. Textbooks in internal medicine,^{1,2} family practice,³ and obstetrics and gynecology⁴ perpetuate the idea that ovarian carcinoma is asymptomatic until late in the course of disease progression. However, several small retrospective studies,^{5–8} which have relied on chart review, suggest that most women diagnosed with ovarian carcinoma do report symptoms, and these usually are not gynecologic in nature.

Survival rates for women with early stage ovarian carcinoma range from 70% to 90% compared with 20–30% for women with advanced disease.⁹ Because of the dramatic differences in these rates, many research efforts are focusing on methods of early detection. Unfortunately, screening programs (transvaginal ultrasound and CA

125) have not been shown to impact on the morbidity or mortality of women who develop epithelial ovarian carcinoma.¹⁰ Of note, in a prospective survey of 83 women with ovarian carcinoma, Smith and Anderson¹¹ found that 75% of women with early stage disease did report symptoms, but greater than 90% believed that the symptoms they were experiencing were related to menstrual irregularities, menopause, aging, or some other nonserious condition. These authors concluded that with better education of health care providers and patients, many ovarian carcinomas can be identified early if patients seek medical attention for these symptoms.

The purpose of our study was to conduct a large national survey of women with ovarian carcinoma to help identify specific symptoms and potential causes in delayed diagnosis.

METHODS

In May of 1998, a survey was mailed to 1500 women who subscribe to the newsletter about ovarian carcinoma, *CONVERSATIONS! The International Newsletter for Those Fighting Ovarian Cancer*. In addition, there was a letter that accompanied the survey explaining the importance and rationale for the questions asked. Women were given a self-addressed envelope to return the form. Women in cancer support groups were allowed to copy the survey and distribute it to other patients with ovarian carcinoma. One thousand seven hundred twenty-five surveys were returned, 1327 original and 398 copies. The response rate for original surveys was 88%. Although surveys were meant to be anonymous, greater than 80% of women included a return address, and 30% included letters with additional information.

The survey was two pages (a single sheet front and back) and contained questions about the type of symptoms experienced before diagnosis and the length of the time women had those symptoms. The list of symptoms was generated from published reports and small focus groups. Patients were asked the date they first saw their health care provider about their symptoms and the date the diagnosis of ovarian carcinoma was made. From these two questions, we were able to calculate the time required for a health care provider to make the correct diagnosis. Women were asked about the type of health care provider seen, what tests were ordered, whether a pelvic exam was performed, and any diagnosis or treatment they received before the diagnosis of ovarian carcinoma. Patients also were asked about their perceptions of barriers to receiving a prompt diagnosis. In addition, patients were asked to provide their age at diagnosis, insurance type, International Federation of Gynecol-

ogy and Obstetrics (FIGO) stage¹² if they knew it, whether they received chemotherapy, and the city and state they resided in when the diagnosis was made.

Statistical analysis were performed in the following manner. Continuous variables were compared using independent *t* tests for two groups and analysis of variance for more than two. Post hoc tests were performed with a Student–Newman–Keuls test. Chi-square (for multiple groups) or Mann–Whitney *U* (for two groups) tests were used to examine differences in categorical variables. A stepwise linear regression was conducted to determine the contribution of various factors to dependent variables such as delay between first seeing a health care provider and the ultimate diagnosis of ovarian carcinoma, or the stage at diagnosis. All analyses were two-tailed and were performed using SPSS for Windows versions 8.05 and 9.0 (SPSS Inc., Chicago, IL).

RESULTS

Surveys were returned by 1725 women from 46 states and 4 Canadian provinces. The median age of the surveyed patients was 52 years (range, 18–84), and 13% were older than age 65 years. At the time of diagnosis, 71% of respondents had FIGO Stage III/IV disease and 95% of all the patients reported receiving chemotherapy. Greater than 50% of patients had received a diagnosis and were treated within the last 2 years. The type of insurance women had at the time of diagnosis was reported as private by 45%, Health Maintenance Organization (HMO) by 31%, Medicare by 7%, Medicaid by 1%, and other by 16%.

