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Patients' Perspectives on Integrating Acupuncture into the Radiation Oncology Setting

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Abstract

Introduction—Acupuncture has potential as a supportive care service for cancer symptom management. However, little is known about patients' willingness to use acupuncture in the context of conventional cancer care.

Methodology—We conducted a cross-sectional survey study among patients with cancer during their last week of fractionated/external beam radiotherapy (RT). The main outcome variable was self-reported likelihood of using acupuncture during RT. Knowledge about acupuncture and pain

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severity was measured along with socio-demographic and clinical variables. Multivariate logistic regression was performed to identify factors associated with willingness to use acupuncture.

Results—Among the 305 participants, 79 (26.4%) were likely to use acupuncture during RT if such services were offered at a reasonable price, 143 (46.9%) had no knowledge of acupuncture, and 206 (67.6%) reported having pain. In multivariate analyses, non-Whites (adjusted odds ratio [AOR] 1.94, 95% Confidence Interval [CI] 1.06–3.56), and those with pain (AOR 2.52, CI 1.25–5.10) were more interested in using acupuncture. In addition, patients with preexisting knowledge about acupuncture were also more likely to use acupuncture than those without this knowledge (AOR 2.23, CI 1.28–3.88).

Conclusions—Patients of non-White race, those with pain or those with prior knowledge about acupuncture were more willing to utilize acupuncture during RT. Since half of the patients had no knowledge about acupuncture, interventions to improve patients' knowledge are needed to facilitate the successful integration of acupuncture into cancer care.

Keywords

Acupuncture; radiotherapy; pain; health disparity; knowledge; CAM

INTRODUCTION

Annually, approximately 3.2 million people in Europe and 1.6 million people in the United States are diagnosed with cancer, and depending on their diagnoses and prognoses, roughly 50% will receive radiotherapy (RT) as part of their treatment [1–3]. While RT can significantly improve cancer-related outcomes, the benefits can be accompanied by substantial toxicities including xerostomia, nausea, pain, and fatigue, all of which negatively impact patient quality of life [4–10]. To address these symptoms, many RT patients turn to Complementary and Alternative Medicine (CAM). A recent cross-sectional study demonstrated that 68% of patients receiving RT used CAM, with a majority of patients citing perceived benefits such as improved energy and overall health [11].

Acupuncture, an ancient CAM modality, involves the use of thin sterile needles placed at specific points on the body. Traditionally, acupuncture was believed to promote energy flow and enhance wellbeing; basic science research suggests that acupuncture may affect cognition and emotional and pain processing [12]. Although acupuncture's mechanism of action is still not fully understood, emerging evidence suggests that it may be effective in reducing several cancer-related symptoms commonly seen in patients undergoing RT (i.e. fatigue [13], pain [14], nausea [15], and xerostomia [16]).

Despite the potential benefits of acupuncture, it is estimated that fewer than 5%–10% of cancer patients currently use acupuncture for symptom management [17, 18]. Since radiation oncology patients can experience a high symptom burden, with up to 28% of patients suffering from nausea or vomiting depending on the body site of treatment, and a high percentage of patients irradiated for head or neck cancer experiencing some severity of xerostomia, the role of acupuncture in symptom management in the RT setting is particularly relevant [5, 7, 19]. An understanding of patients' willingness to use acupuncture

in the RT setting is important for several reasons. First, this understanding can enable cancer centers and clinics to plan integrative acupuncture services with appropriate staffing to meet patients' needs. Second, as preliminary evidence emerges in support of acupuncture in an RT setting, the need for larger-scale randomized control trials also grows. Understanding whether patients are receptive to acupuncture may enable researchers to plan for effective recruitment strategies. Thus, the specific aims of this study are to: 1) quantify the proportion of patients who would be likely to use acupuncture in the RT setting if such a service were available; and 2) identify the factors (i.e. socio-demographic, clinical, and previous knowledge) related to patient-reported willingness to use acupuncture in the RT setting.

MATERIALS AND METHODS

Study Population

We administered a cross-sectional survey study in the Radiation Oncology Department of the Hospital of the University of Pennsylvania (Philadelphia, PA). Potential participants included patients aged 18 or older who were receiving RT in an outpatient setting for a primary diagnosis of cancer, who were more than 14 days postoperative, and who had a Karnofsky functional score of 60 or greater. Patients were excluded from the study if they were receiving palliative RT, had been previously diagnosed with a brain tumor, were experiencing abnormal neurological function, or were unable to comprehend the requirements of the study and provide informed consent.

Ethical Approval

Both the University of Pennsylvania Institutional Review Board and the Abramson Comprehensive Cancer Center Scientific Review and Monitoring Committee approved this study. After obtaining permission from the treating radiation oncologists, research assistants screened medical records and approached eligible patients during their last week of radiation treatment visits. Once patients consented, they were given a self-administered survey.

