Intended care seeking for ovarian cancer symptoms among U.S. women

Crystale Purvis Cooper [a], Cynthia A. Gelb [b,*], Katrina F. Trivers [b], Sherri L. Stewart [b]

[a] Soltera Center for Cancer Prevention and Control, Tucson, AZ 85704, USA
[b] Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA

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ABSTRACT

To investigate U.S. women's intended care seeking for symptoms associated with ovarian cancer, data from the 2012 HealthStyles Fall survey of U.S. adults were examined. Analyses were limited to women with no history of gynecologic cancer ($N = 1726$). Logistic regression models for intended care seeking within 2 weeks of symptom onset were developed. A minority of women recognized that unexplained pelvic or abdominal pain (29.9%), unexplained bloating (18.1%), and feeling full after eating a small amount of food (10.1%) can indicate ovarian cancer, and 31.1% mistakenly believed that the Papanicolaou (Pap) test screens for the disease. In the multivariate regression models, the most consistent, significant predictors ($p < 0.01$) of intended care seeking within 2 weeks of symptom onset were age (older women were more likely to seek care) and awareness that symptoms could signal ovarian cancer. Care seeking in response to ovarian cancer symptoms may be delayed among younger women and those who do not recognize the potential significance of symptoms. Raising awareness of ovarian cancer symptoms may promote early detection. However, educational efforts should emphasize that symptoms associated with ovarian cancer may also result from benign conditions.

Introduction

Ovarian cancer causes more deaths in the United States than any other cancer of the female reproductive system. Annually, more than 20,000 U.S. women are diagnosed with ovarian cancer and more than 14,000 die from the disease (U.S. Cancer Statistics Working Group, 2014). Treatment is most effective when ovarian cancer is found at an early stage. However, no population-based screening test is recommended for ovarian cancer detection, and most ovarian cancers are diagnosed at a late stage (Su et al., 2013).

While ovarian cancer has been widely referred to as a "silent killer," symptoms commonly associated with the disease have been identified (Goff, 2012). Unfortunately, awareness of ovarian cancer symptoms among U.S. women is low (Trivers et al., 2011; Cooper et al., 2013; Lockwood-Rayermann et al., 2009). In addition, the misconception that the Papanicolaou (Pap) test detects ovarian cancer is common (Lockwood-Rayermann et al., 2009; Hawkins et al., 2011; Cooper et al., 2011), and has been found to engender a false sense of security in some women (Cooper et al., 2011). Given the absence of a population-based screening test for ovarian cancer, early detection can depend on women reporting symptoms to health care providers (Su

et al., 2013; Goff et al., 2000). The present study investigated U.S. women's intended care seeking for symptoms associated with ovarian cancer.

Methods

The HealthStyles Fall survey is an annual survey conducted by Porter Novelli (Washington, D.C.) that explores the health behaviors and attitudes of U.S. adults. The 2012 HealthStyles Fall survey was administered online from September 21–October 5. The survey items analyzed here were licensed by the Centers for Disease Control and Prevention's *Inside Knowledge: Get the Facts about Gynecologic Cancer* campaign (Centers for Disease Control and Prevention, 2015), to inform the campaign's initiatives to increase women's understanding of gynecologic cancer.

Participants

Participants in the 2012 HealthStyles Fall survey were recruited from the KnowledgePanel®, a 50,000 member online research panel that is representative of the U.S. population (GFK Knowledge Networks, 2015). Panel members were randomly recruited through probability-based sampling, using both random-digit dial and address-based sampling methods. If needed, panel members were provided with a laptop computer and Internet access so they could take part in surveys.

The 2012 HealthStyles Fall survey was sent to a random sample of 4371 panel members aged 18 years or older who responded to an

* Corresponding author at: Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, MS F-76, Atlanta, GA 30341, USA. Fax: +1 770 488 4760.
    E-mail address: cgelb@cdc.gov (C.A. Gelb).

earlier linked survey (HealthStyles Spring survey). A total of 3503 participants (1733 men and 1770 women) took part in the survey, for a completion rate of 80.1%. However, the analyses reported here were limited to women with no history of gynecologic cancer (N = 1726).