In response to whether they had symptoms before the diagnosis of ovarian carcinoma, 5% of patients reported they had none, 61% reported increased abdominal size, 57% abdominal bloating, 47% fatigue, 36% abdominal pain, 31% indigestion, 27% urinary frequency, 26% pelvic pain, 25% constipation, 24% urinary incontinence, 23% back pain, 17% pain with intercourse, 16% unable to eat normally, 14% had a palpable mass, 13% vaginal bleeding, 11% weight loss, 9% nausea, 3% bleeding with intercourse, 1% deep venous thrombosis, and 1% diarrhea. When we grouped the responses into symptom categories, we found that 77% reported abdominal symptoms, 70% gastrointestinal, 58% pain, 50% constitutional, 34% urinary, and 26% pelvic. When we evaluated the responses by stage, 11% of those in Stage I/II reported no symptoms compared with 3% in Stage III/IV ($P = 0.001$). Duration of symptoms was reported as 2 months or less by 30% of patients, 3–6 months by 35%, 7–12 months by 20%, and longer than 12 months by 15% of women.

The type of health care provider initially seen by

TABLE 1
Analysis of Survey Results with Respect to Type of Symptom

Survey item	Symptom					
	Pain	Constitutional	GI	Abdominal	Urinary	Pelvic
No. of mos to make diagnosis (mean)	5.6	5.3	4.9	4.8	5.0	7.2
No. of health care provider (mean)	2.4	2.4	2.3	2.3	2.3	2.4
Mean age (yrs)	50	50	51	51	51	48
Delay perceived (%)	60	60	56	54	56	64
Pelvic exam (%) ^a	65	64	64	65	68	72
Treated for another diagnosis (%) ^b	36	34	33	32	36	42
Initial diagnosis						
Nothing	12	12	13	12	14	13
Depression	8	9	7	7	8	7
Stress	16	19	15	14	16	17
Constipation	8	8	8	7	7	7
Irritable bowel	20	20	19	18	17	15
Gastritis	11	10	10	10	9	10
UTI	11	10	10	9	17	13
Other	50	48	46	47	47	55
Ovarian carcinoma	15	17	19	19	20	15
Initial tests						
Colonoscopy	13	15	15	14	12	10
Ultrasound	43	41	42	44	42	43
CT scan	18	20	20	20	18	13
CA 125	16	18	18	18	19	16

GI: gastrointestinal; UTI: urinary tract infection; CT: computed tomography.

^a At initial visit.^b Before diagnosis of ovarian carcinoma.

the women was a family practitioner in 34% of the cases, an obstetrician-gynecologist in 37%, an internist in 16%, a nurse practitioner in 3%, and other in 10% of the cases. Pelvic exams were performed at the initial exam in 67% of patients, and 73% of women had tests ordered. Of those patients who had tests, 45% had an ultrasound, 20% had a computed tomography (CT) scan, 15% had a colonoscopy, 10% had a barium enema, 6% had an upper gastrointestinal series, and 23% had other tests. A CA 125 was ordered for 19% of patients. Of the surveyed women, 33% saw 3 or more providers before the diagnosis of ovarian carcinoma was made.

When asked, "Before your diagnosis of ovarian cancer was made, what did your health care provider think was wrong?" 13% of the survey participants responded that they were told nothing was wrong, 6% were diagnosed with depression, 12% stress, 6% constipation, 15% irritable bowel, 9% gastritis, and 47% were given other diagnoses. Only 20% of patients were told initially they might have ovarian carcinoma. Thirty percent received treatment for another condition. When asked if there were barriers to receiving a prompt diagnosis, 64% believed there were barriers. When asked to elaborate, 22% responded that they

personally ignored their symptoms, 30% reported that the wrong diagnosis was made, 21% reported health care provider attitude as a problem, 6% reported difficulty getting an appointment, and 25% reported other problems resulting in barriers.

Analysis of the type of symptoms patients reported with respect to a variety of factors is shown in Table 1. Of note, women with pelvic symptoms had a longer delay in diagnosis than women with other symptoms. There was no significant difference in the tests ordered, the diagnoses made, or the perception that there was a delay or barriers to diagnosis among any of the symptoms reported.

Evaluation of the number of symptoms that women reported with respect to a variety of factors is shown in Table 2. Women with the most symptoms were significantly younger, required significantly more time to make the diagnosis, and were less likely to receive a diagnosis in an early stage. In addition, they were more likely to be treated for another condition and more likely to perceive that there were barriers to achieving the correct diagnosis and perceive that health care provider attitude toward them was a problem.