Measurements

We assessed the primary outcome, a patient's likelihood of using acupuncture, with the following question: "How likely is it that you would have utilized acupuncture if it was available to you at a reasonable price?" and measured responses on a five-point Likert scale ranging from very unlikely to very likely. For analysis, responses were dichotomized with likely and very likely considered an affirmation of potential usage.

Patients self reported socio-demographic factors: age, sex, race/ethnicity, marital status and education. We dichotomized race into White vs. Non-White to ensure adequate numbers for analyses. Clinical factors including cancer type, stage, and treatment course were collected by chart abstraction. Pain was measured using the validated Brief Pain Inventory (BPI) [20]; responses to the worst pain item were categorized as no pain (0), mild pain (1–4), and moderate/severe pain (5–10). Since the literature suggests that there may be a relationship between perceived knowledge and CAM use [21], we evaluated patients' knowledge about acupuncture using the following item: "How knowledgeable are you about acupuncture?" and responses were measured on a three-point Likert scale of, "Not Knowledgeable,

Somewhat Knowledgeable, or Knowledgeable.” For analysis, responses to this item were dichotomized into patients with no knowledge and patients with knowledge about acupuncture.

Analyses

All analyses were performed using STATA 12.0 (StataCorp, College Station, TX). Demographic and clinical variables as well as study outcomes were summarized and reported using standard descriptive statistics. Chi-squared analyses were performed to evaluate the relationships between patient characteristics and the dichotomous outcome of likelihood to use acupuncture. Demographics and clinical variables associated with acupuncture use at an alpha less than 0.1 were incorporated into the multivariate logistic regression models. Two multivariate models were generated because gender and cancer type were mutually exclusive in specific categories of our sample population (e.g. prostate cancer only affected male participants). All analyses were two-sided, and an alpha less than 0.05 was considered statistically significant.

RESULTS

Between July 2009 and July 2010, 380 patients were approached for enrollment and 324 (85.3%) agreed to participate. Among the 56 (14.7%) who declined, the main reasons were: 47 (12.4%) did not want to participate in research and 9 (2.4%) reported feeling too sick on the day of the survey. Nine subjects withdrew consent and 10 did not return a completed survey questionnaire, resulting in the final sample of 305 patients, and a final response rate of 80.3%.

Study Population Demographics and Outcomes

Demographic and clinical characteristics of the study population are presented in Tables 1 and 2. The 305 participants were aged from 18 to 87 years (mean 59.8, SD 12.0). One hundred sixty (52.5%) patients were male; 231 (75.7%) were White, and 74 (24.3%) were non-White (19.7% were Black/African-American, 2.6% Asian, 0.7% Hispanic/Latino, and 1.3% reported “Other”). Sixty patients (19.7%) were diagnosed with breast cancer, 54 (17.7%) with prostate cancer, 55 (18.0%) with head and neck cancer, 46 (15.1%) with gastrointestinal cancer, 41 (13.4%) with lung cancer, and 49 (16.1%) with another type of cancer.

Among the participants, 79 (26.4%) said they would be likely to use acupuncture if offered the service at a reasonable price and 143 (46.9%) stated that they had no knowledge of acupuncture. Two hundred and six (67.5%) participants experienced pain during RT with 75 (24.6%) reporting moderate or severe pain.

In the unadjusted analysis (Tables 1 and 2), we found that non-Whites were more likely to be willing to use acupuncture (37.5% vs. 22.9%, $p=0.014$). Among patients with different cancer types, likeliness to use acupuncture was highest in those with breast (38.3%) and lowest in prostate (17.0%), with other tumors in between ($p=0.062$). Patients with mild or moderate/severe pain were more likely to use acupuncture than those without pain (30.2%, 33.2% vs. 14.9% respectively, $p=0.010$). Those with any knowledge of acupuncture were

also more likely to use acupuncture than those without knowledge (33.8% vs. 18.3%, $p=0.002$).

Adjusting for gender and other covariates, we found that non-Whites (adjusted odds ratio [AOR] 1.94, 95% Confidence Interval [CI] 1.06–3.56) and those with some level of pain (mild pain: AOR 2.52, CI 1.25–5.10; moderate/severe pain AOR 2.65 CI 1.23–5.72) were more likely to report that they would use acupuncture. In addition, prior knowledge of acupuncture was also positively associated with patients' reported willingness to use acupuncture (AOR 2.23, CI 1.28–3.88). The model including cancer type confirmed these results, and also indicated that prostate cancer patients were less likely than breast cancer patients to utilize acupuncture (AOR 0.33, CI 0.13–0.86), see Table 3.

