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Brief Report

Understanding influenza vaccination rates and reasons for refusal in caregivers and household contacts of cancer patients

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Cancer patients are at increased risk for morbidity and mortality from seasonal influenza but are known to respond poorly to influenza vaccination. This single-center survey suggests that approximately one-third of cancer patients and their caregivers and family did not receive the vaccine in the prior season. Patients felt strongly that caregiver vaccination was important, whereas caregivers' decisions did not appear to be affected by the patients' disease.

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Cancer patients are at increased risk for morbidity and mortality from seasonal influenza.¹ Vaccination is cost-effective and the primary form of prevention,¹ but efficacy is notably poor among these patients.² Household transmission of influenza is an important risk,^{3,4} so vaccinating close contacts is recommended to provide protection for vulnerable populations.⁵⁻⁷ We aimed to understand vaccination rates among patients, their caregivers and family visiting our cancer center, and factors that influenced vaccination.

METHODS

We conducted a single-center, cross-sectional, anonymous survey of patients, caregivers and family at a cancer center that provides ambulatory care to patients in the Pacific Northwest receiving treatment for hematologic and solid tumor malignancies with >70,000 outpatient visits per year. The survey instrument was formulated to assess vaccination uptake during the 2013-2014 season among patients and their accompanying caregivers and family. Questions assessed vaccination, barriers, and current and preferred sources of

information about vaccines. The initial draft was developed by investigators, then reviewed and modified by patients and clinical staff through small group discussion and e-mail review. Surveys were given in the clinic and designed for completion prior to appointments. The denominator of eligible patients was determined from the total number of appointments and arrivals during the period of the survey distribution.

Surveys were administered during a 6-week period from June 2014 to July 2014 in 2 clinical areas (general oncology and infusion). Front desk staff offered the survey to patients, caregivers and family at the time of check-in. Surveys were voluntary and anonymous. All surveys included an introduction addressing study goals and a complementary bottle of hand sanitizer. Statistical comparisons were performed using the χ^2 test for categorical variables and Mann-Whitney U rank sum analyses for continuous variables. Analyses were performed in STATA 9.4 (StataCorp LLC, College Station, TX). All study procedures were approved by the center's institutional review board.

RESULTS

During the study period, 703 of 2,145 (33%) patients and 146 caregivers and family completed the survey. A total of 508 of 703 (72%) patients and 103 of 146 (71%) caregivers and family reported that they were vaccinated for influenza in the prior year (Table 1). The median age for vaccinated respondents was older than for those unvaccinated (patients: vaccinated 58 years [interquartile range

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Conflicts of interest: None to report.

Table 1
Survey responses stratified by patients and caregivers and vaccination status

Variables	Patients N = 703		Caregivers and family N = 146	
	Vaccinated	Not vaccinated	Vaccinated	Not vaccinated
Number of respondents	508 (72)	195 (28)	103 (71)	43 (29)
Age, y				
≤25	5 (1)	8 (4)	0 (0)	1 (2)
26–40	35 (7)	27 (14)	11 (11)	7 (16)
41–65	324 (64)	137 (70)	68 (66)	25 (58)
65+	141 (28)	22 (11)	24 (23)	10 (23)
Sex				
Female	314 (62)	123 (63)	19 (18)	9 (21)
Male	120 (24)	49 (25)	69 (67)	30 (65)
Do you live within 30 miles of the center?				
Yes	243 (48)	91 (47)	56 (54)	15 (35)
No	183 (36)	69 (35)	47 (46)	28 (65)
How did you receive information about the flu vaccine from the center?				
Did not receive any information	259 (51)	105 (54)	55 (53)	27 (65)
Provider	132 (26)	34 (17)	18 (17)	7 (16)
Signs in clinic	54 (11)	31 (16)	19 (18)	5 (12)
Brochure/fact sheet	19 (4)	12 (6)	7 (7)	3 (7)
Mail	7 (1)	4 (2)	0 (0)	1 (2)
Website	4 (1)	2 (1)	0 (0)	1 (2)
Social media	6 (1)	4 (2)	1 (1)	0 (0)
Other	28 (6)	7 (4)	5 (5)	3 (7)
How did you receive information about the flu vaccine from sources other than the center?				
Medical provider	186 (37)	48 (25)	33 (32)	7 (16)
Pharmacist	97 (19)	23 (12)	20 (19)	3 (7)
TV/radio	85 (17)	36 (18)	17 (17)	11 (26)
Newspaper/magazine	49 (10)	17 (9)	13 (13)	5 (12)
Friend/family member	52 (10)	17 (9)	10 (10)	7 (16)
Website	15 (3)	9 (5)	3 (3)	3 (7)
Social media	15 (3)	10 (5)	1 (1)	1 (2)
Other	79 (16)	11 (6)	19 (18)	2 (5)
Did not receive any information	89 (18)	60 (31)	18 (17)	21 (49)
Which methods of communication do you prefer for flu vaccine info?				
Cancer center provider	184 (36)	66 (34)	22 (21)	11 (26)
Non–cancer center provider	111 (22)	8 (4)	22 (21)	5 (12)
Brochure/fact sheet	67 (13)	29 (15)	18 (17)	11 (26)
Signs in clinic	95 (19)	19 (10)	24 (23)	7 (16)
Pharmacist	50 (10)	1 (1)	20 (19)	2 (5)
Cancer center website	31 (6)	8 (4)	6 (6)	5 (12)
Social media	10 (2)	2 (1)	2 (2)	2 (5)
TV/radio	44 (9)	12 (6)	16 (16)	9 (21)
Newspaper/magazine	18 (4)	4 (2)	10 (10)	4 (9)
Non–cancer center Web site	12 (2)	1 (1)	3 (3)	2 (5)
Other	48 (9)	20 (10)	6 (6)	2 (5)
Plan to get the flu vaccine next year?				
Yes	467 (92)	45 (23)	95 (92)	6 (14)
No	2 (<1)	82 (42)	0 (0)	24 (56)
Undecided	22 (4)	58 (30)	5 (5)	12 (28)