Evaluation of factors by the type of health care

TABLE 2
Analysis of Survey Results with Respect to No. of Symptom Groups that Patients Reported

Survey item	No. of symptoms							P value
	0	1	2	3	4	5	6	
No. of mos for diagnosis (mean)	1.8	3.4	2.0	4.0	4.4	6.0	10.7	0.001
Mean age (yrs)	52	55	53	52	51	50	46	0.001
Delay perceived (%)	14	33	37	49	56	68	76	0.001
Pelvic exam (%) ^a	84	71	68	64	66	64	66	0.013
Treated for another diagnosis (%) ^b	16	23	21	28	32	41	50	0.001
Health care provider attitude a problem (%)	5	9	10	20	26	31	38	0.001
Stage I/II (%)	38	34	20	19	20	20	19	0.001

^a At their initial visit.

^b Initially had the wrong diagnosis.

TABLE 3
Analysis of Survey Results with Respect to Health Care Provider First Seen

Survey item	FM	ObGyn	IM	P value
No. mos to make diagnosis (mean)	4.7	4.5	3.6	0.40
No. of doctors (mean)	2.3	1.8	2.3	0.001
Delay perceived (%) ^a	53	45	57	0.006
Pelvic exam (%)	50	94	43	0.001
Ordered tests (%) ^a	68	76	68	0.008
Barriers to diagnosis (%)	69	56	70	0.001
Wrong diagnosis (%)	33	24	30	0.005
Health care provider attitude (%)	21	20	20	0.75
Stage I/II (%)	18	29	18	0.009

FM: family medicine; ObGyn: obstetrician-gynecologist; IM: internal medicine.

^a At their initial visit.

provider first seen is shown in Table 3. Time required to make the diagnosis was similar for all three health care provider types. Pelvic exams and tests were performed more frequently by obstetrician-gynecologists. Patients also reported less perception of a barrier, less delay, and fewer wrong diagnoses for obstetrician-gynecologists compared with internists and family practitioners. Significantly more Stage I/II tumors were diagnosed by obstetrician-gynecologists than by the other health care providers.

Evaluation of factors by type of insurance coverage is shown in Table 4. There were no significant differences in perception of delay or time to make diagnosis. Women in private and Medicare insurance plans, when compared with women in HMOs or other insurance plans, were more likely to have had tests ordered at their initial health care provider visit, less likely to report that the wrong diagnosis was made initially, and less likely to perceive that there were barriers to their diagnosis.

Analysis of factors by the number of months required to make a diagnosis of ovarian carcinoma is shown in Table 5. As the time required to make the diagnosis increased, the percentage of women with any symptoms increased significantly. The number of health care providers seen, the perception of barriers, and the percentage of patients who initially received the wrong diagnosis all significantly increased as well. Significant decreases in the percentage of patients who initially received a pelvic exam, pelvic ultrasound, abdominal pelvic CT scan, and CA 125 were observed as the time required to make the diagnosis increased. In addition, there was a trend of fewer women diagnosed with early stage disease as the time required to make the diagnosis increased ($P = 0.10$).

Analysis of factors by stage is shown in Table 6. Women with advanced stage were significantly more likely to have symptoms than women with early stage disease, but the types of symptoms were similar between the two groups. Significant differences in perceptions of delay, percentage of women who initially received a pelvic exam, percentage with initial wrong diagnosis, and percentage who believed health care provider attitude was a problem were demonstrated when comparing women with early versus late stage disease.

Comparison also was made between women who self-reported that they ignored their symptoms and those women who believed they had not ignored their symptoms. Women who ignored their symptoms were significantly more likely to report all symptom groups except for pelvic symptoms, and they were significantly more likely to have more total symptoms. In addition, women who ignored their symptoms were significantly more likely to have advanced stage disease compared with those who did not ignore their symptoms (85% vs. 74%; $P = 0.002$).

