Differences in Primary Care Clinicians’ Approach to Non-small Cell Lung Cancer Patients Compared with Breast Cancer

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Background: Lung cancer is a disease with a stigma of being primarily self-induced. We hypothesize that this negative connotation for patients and physicians could lead to differences in referral patterns, treatment, and, ultimately, poorer outcomes compared with patients with non–self-induced diseases. We conducted a survey of primary care physicians to determine whether treatment and referral patterns of breast cancer patients differed from those of lung cancer patients.

Methods: Case scenarios were mailed to 1132 primary care physicians in Wisconsin. Physicians were randomized to receive one of four scenarios on the basis of cancer type and smoking status. Physicians’ referral patterns, length of follow-up, and knowledge about the benefits of chemotherapy were compared.

Results: Six hundred seventy-two physicians replied (response rate 59.4%). On the basis of the responses to the clinical scenarios, physicians were less likely to refer patients with advanced lung cancer than patients with advanced breast cancer (p < 0.001). More physicians knew that chemotherapy improved survival in advanced breast cancer than in advanced lung cancer (p = 0.0145). Breast cancer patients were more likely to be referred for further therapy, whereas lung cancer patients were often referred only for symptom control (p = 0.0092). Yet, when asked directly, physicians stated that type of cancer was not a factor in their decisions to refer patients. There were no statistically significant differences between smoking and nonsmoking patients.

Conclusions: There is a difference in referral patterns and a lack of knowledge in the primary care community regarding the benefit of treatment of patients with lung cancer compared with breast cancer patients.

Key Words: Non-small cell lung cancer, Primary care, Quality of care.

Lung cancer causes more deaths each year than breast, colon, and prostate cancers combined. Because it results from tobacco use in the majority of cases, it is associated with a stigma of being self-induced. This stigma has been studied extensively in the case of HIV/AIDS, with multiple studies showing that a disease-associated stigma negatively affects perception and treatment of the people living with the disease as well as quality of care from physicians. Similarly, there have been a number of studies looking at this issue of stigma in patients with eating disorders and obesity. Nevertheless, few studies exploring guilt, shame, and stigma have been performed for patients with lung cancer. An Italian study has shown that lung cancer patients felt that a stigma existed towards them by their friends, family, and physicians who assumed that their lung cancer had been caused by smoking, even if they had never smoked or had quit smoking years before their diagnosis. Nevertheless, it is unclear whether this stigma affects primary care providers, which could lead to differences in the care and treatment of these patients and, ultimately, to poorer outcomes. Recently, lung cancer patients and advocates have become increasingly concerned about possible disparities in treatment compared with non–self-induced malignancies.

It is also unclear whether perceived poor survival or ineffective treatments might play a role in treatment bias regarding lung cancer. Although the outcome for advanced lung cancer remains grave in comparison with some malignancies, multiple studies have shown significant advances during recent years in treatment and symptom management. This has resulted in improved quality of life and in longer survival for these patients. Nevertheless, a lack of knowledge in physicians was suggested in a survey study, which showed that almost 40% of primary physicians recommended only supportive and palliative care for patients with advanced-stage lung cancer (stage IV), even though multiple studies have shown that these patients can benefit significantly from chemotherapy.
We hypothesized that primary care physicians approach the treatment and referral of lung cancer patients differently than they do patients with other malignancies, such as breast cancer, possibly because of factors such as stigma relating to patients’ use of tobacco, the number of lung cancer patients in the physicians’ practice, or a lack of knowledge regarding the advances in therapy for lung cancer.

METHODS

Participants

A cover letter and case scenarios were sent to all 1132 Wisconsin physicians who were identified as members of the American College of Physicians–Internal Medicine and the American Academy of Family Physicians through their respective directories. The study protocol was approved by the institutional review board at the University of Wisconsin.

Questionnaire

The questionnaires were initially developed by one of us (J.S.) and then revised on the basis of the evaluation and comments of the remaining authors and a small group of medical oncologists. The surveys were then distributed a pilot group of internal medicine physicians at the University of Wisconsin to help gauge the effectiveness and clarity of the survey. The questionnaires were developed with the primary goal of evaluating how primary physicians approach the management and referral of patients with two different malignancies—breast and lung cancer—but with the same stage of disease. The questionnaires included patients’ scenarios from their presentation with stage IB disease through primary treatment, to the development of metastatic disease, and, eventually, to end-of-life care. In addition, the cases were further subdivided into patients with both breast and lung cancer who did or did not use tobacco. This resulted in the development of four different surveys, two with scenarios of nonsmoking patients with breast and lung cancer and two with smoking patients with breast and lung cancer. The surveys were identical in every way, with the exception of tumor type and smoking status. A sample version of the questionnaire can be seen in Appendix A.