The 2012 HealthStyles Fall survey was administered by Porter Novelli and complied with the ICC/ESOMAR International Code for ethical research (Esomar, 2008). To protect participant confidentiality, no individual identifiers were included in the dataset received by investigators. CDC Institutional Review Board (IRB) approval was not required for this project because CDC licensed the 2012 HealthStyles data analyzed from Porter Novelli and was not engaged in human subjects research (secondary data analysis).

Measures

Ovarian cancer symptom awareness was assessed by asking respondents, "Which of the following could be a warning sign of ovarian cancer?" The response options included three symptoms that are commonly associated with ovarian cancer (Goff, 2012): "unexplained pelvic or abdominal pain," "unexplained bloating," and "feeling full after eating a small amount of food," as well as eight other symptoms (e.g. "vaginal itching that does not get better with over-the-counter treatments/creams"), "none of these," and "not sure." Multiple responses to this item were accepted unless "none of these" or "not sure" was selected.

Timing of intended care seeking in response to symptoms was assessed by asking respondents, "If you began experiencing any of the following and it was not normal for you, when would you contact a doctor or other health professional?" Respondents were asked to provide a separate response for each of the symptoms included in the ovarian cancer symptom awareness item; five response options were provided: "within a few days," "within 1–2 weeks," "within several weeks," "after several months," and "I would probably not call or see a doctor."

Analyses

Investigators calculated weighted proportions (matched to 2012 U.S. estimates on gender, age, household income, race/ethnicity, educational attainment, and geographic region) for demographic characteristics, ovarian cancer symptom awareness, and timing of intended care seeking in response to symptoms. Pearson chi-square tests were used to compare timing of intended care seeking for each of the three ovarian cancer symptoms studied by participant characteristics and awareness that each symptom could signal ovarian cancer. In this analysis, the response categories for timing of intended care seeking were collapsed into "≤2 weeks" (which included "within a few days" and "within 1–2 weeks"), ">2 weeks" (which included "within several weeks," "after several months," and "I would probably not call or see a doctor"). The covariates found to be significant ($p < 0.05$) in the bivariate analyses were included in adjusted, forward-stepwise logistic regression models to predict intended care seeking within 2 weeks of symptom onset for each of the three symptoms analyzed.

Results

A minority of women (10.1%–29.9%) recognized the symptoms that could signal ovarian cancer, and 31.1% mistakenly believed that the Pap test screens for ovarian cancer (Table 1).

Intended care seeking for symptoms within 2 weeks of their onset ranged from 28.2% (feeling full after eating a small amount of food) to 65.7% (unexplained pelvic or abdominal pain). No intended care seeking for symptoms ranged from 8.4% (unexplained pelvic or abdominal pain) to 32.8% (feeling full after eating a small amount of food).

Covariates significantly associated with intended care seeking within 2 weeks of symptom onset in the bivariate analyses (Supplemental

Table 1
Participant characteristics, ovarian cancer symptom awareness, awareness that Papanicolaou (Pap) test does not screen for ovarian cancer, and timing of intended care seeking for symptoms, U.S. Women, 2012 HealthStyles Fall Survey (N = 1726).