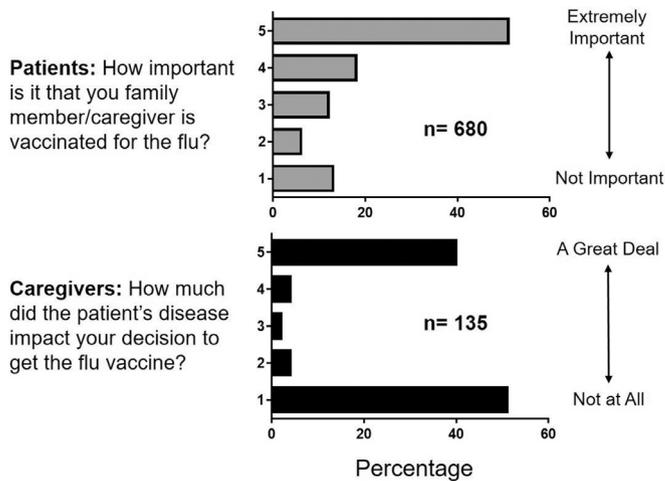
(IQR 50, 66] vs unvaccinated 53 [IQR 43, 60]; caregivers: vaccinated 61 [IQR 52, 69] vs unvaccinated 47 [IQR 33, 57]; both $P < .0001$). Caregivers and family living more than 30 miles from the center were less likely to be vaccinated ($P = .045$), but distance from the center did not affect vaccination rates among patients ($P = .52$). Caregiver and family vaccine status was important to patients, but the patients' disease appeared to have less impact on caregiver decisions (Fig 1).

Most patients, caregivers and family wanted to get information about vaccination from clinicians (369 of 703 [52%] and 60 of 146 [41%], respectively), but only 24% of patients (166 of 703) and even fewer caregivers and family (17%, 25 of 146) recalled receiving such information from cancer providers. More than 50% of patients, caregiver and family respondents reported that they did not receive any information about the vaccine (364 of 703 [52%] and 82 of 146 [58%], respectively). Among the unvaccinated, the most common reasons for not vaccinating were concerns about vaccine components, but this issue was more frequent among nonvaccinated caregivers (74 of 195 [38%] vs 24 of 43 [56%], $P = .04$). Lack of time was a common issue

among unvaccinated caregivers or family when compared to unvaccinated patients (10 of 43 [23%], 23 of 195 [12%]; $P = .06$). A total of 15 of 43 (35%) caregivers and family who were unvaccinated would consider vaccination if it was provided free in the clinic.

DISCUSSION

Our single-center survey suggests that approximately one-third of cancer patients and their caregivers and family did not receive the influenza vaccine in the prior season. Both were less likely to be vaccinated if they were younger, and among the caregivers and family, if they lived farther from the cancer center. Patients felt strongly that caregiver vaccination was important to their care, whereas in contrast, caregivers' decisions did not appear to be affected by the patients' disease. If vaccines were provided at no cost by the center, up to one-third of unvaccinated caregivers and family would consider getting vaccinated.



*Questions noted as asked in the survey instrument. Percentages based on total number of patients who responded to the survey question.

Fig 1. Patients' and caregivers' understanding of the impact or the importance of vaccination of caregivers.

Current guidelines recommend vaccination of close contacts.^{6,7} To our knowledge, our study is one of the few that has evaluated vaccination compliance and assessed how cancer could affect decision making of caregivers and family. We identified that 30% of respondents among patients, caregivers and family did not get vaccinated, indicating opportunities for improvement. Multiple studies focus on vaccination for healthcare workers and patients, but few focus on caregivers and family of cancer patients.^{8,9} Caregivers and family who were younger and lived farther from the center were less likely to be vaccinated, and they appeared to be more concerned about vaccine components when making decisions.

Of the unvaccinated caregivers and family, nearly one-quarter stated that time played a role in not getting the vaccine. Caregivers and family support of cancer patients may limit their opportunities for self-care, including vaccination.¹⁰ Few reported receiving education about the flu vaccine, indicating missed opportunities for health promotion. Although education targeted toward patients has been a focus in many studies,¹¹ tailoring such approaches to include caregivers and family is also important.⁹ Ambulatory appointments can be useful for increasing awareness and education,^{1,8} providing opportunities for shared decision making between patients, caregivers and family, and their providers. Our finding that patients' cancer diagnosis did not appear to affect caregiver and family decision making suggests a need to empower providers and patients to act as advocates for prevention.

This survey was administered after influenza season, so recall bias may have affected responses. Higher rates of vaccination than those

reported nationally may reflect our older patient population. Lower survey response rates may have introduced bias into our results, as those pro- or anti-vaccine may have been more likely to fill out the survey than those who were ambivalent or indifferent to vaccination. The survey was anonymous, so demographics for those who declined to fill out the survey were unavailable. Despite these limitations, the survey did identify opportunities for our influenza vaccine program.

CONCLUSIONS

Those at highest risk for influenza-related complications, but with limited ability to respond to vaccination, may benefit most from efforts to vaccinate household contacts. By using a brief survey to assess barriers to vaccination, we identified targets for improving campaigns for these vulnerable populations. Efforts to enhance education and uptake among caregivers and family of cancer patients are a critical adjunct to patient vaccination programs.

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