Briefly, each of the survey questionnaires consisted of three sections. The first section contained questions about physician demographics and basic characteristics about the physicians, and the second section contained the clinical scenarios. The final section of the survey asked physicians what specific factors influenced their decision to refer patients to a medical oncologist, including type of cancer, stage of disease, degree of symptoms, patients’ desire, and age of the patient; a respondent also could fill in his or her own reasons.

Study Design

A total of 1132 primary care physicians were randomized into four equal groups of 283 that received one of the following questionnaires: (a) a female smoker/lung cancer scenario, (b) a female nonsmoker/lung cancer scenario, (c) a female smoker/breast cancer scenario, and (d) a female nonsmoker/breast cancer scenario. Physicians were surveyed with an initial mailing in April, 2005, and then with a repeat mailing in August 2005. The physicians had an option of filling out and returning the paper copy of the survey, or they could access an electronic copy of the survey on Zoomerang using a URL provided in the cover letter. All surveys returned by October 31, 2005 were included in the study. It was anticipated that the response rate of the questionnaires would be at least 30%. The sample size was chosen to detect differences of at least 25% in the response patterns between disease groups with 80% power to a two-sided significance level of 5%.

Statistical Analysis

Categorical data were summarized as frequencies and percentages. All quantitative data were summarized by medians and ranges. Response patterns between disease/smoking status groups were performed using a Mantel–Haenszel test. Pairwise comparisons between disease or smoking status groups were performed using a $\chi^2$ test or Fisher’s exact test whenever appropriate. Comparisons between disease or smoking status groups of continuous outcomes were performed using a nonparametric Wilcoxon rank-sum test. All statistical tests were two sided, and $p < 0.05$ was used to indicate statistical significance. Statistical analyses were performed using SAS version 6.12 software (SAS Institute, Cary, NC).

RESULTS

Physician Characteristics and Response Rates

A total of 672 of 1132 physicians (59.4%) returned their surveys. Briefly, the median age of the physicians was 46 years old, with approximately 65% of the participants being male. The physicians had been in practice a median of 15 years and saw, on average, 77 to 80 patients per week. The physicians stated that they saw approximately seven breast cancer patients and four lung cancer patients per year. There were no significant differences in the evaluated characteristics between the two groups. Table 1 shows the characteristics of the physicians who participated in the study.

Referral Patterns

The survey was designed so that three of the questions concerned the physician’s choice on whether to refer the patient to a clinical oncologist. The first question posed a scenario for a newly diagnosed female patient with stage IB lung or breast cancer. Of the 672 physicians, 656 (97.6%) stated that they would refer their patients to a clinical oncologist for possible further treatment after surgical intervention. There was no difference between physicians who received scenarios with breast cancer patients and those who received scenarios with lung cancer patients ($p = 0.857$).

Nevertheless, when the patients were found to have metastatic disease, physicians were less likely to refer lung cancer patients than breast cancer patients to oncologists for possible further treatment (Figure 1). In this scenario, the breast and lung cancer patients both were described as having proven hepatic and lung metastasis, but otherwise they felt well, had good performance status, and were able to perform their daily activities. Only 308 of 318 physicians would refer a lung cancer patient for further therapy, compared with 345
of 345 physicians who said they would refer a breast cancer patient (97% versus 100%, \( p < 0.001 \)). Later in the questionnaire, physicians were asked about referral practices in patients with metastatic disease who had poor performance status. Again, more physicians stated they would refer breast cancer patients, but not lung cancer patients, to medical oncologists (34% versus 20%, \( p < 0.001 \)).

Two additional questions evaluated why physicians refer patients with metastatic disease to oncologists. More physicians stated that they would refer their advanced-stage lung cancer patients solely for supportive or palliative care compared with breast cancer patients, whom they would refer for further treatment (9% versus 3%, \( p = 0.0092 \)). In addition, more physicians stated that the stage of disease affected their choice to refer to an oncologist in breast cancer compared with lung cancer (\( p < 0.001 \)). Nevertheless, when asked directly at the end of the survey in a true/false question, physicians did not state that the type of malignancy (\( p = 0.185 \)), degree of the patient’s symptoms (\( p = 0.115 \)), the patient’s desire for a referral (\( p = 0.496 \)), the patient’s age (\( p = 0.258 \)), the presence of comorbid medical conditions (\( p = 0.38 \)), or the distance to travel for the referral (\( p = 0.235 \)) impacted their decisions to refer patients to oncologists (Table 2).