		Unweighted n^a	Weighted $\%^b$
Participant characteristics			
Age (years)	18–29 years	277	18.6
	30–44 years	375	27.3
	45–59 years	524	26.9
	≥60 years	550	27.2
Race/ethnicity	Caucasian	1272	65.0
	African-American	188	13.0
	Hispanic	172	15.2
	Other	94	6.9
Educational attainment	<High school	91	10.7
	High school	496	33.7
	Some college	545	28.8
	≥Bachelor degree	594	26.8
Geographic region	Northeast	336	18.8
	Midwest	434	22.2
	West	369	22.1
	South	587	36.9
Health insurance coverage	Insured	1450	81.2
	Uninsured	266	18.8
Awareness that Pap does not screen for ovarian cancer			
Aware		1204	68.9
Unaware		506	31.1
Awareness that symptom could signal ovarian cancer			
Unexplained pelvic or abdominal pain	Aware	575	29.9
	Unaware	1105	70.1
Unexplained bloating	Aware	363	18.1
	Unaware	1317	81.9
Feeling full after eating a small amount of food	Aware	183	10.1
	Unaware	1497	89.9
Timing of intended care seeking for symptoms			
Unexplained pelvic or abdominal pain	Within a few days	558	32.9
	Within 1–2 weeks	602	32.8
	Within several weeks	304	19.2
	After several months	100	6.7
	I would probably not call or see a doctor	115	8.4
Unexplained bloating	Within a few days	189	10.8
	Within 1–2 weeks	462	26.9
	Within several weeks	456	25.0
	After several months	183	12.0
	I would probably not call or see a doctor	380	25.4
Feeling full after eating a small amount of food	Within a few days	120	7.0
	Within 1–2 weeks	382	21.2
	Within several weeks	441	25.7
	After several months	197	13.2
	I would probably not call or see a doctor	537	32.8

[a] Analyses were limited to women who had never been diagnosed with gynecologic cancer. When variable responses do not sum to N, responses are missing unless otherwise noted.
[b] Data were weighted to match 2012 U.S. Census estimates for age, household income, race/ethnicity, educational attainment, and geographic region.

Table) were included in the adjusted logistic regression models: age, race/ethnicity, educational attainment, geographic region, health insurance coverage, and awareness that symptom can signal ovarian cancer. Across the three symptoms modeled, intended care seeking within 2 weeks of symptom onset was most likely among women ≥60 years old and those who were aware that the symptom analyzed could signal ovarian cancer (Table 2). Intended care seeking for unexplained bloating and feeling full after eating a small amount within 2 weeks of onset was more likely among African-American and Hispanic women than Caucasian women and least likely among women living in the Southern U.S. states. Finally, insured women were more than twice as likely as uninsured women to report intended care seeking for unexplained pelvic or abdominal pain within 2 weeks of onset.

Table 2
Significant predictors of intended care seeking for symptoms associated with ovarian cancer within 2 weeks, multivariate logistic regression, U.S. Women, 2012 HealthStyles Fall Survey ($N = 1726$).

Model	Symptom	Significant predictors of intended care seeking	Predictive category	AOR	95% CI	*p*-value[a]	Reference category
1	Unexplained pelvic or abdominal pain	Age	18–29 years	0.53	0.38, 0.73	**<0.001**	≥60 years
			30–44 years	0.53	0.39, 0.71	**<0.001**	
			45–59 years	0.76	0.56, 1.03	0.074	
		Health insurance coverage	Insured	2.17	1.67, 2.83	**<0.001**	Uninsured
		Awareness that symptom can signal ovarian cancer	Aware	1.41	1.11, 1.79	**0.005**	Unaware
2	Unexplained bloating	Age	18–29 years	0.47	0.34, 0.64	**<0.001**	≥60 years
			30–44 years	0.47	0.36, 0.63	**<0.001**	
			45–59 years	0.62	0.47, 0.82	**0.001**	
			African American	1.81	1.32, 2.47	**<0.001**	
		Race/ethnicity	Hispanic	1.66	1.22, 2.26	**<0.001**	Caucasian
			Other	1.09	0.71, 1.67	0.709	
		Region	Northwest	1.53	1.15, 2.04	**0.004**	South
			Midwest	1.01	0.76, 1.34	0.967	
			West	1.17	0.88, 1.56	0.274	
		Awareness that symptom can signal ovarian cancer	Aware	1.72	1.32, 2.23	**<0.001**	Unaware
3	Feeling full after eating a small amount of food	Age	18–29 years	0.36	0.25, 0.51	**<0.001**	≥60 years
			30–44 years	0.46	0.34, 0.62	**<0.001**	
			45–59 years	0.63	0.47, 0.83	**0.001**	
			African American	1.89	1.37, 2.63	**<0.001**	
		Race/ethnicity	Hispanic	1.51	1.09, 2.10	**0.014**	Caucasian
			Other	0.78	0.47, 1.29	0.329	
		Region	Northwest	1.65	1.21, 2.24	**0.002**	South
			Midwest	1.55	1.14, 2.10	**0.005**	
			West	1.66	1.22, 2.26	**0.001**	
		Awareness that symptom can signal ovarian cancer	Aware	1.70	1.21, 2.38	**0.002**	Unaware