TABLE 4
Analysis of Survey Results with Respect to Type of Insurance

Survey item	Private	HMO	Other	Medicare	P value
Delay perceived (%)	47.5	53.3	51.8	42.4	0.139
Pelvic exam ^a (%)	70.2	64.1	70.5	60.0	0.190
No tests ordered ^a (%)	26.7	27.9	26.4	12.6	0.014
Barriers to diagnosis (%)	59.4	69.2	66.8	59.8	0.015
Wrong diagnosis (%)	26.2	32.6	34.5	24.1	0.015
Health care provider attitude (%)	18.4	23.0	23.9	12.6	0.062
Stage I/II (%)	24.0	25.0	20.0	15.5	0.272
No. of mos to make diagnosis (mean)	4.1	4.6	4.5	4.0	0.630

HMO: health maintenance organization.

^a At initial visit.

We also evaluated survey responses between women who received a diagnosis before and after 1997 to see if there were significant differences between the group who received a diagnosis recently and those who received a diagnosis more than a year and a half earlier. Comparison of number of months to make diagnosis, age, stage, percentage who reported a pelvic exam at first visit, initial incorrect diagnosis, and symptoms being ignored were no different between the two groups. Women who received a diagnosis after 1997 were more likely to report constitutional symptoms (54% vs. 48%; $P = 0.04$), gastrointestinal symptoms (81% vs. 76%; $P = 0.01$), and urinary symptoms (40% vs. 31%; $P = 0.001$). Women who received a diagnosis after 1997 were less likely to initially see an obstetrician-gynecologist (37% vs. 48%; $P = 0.01$) and were more likely to have HMO insurance (37% vs. 27%; $P = 0.01$). All other comparisons showed no significant difference.

Multivariate analysis was performed with linear regression to evaluate factors that were associated with the number of months to make a diagnosis. Only 20% of the delay is explained by the factors we evaluated. The factors most significantly associated with delayed diagnosis were amount of time patients had symptoms ($P = 0.001$), the number of health care providers seen ($P = 0.06$), symptoms being ignored ($P = 0.07$), and initial incorrect diagnosis ($P = 0.08$).

DISCUSSION

This study represents to our knowledge the largest survey of women with ovarian carcinoma in the United States and Canada. One of the strengths of this study is that we have obtained symptom data directly from patients, thus eliminating another person's interpretation of what the patient describes. The ability of patients to self-report symptoms has been validated in multiple studies.¹³⁻¹⁵ This study is also notable for

the high response rate of participants and the large geographic diversity of the surveyed women. However, despite the high number of patients who responded to the survey, there are potential biases that may affect the data analysis. First, there may be significant selection bias because the only women who participated in this study were those who subscribe to the *CONVERSATIONS!* newsletter and/or those who participate in support groups for women with ovarian carcinoma. Although the stage and age distribution of our patients is typical of what is found in the general population, women with ovarian carcinoma who are active in support groups may not truly be a representative sample. Our other concern is that recall bias may have affected the results. However, greater than 50% of patients who received a diagnosis within 2 years of the study, and comparison of results between those who received a diagnosis beyond 2 years to those who received a diagnosis more recently showed only minor differences between the 2 groups. In addition, factors such as the stage, whether or not a pelvic examination was performed, or the health care provider's initial differential diagnosis cannot be verified. All of these potential biases could be eliminated with a prospective population-based study in which women who recently received a diagnosis were surveyed or interviewed, and medical records were abstracted to verify medical provider information. In addition, these women could be observed prospectively to see if prompt diagnosis impacts survival. Also, establishing the percentage of women without ovarian carcinoma who experience symptoms similar to those of women with ovarian carcinoma and their providers' response to these symptoms are important areas for additional research.

This study confirms what several smaller studies^{5-11,16} already have suggested: women with ovarian carcinoma do have symptoms in contrast to what is stated

TABLE 5
Analysis of Survey Results with Respect to No. of Mos Required to Make the Diagnosis of Ovarian Carcinoma