### Influence of Tobacco Use

A secondary endpoint of our study was to determine whether patients’ tobacco use influenced the physicians’ care decisions. We found no significant differences in response to any of the questions in the clinical scenarios between any of the smoking and nonsmoking groups. Physicians noted they would refer similar percentages of smoking and nonsmoking patients with malignancies to oncologists, both in the setting of early-stage (98% versus 97%, \( p = 0.31 \)) and metastatic disease (99% versus 98%, \( p = 0.49 \)). The physicians also were asked directly about factors that would influence their decisions to refer these patients; according to their responses to this question, patients’ tobacco use did not significantly influence their decisions (Table 2).

### Benefit of Therapy

An additional aim of this study was to determine the awareness among primary physicians of new therapeutic options for lung cancer. The first part of the clinical scenario dealt with newly diagnosed cancer patients with stage IB disease. Fewer physicians knew that adjuvant therapy benefited lung cancer patients compared with breast cancer patients (11% versus 24%, \( p = 0.001 \)) (Figure 2). Later in the survey, the questions referred to patients with metastatic cancer who were otherwise asymptomatic. Compared with their knowledge of breast cancer treatment, fewer physicians knew that the treatment of advanced-stage lung cancer had a survival benefit (41% versus 31%, \( p = 0.0145 \)) (Figure 2).

### Patient Follow-up

The length of follow-up also was evaluated in patients with advanced-stage malignancies who were in severe pain. Physicians were asked whether they would see these patients in 1 to 2 weeks, 1 to 2 months, or refer them to hospice for pain control. More physicians stated that they would continue to observe their patients with breast cancer every 1 to 2 weeks as opposed to their lung cancer patients (77% versus 70%, \( p = 0.0256 \)) (Figure 3). In addition, there was no significant difference between the number of breast cancer and lung cancer patients with poor performance status and metastatic disease who were referred to hospice for end-of-life care (91% versus 87%, \( p = 0.11 \)).
Number of Patients in the Physicians’ Practice
The numbers of patients with breast cancer and with lung cancer in the physicians’ practice during the previous 12 months were evaluated to determine whether the physicians’ experience treating the disease impacted their care decisions. There was no statistical difference in referral patterns for physicians who had more than or fewer than four patients with breast or lung cancer in their practice during the previous year for early-stage disease (98% versus 97%, respectively, \(p = 0.56\)), advanced-stage disease (98% versus 99%, \(p = 0.10\)), or for the management of symptoms (95% versus 93%, \(p = 0.13\)).

Physician Age
The age of each participating physician also was examined as a possible reflection of a physician’s knowledge about recent advances in treatments for lung cancer, with the assumption that younger physicians might be more acquainted with the recent literature. The median age of the physicians was 47 years old. The physicians were grouped into those above and below the mean, and their responses regarding patient treatment and referral (both in the settings of early-stage and advanced disease) and symptom-control management were evaluated. The age of a physician did not impact his or her referral practices for patients with early- or advanced-stage disease (98% for younger versus 97% for older physicians \(p = 0.43\) and 99% for younger versus 98% for older physicians \(p = 0.20\), respectively) or their practice of symptom management in these patients (76% for younger versus 71% for older physicians, \(p = 0.13\)).

Physician Gender
The gender of each participating physician was evaluated to determine whether it influenced the physicians’ treatment decisions. There was no statistical difference observed in the referral patterns for male versus female physicians for early-stage disease (98% versus 98% respectively, \(p = 0.96\)), advanced-stage disease (98% versus 99%, \(p = 0.10\)), or for the management of symptoms (96% versus 93%, \(p = 0.06\)).

DISCUSSION
The surveyed physicians in this study clearly have shown a preference toward more aggressive referral patterns in patients with metastatic breast cancer than in patients with metastatic lung cancer. In addition, when lung cancer patients were referred to medical oncologists, it was more often for palliative care and symptom management only. In contrast, breast cancer patients often were referred for evaluation for possible treatment options, regardless of whether they had localized or advanced-stage disease.
It is important to know the expected survival for all stages of the two diseases, to understand how effective therapy may be in either case. Early-stage breast cancer (stage I or II) has an excellent 5-year survival rate of approximately 76% to 98%, and it often can be cured with aggressive treatment. Nevertheless, although the 5-year survival rate is approximately 16% in untreated metastatic breast cancer, there has been an improvement in the median survival from 18 months to 26 months during the past 20 years, with the development of newer chemotherapeutics.