Note: Forward-stepwise logistic regression models included variables found to be significant in bivariate analyses (Supplemental Table): age, race/ethnicity, geographic region, health insurance coverage, and awareness that symptom can signal ovarian cancer. Data were weighted to match 2012 U.S. Census estimates for age, household income, race/ethnicity, educational attainment, and geographic region. Analyses were limited to women who had never been diagnosed with gynecologic cancer.

[a] Boldface indicates statistical significance ($p < 0.05$).

Discussion

Many women were not familiar with the ovarian cancer symptoms included in the study. This knowledge deficit consistently translated into lower rates of intended care seeking within 2 weeks of symptom onset, and this association persisted when demographic covariates were controlled in logistic regression models.

Similarly, an analysis of UK women found low recognition of symptoms associated with ovarian cancer and variation in intention to seek care for these symptoms (Low et al., 2013). Conversely, in a study of Welsh women, ovarian cancer symptom awareness was not associated with delayed care seeking; however, respondents' awareness of ovarian cancer symptoms was much higher than in the current study (Brain et al., 2014).

Age was also a significant predictor of intended care seeking in the present study, with older women being more likely to report intended care seeking within two weeks of symptom onset. This finding is consistent with prior research which examined anticipated care seeking in response to symptoms associated with lung, colorectal, and breast cancer (Quaife et al., 2014). The regional and racial/ethnic differences found in the present study related to intended care seeking for unexplained bloating and feeling full after eating a small amount of food may indicate cultural differences in the interpretation of these symptoms or care seeking in general. Health insurance coverage was found to be a significant predictor for intended care seeking for only one of the symptoms studied—unexplained pelvic or abdominal pain. However, the other symptoms analyzed were associated with low rates of intended care seeking, which may have muted the potential significance of insurance coverage.

It should be noted that the present study did not include psychological covariates, such as embarrassment of symptom or fear of cancer which were found to be major contributors to care seeking delay in response to cancer symptoms in a systematic review of this topic (Smith et al., 2005). Further, Walter et al.'s (2012)

refinement of the Anderson Model of Total Patient Delay to apply the framework to cancer diagnosis recognizes the potential role of psychological/social/cultural factors, co-morbidities, provider/health system factors, and other variables not included in the present study. In addition, the representativeness of women in the present study may be limited by the use of a preassembled research panel. While data were weighted to reflect the U.S. population, the extent to which results are generalizable is not known. In addition, the present study investigated intended care seeking in a hypothetical context, and women may respond differently in real life. Also, the data are cross-sectional; thus, it is not possible to dissect how covariates and intended care seeking are linked.

The five-year survival rate for late-stage ovarian cancer is approximately 30% (Su et al., 2013). Early detection leading to improved survival can begin with women reporting symptoms to health care providers. Ongoing and effective efforts are needed to educate women about ovarian cancer symptoms, when to seek care, and the lack of a population-based screening test for ovarian cancer. At the same time, care must be taken to explain to women that the symptoms associated with ovarian cancer may also result from other conditions, many of which are unrelated to cancer and relatively benign.

Early detection leading to improved survival can begin with women reporting ovarian cancer symptoms to health care providers. Ongoing and effective efforts are needed to educate women about ovarian cancer symptoms, when to seek care, and the lack of a population-based screening test for ovarian cancer.

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.pmedr.2016.01.011.

Conflict of interest statement

The authors have no conflicts of interest to declare.

Transparency document

The Transparency document associated with this article can be found, in the online version.

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