Survey item	No. of mos				P value
	0-2	3-6	7-12	> 12	
No. of doctors (mean)	1.8	2.5	2.7	3.3	0.001
Mean age (yrs)	52	51	50	47	0.001
Delay perceived (%)	29	80	87	87	0.001
Pelvic exam ^a (%)	70	66	65	58	0.016
Wrong diagnosis (%)	15	49	50	69	0.001
Health care provider attitude a problem (%)	10	35	39	47	0.001
Stage I/II (%)	24	21	19	13	0.10
Initial diagnosis					
Nothing	8	17	17	20	0.001
Depression	2	8	8	21	0.001
Stress	5	18	21	40	0.001
Constipation	4	10	9	9	0.002
Irritable bowel	8	23	24	36	0.001
Gastritis	6	12	10	15	0.001
UTI	7	9	12	13	0.052
Ovarian carcinoma	30	7	6	1	0.001
Symptoms					
Pain	52	70	77	80	0.001
Constitutional	46	58	60	63	0.001
GI	69	71	78	85	0.001
Abdominal	77	80	83	93	0.001
Urinary	33	37	35	45	0.08
Pelvic	22	29	46	46	0.001
Initial tests					
None	15	46	42	45	0.001
UGI	5	7	10	9	0.034
Colonoscopy	12	13	14	13	0.70
Ultrasound	58	28	25	24	0.001
CT scan	27	11	7	7	0.001
CA 125	26	9	10	5	0.001

UTI: urinary tract infection; UGI: upper gastrointestinal tract study; CT: computed tomography.

^a At initial visit.

in most textbooks¹⁻⁴ and taught in most medical schools. The symptoms most commonly seen are those related to abdominal bloating and gastrointestinal disturbances. Specific gynecologic symptoms were reported by only 25% of the surveyed women in our study, and this is almost identical to what others have reported.^{11,16} Many women stated that they attributed their symptoms to menopause, getting older, or the stress of the multiple demands on their lives.

Comparison of symptoms between the 385 women with early stage (Stage I/II) versus 1209 women with late stage (Stage III/IV) disease revealed that women with advanced disease were more likely to be symptomatic (97% vs. 89%). However, still only 11% of women with early stage disease reported that they were completely asymptomatic. This is similar to a prospective population-based study conducted by Smith and Anderson,¹¹ in which interviews were conducted on 36 women with

local disease and 46 women with distant disease. In that study, 78% of women with early stage disease reported symptoms. As with our study, Smith and Anderson found that there was not a significant difference in the type of symptoms women reported when analyzed by stage presentation.

Delay in diagnosis was a common problem in this study and resulted from both patient-related as well as health care provider-related problems. In our study, women experienced symptoms for a median of 2-3 months before consulting a health care provider. Women commented that they were unaware that their symptoms could be a sign of cancer, especially ovarian carcinoma. In a study of 160 women with ovarian carcinoma from Sweden,⁶ the average time a woman had symptoms before presenting to a health care provider for evaluation was 12 weeks. Reasons as to why patients delay seeking medical attention when they have cancer are lack of pain or physical disability,

TABLE 6
Analysis of Survey Results with Respect to Stage at Diagnosis

Survey item	Stage I/II	Stage III/IV	P value
No. mos to make diagnosis (mean)	3.9	4.6	0.47
No. of mos patients had symptoms (mean)	4.1	4.8	0.56
No. of health care providers (mean)	2.0	2.3	0.004
Mean age (yrs)	48.3	52.4	0.55
No. of groups of symptoms (mean)	2.8	3.4	0.001
Delay perceived (%)	39	54	0.001
Pelvic exam ^a (%)	79	63	0.001
Treated for other diagnosis (%)	25	32	0.009
Barriers to diagnosis (%)	54	68	0.001
Wrong diagnosis made (%)	19	33	0.001
Health care provider attitude (%)	16	22	0.007
Type of symptoms (%)			
Pain	56	61	0.108
Constitutional	41	54	0.001
GI	58	76	0.001
Abdominal	68	82	0.001
Urinary	33	35	0.167
Pelvic	30	26	0.087

GI: gastrointestinal.

^a At initial visit.

ignorance regarding cancer symptoms, fear, and financial problems.¹¹

When patients in our study were asked if they ignored their symptoms, 22% responded yes. Women who ignored their symptoms were significantly more likely to have more symptoms and significantly more likely to receive a diagnosis with advanced disease. Other authors have shown that when patients procrastinate in consulting a health care provider, this results in more advanced stage tumors and lower survival rates.¹⁷ In another study by DiSilvestro et al. of 137 women with ovarian carcinoma, the severity of symptoms was an important prognostic indicator.¹⁸ Those patients with more symptoms had significantly shorter survival rates compared with patients with minimal or few symptoms. All of this information suggests that education of women could impact patient-related delays in diagnosis of ovarian carcinoma. Women are often unaware of what constitutes normal physiologic changes with aging as opposed to pathologic changes. Educational efforts need to focus on these issues.