Improvements in survival also have been observed in the treatment of lung cancer. Recent studies have clearly demonstrated that adjuvant therapy for early-stage non-small cell lung cancer (NSCLC) (IB, II, and IIIA) improves survival, underlining the importance of aggressive chemotherapy after surgical intervention.8,13–15 The improvement in survival from chemotherapy is not limited to patients with early-stage NSCLC. Patients with advanced-stage NSCLC also have seen improvements in survival during recent years, with improvements in median 1-year survival from 10% untreated to 30% with doublet chemotherapy.9 In certain subpopulations of NSCLC, the median survival of patients treated with chemotherapy plus bevacizumab, a monoclonal antibody to vascular endothelial growth factor, is more than 50%.16

It is unclear why primary care physicians in this study reported that they were more likely to refer advanced breast cancer patients than advanced lung cancer patients for treatment. When asked directly, physicians denied that the type of malignancy or the degree of a patient’s symptoms influenced the decision to refer the patient. Nevertheless, when the physicians responded to the case scenarios, it was observed that the type of malignancy, stage of disease, and degree of patient symptoms did indeed influence the physicians’ decisions to refer their patients. Of note, physicians observing breast cancer patients for severe pain were likely to see them at more frequent intervals than were those observing lung cancer patients. The reason for this discrepancy is unclear, but it was not attributable to a larger number of lung cancer patients being referred for hospice care, because there was not a significant difference in the percentage of patients referred to hospice between the groups.

One possibility may be an unconscious bias induced by the stigma of lung cancer being a “self-induced” disease. Nevertheless, physicians were as likely to refer stage IB breast cancer patients for further therapy after surgery as they were to refer stage IB lung cancer patients. In addition, the cancer patients’ history of tobacco use did not seem to have any influence on the physicians’ care decisions. This brings into question the possibility that the differences observed in this study are related to the stigma of a self-induced disease. It is possible that some physicians taking the survey simply failed to recognize the smoking status of the patient in their questionnaire. It is also possible that the stigma is not associated with tobacco use but, rather, with the actual disease itself. Primary physicians may have felt that the poor prognosis of lung cancer compared with breast cancer warranted a less aggressive approach. In any event, this was an interesting finding in the study, and it deserves to be tested further in the future.

Another reason might be differences in the physicians’ knowledge base regarding the benefits of both adjuvant and “salvage” therapy for NSCLC. As discussed above, the advances in the treatment of NSCLC in both early-stage and metastatic disease have been relatively recent, and they might not be widely known or accepted. This is important because patients cannot benefit from advances in therapy if they are evaluated by physicians who not are aware of these advances. A previous study by Earle et al.17 has shown that patterns of care, particularly in the delivery of chemotherapy, were driven by whether the patient did or did not see an oncologist.

One possibility is that the lack of knowledge regarding lung cancer treatment and prognosis might be secondary to a lack of experience in the care of lung cancer patients. Nevertheless, when physicians were grouped by whether they saw many (more than four) or relatively few (no more than four) lung and breast cancer patients during the previous 12 months, there was no significant difference in their referral and treatment decisions. We also evaluated this possibility by assessing the age of each physician, assuming that a younger age might imply more knowledge of the recent advances in lung cancer. Nevertheless, no difference related to the physicians’ ages was seen in the care of patients with either malignancy. Regardless of the cause, improvements in physicians’ knowledge about advances in the treatment of NSCLC would, presumably, change their referral patterns or treatment decisions, thus resulting in improved outcomes.

An interesting note is that although the participating physicians were relatively unaware of the benefits of chemotherapy for patients with early- and advanced-stage lung cancer, the percentage of physicians who said that they knew the benefits of chemotherapy for early- and advanced-stage breast cancer (24% and 41%, respectively), although higher, were also markedly low. The reason for this is unclear, but it is likely related to many of the same factors that have been described above (i.e., knowledge about advancements in therapy, number of breast cancer patients seen, etc.). It would be interesting to further evaluate this finding in a study targeted towards physicians treating breast cancer patients.