Health care provider-related delay was also observed in our study. The time for health care provider delay was calculated from the date the patient first saw her health care provider to the date the diagnosis was made. A diagnosis of ovarian carcinoma was made in 0–2 months in 55%, 3–6 months in 19%, 7–12 months in 15%, and longer than 12 months in 11% of women surveyed. Two other investigators have looked

at the issue of health care provider delays. In a study by Wikborn et al.⁶ of 160 Swedish women with ovarian carcinoma, 30% of women had not received a correct diagnosis within 8 weeks after first consultation. In reviewing these patients' records, the authors conclude that the vague symptoms often mislead health care providers, and patients were treated for other conditions. In another study by Flam et al.⁸ evaluating 362 Swedish women with ovarian carcinoma, 77% of patients received a diagnosis in less than a month. Flam et al. attribute the short health care providers' delay to the fact that these patients all lived in an urban area with easy access to health care and specialists. In addition, most patients were examined initially by obstetrician-gynecologists, which the authors believed contributed to prompt diagnosis. When we evaluated health care provider delay in our study, we did not find significant differences in time to make diagnosis between gynecologists, internists, and family practice physicians. Gynecologists were, however, significantly more likely to diagnose early stage tumors, more likely to do a pelvic exam, more likely to order tests, and according to patients, less likely to make the wrong diagnosis. A limitation of our study is that none of these findings was validated from medical records, and there could be many confounding reasons for these findings. However, these observations do suggest other areas in which educational efforts for health care providers could be targeted.

Incorrect initial diagnoses also were associated with diagnostic delay in our study, especially when the patient was labeled as suffering from stress, depression, irritable bowel syndrome, or nothing. In addition, not having a pelvic exam at the first visit and not having a CT scan, ultrasound, or CA 125 ordered also were associated with delays. As health care provider delay increased, the percentage of women with early stage disease decreased. Other authors who have evaluated health care provider-related delay attribute it to the vagueness of the symptoms that often lead patients to specialists in internal medicine or general surgery.^{6,8} Because the incidence of ovarian carcinoma is not high (1 in 70 lifetime risk), many of these physicians are not familiar with the symptoms. Another issue identified in our study is that a significant percentage of women, 21% overall, believed their health care providers' attitude toward their symptoms resulted in barriers to their getting a prompt diagnosis. As health care provider delay increased, that percentage of women who believed their health care provider's attitude was a problem increased to almost 50%. When evaluating health care provider delay with respect to insurance coverage, we did not find significant differences between private, HMO, Medicare, or

other insurance plans. Of note, multivariate analysis revealed that only 20% of the delay in our study could be attributed to the factors we analyzed. Therefore, clearly further study is needed to identify the causes of both health care provider- and patient-related delay so that we can work to eliminate them.

Some may argue that the costs of an evaluation to rule out ovarian carcinoma in all woman presenting with vague abdominal and pelvic complaints would be too great. Although most women with abdominal, pelvic or constitutional complaints will not have ovarian carcinoma, it is important for health care providers to perform pelvic exams on these women before labeling them with a diagnosis such as stress, depression, or irritable bowel syndrome. Pelvic exams do not add to the cost of an evaluation. In addition, most ovarian carcinomas can be diagnosed with a pelvic ultrasound and do not require an exhaustive evaluation to rule out the disease.

Unfortunately, most women with epithelial ovarian carcinoma receive a diagnosis of Stage III/IV disease when the chance of cure is low. However, even for women who present with higher stage disease, there are significant differences in survival rates between those who present with disease that can be completely cytoreduced versus those who present with disease that cannot.¹⁹ The results of our study suggest that we may be able to reduce delays in diagnosis by better educating both patients and health care providers about the symptoms of ovarian carcinoma. If eliminating delays in diagnosis does allow discovery of early stage disease or performance of optimal cytoreduction for advanced stage disease, then survival statistics for women with epithelial ovarian carcinoma should improve.

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