Some limitations of the study must be acknowledged. First, because the group of physicians surveyed in this study was a convenience sample taken from a single state, they might not be representative of primary care physicians throughout the country; this might limit generalization of the results. Second, there may be a nonresponse bias, because approximately 41% of the physicians asked to participate in the study did not return their surveys, and their responses may have differed from those of our participant population. A third limitation, inherent to survey studies, is that sources of error can result from the wording of the survey questions, which may cause participants to interpret the same question differently.18 Fourth, the study was designed to detect only absolute differences of 25% or greater between groups; thus, small but potentially significant differences regarding all of the above factors might have been missed. Finally, it is important to again point out that we measured physicians’
self-reports of their practice and not of their actual practice patterns, which may be different.

Regardless of these possible limitations, this study demonstrates a difference in referral patterns between advanced breast cancer and lung cancer patients, and this difference might be attributable to many potential factors, such as a knowledge gap regarding advancements in cancer therapy, or, possibly, the existence of a subconscious bias against lung cancer patients. Thus, it will be important to identify the potential factors involved to ensure that lung cancer patients are benefiting from recent advances in chemotherapy. Specific studies designed to educate primary physicians on the recent improvements in the therapies for NSCLC, both in early- and advanced-stage disease, are needed to determine whether improved knowledge would lead to a change in their referral patterns and, ultimately, to improvements in overall patient survival.

REFERENCES

APPENDIX A

We are conducting a study to determine how primary care providers approach the management of patients with common malignancies, and would appreciate it if you would answer some questions for us. Your answers will be confidential and anonymous. Please do NOT put your name on this survey. Thanks!

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Approximately how many patients do you see per week? ___

In the past 12 months, about how many patients did you see:

- With breast cancer? number
- With lung cancer? number

SECTION II

One year later, the patient has developed anorexia and weight loss, and is found to have biopsy proven hepatic and lung metastases. She is otherwise feeling relatively well, and continues to work full time as an accountant. She comes to you again to talk about what to do next.

Question 5: You:

a. Refer her to a medical oncologist (GO TO QUESTION 6 BELOW)
b. Do not refer her to a medical oncologist (SKIP QUESTION 6, AND GO TO QUESTION 7 BELOW)

c. Both (GO TO QUESTION 8 BELOW)

Question 6: The reason you refer her to a medical oncologist is:

a. Possible treatment (GO TO QUESTION 8 BELOW)
b. Management and control of symptoms (SKIP THE NEXT TWO QUESTIONS, AND GO DIRECTLY TO SECTION III ON THE NEXT PAGE)
c. Both (GO TO QUESTION 8 BELOW)

Question 7: The reason you do not refer her to a medical oncologist is:

a. There is no effective treatment for this disease. (GO TO DIRECTLY TO SECTION III ON THE NEXT PAGE)
b. Although there is treatment for metastatic lung cancer, it is not very effective, and the benefits do not outweigh side effects of treatment (GO DIRECTLY TO SECTION III ON THE NEXT PAGE)

Question 8: The possible benefits of treatment of metastatic lung cancer are: (CIRCLE AS MANY AS APPROPRIATE)

- Improved survival
e. Palliation of symptoms

SECTION III (CIRCLE AS MANY AS APPROPRIATE)

Nine months later, the patient returns in considerable pain secondary to liver metastases. She is doing poorly, with significant fatigue, weakness, and anorexia, and is losing weight rapidly. Her pain is poorly controlled (rated an 8-9 out of 10) on one Vicodin every 6 hours, and she looks uncomfortable.

Question 9 (Circle as many as appropriate): Regarding her pain management, you:

a. Increase her Vicodin to two tablets every 5 hours as needed
b. Start her on a long acting pain medication
c. Admit her for pain control
d. Other: ___

Question 10 (Circle as many as appropriate): Regarding her follow-up, you:

a. Plan on seeing her back again in one to two months
b. Plan on seeing her back again in one to two weeks
c. Refer her to a medical oncologist for possible treatment
d. Refer her to Hospice for management of end-of-life issues, and plan on assisting in her management
e. Refer her to a medical oncologist for end-of-life care

What factors most influence your decision to refer (or not) to an oncology specialist? Please rate the factors below using the following rating scale:

1 = Extremely important in my decision-making about referral
2 = Very important
3 = Somewhat Important
4 = Not too important
5 = Not at all important in my decision-making about referral

Evaluate the factors below:

Type of cancer
Stage of cancer
Symptoms from the cancer
Patient’s desire or reluctance to be referred
Patient’s age
Level of comorbid factors
Lack of specialist doctors available
Logistic reasons (patient inconvenience, distance to travel)
Other (Specify ___)

THANK YOU FOR COMPLETING THIS SURVEY. PLEASE DO NOT PUT YOUR NAME ON THIS SURVEY.