DISCUSSION

Cancer patients undergoing radiotherapy experience a substantial symptom burden that negatively impacts quality of life. To address these symptoms, many patients turn to CAM [11]. Our study demonstrated that among 305 radiotherapy outpatients, 79 (26.4%) reported willingness to integrate acupuncture in their RT care if offered the service at a reasonable price. This finding is important because acupuncture is currently being used by only 5% to 10% of cancer patients [17], and emerging literature suggests that acupuncture may help patients alleviate symptoms commonly found during RT, such as pain, nausea, fatigue, and xerostomia [13–16].

Our study found that 26.4% of RT patients are willing to use acupuncture; this rate reflects the patient reported utilization rates of the most common supportive care services in the oncology setting (nutrition 26.5%; psychiatry/psychological counseling 29.7%) [22]. This level of acceptance indicates that a demand exists from patients to incorporate acupuncture into the conventional care setting, and the other results suggest that programs addressing knowledge gaps may increase patient uptake. As patients attend radiotherapy visits daily, integration of acupuncture in the same setting may provide a logistically feasible and convenient environment for patients where both curative and supportive care can occur simultaneously. Patients will not have to travel to multiple locations to receive care. Additionally, current acupuncture clinical trials in an RT setting are often small and underpowered [23]; the development of integrative acupuncture service may support larger scale translational, clinical, and outcome research that will ultimately help inform evidence-based integration of acupuncture into the RT setting.

Our study also found that almost half of the patients had no knowledge of acupuncture, and that any knowledge of acupuncture was associated with twice the likelihood of willingness to use acupuncture. As more evidence emerges regarding the use of acupuncture in the oncology setting [16, 24], it is critically important to disseminate such knowledge to patients and providers because there is a correlation between the degree to which patients are informed and their use of CAM [21]. With this information, patients and providers can make informed decisions about incorporating acupuncture into care with the goals of managing symptoms and improving quality of life.

One study also indicates that acupuncture may play an important role in meeting the unmet symptom management needs of patients undergoing RT, especially for minority populations. The majority of the minority patients were African Americans. Literature suggests African American patients with cancer tend to have greater pain and symptom distress than their White counterparts [25–27]. The existing literature also suggests patients with unmet symptom needs are more likely to use CAM [28]. In this study, we found that patients experiencing pain during the last week of RT were almost twice as willing to use acupuncture as their counterparts without pain. Non-White race was also positively associated with willingness to use acupuncture. Thus, acupuncture may have the potential to address symptom management disparities in cancer care. Future research needs to be conducted to understand what attitudes and beliefs are behind the preference for using acupuncture in symptom management. Furthermore, clinical acupuncture trials should include sufficient minority samples so that the results can be generalized to the population in need.

This study had several limitations: first, selection bias may have existed, although this was minimized by an overall response rate of 80.3%. Second, we evaluated “likely to use” rather than actual use. In addition, it is possible that “reasonable price” may mean different things for people in different socio-economic classes. Thus, future studies need to investigate how price structure may influence both intended and actual use of acupuncture. For example, if patients were offered a set amount of free acupuncture sessions, as is often the case for other supportive services such as nutrition and general counseling, patient demand for acupuncture might be significantly higher. Lastly, this study was conducted in an urban, academic medical center in the United States, which may limit its generalizability to community settings and in Europe. However, to our knowledge, currently no Westernized healthcare system reimburses acupuncture payments in the cancer setting, and so to this extent, our findings are still generalizable.

CONCLUSIONS

Despite its limitations, this study is the first to assess the rate of and factors associated with cancer patients’ willingness to integrate acupuncture into their radiation oncology care. Capturing a diverse group of participants, the study demonstrates a demand among RT patients for acupuncture that is comparable to other types of supportive care services (e.g. nutrition 26.5%; psychiatry/psychological counseling 29.7%) [22]. Appropriate integration of acupuncture in cancer care may further broaden the therapeutic options for patients and their health care providers. By considering factors such as knowledge, race, and pain, our study lays the foundation for future research to evaluate how to integrate acupuncture to address unmet symptom needs for diverse populations. Ultimately, with rigorous research and innovative clinical programs, acupuncture may become part of integrative supportive care for patients undergoing radiotherapy.

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Table 1

Demographics of Participants by Patients' Likelihood of Using Acupuncture (N=305)

Demographics Variables	No. Participated (% of Total)	No. Likely to Use Acupuncture	% [†]	P-value [‡]
Total	305 (100%)	79	26.4	
Age:				0.267
<55	92 (30.2)	28	30.4	
55–65	118 (38.7)	32	28.1	
>65	95 (31.2)	19	20.4	
Sex:				0.049
Male	160 (52.5)	34	21.7	
Female	145 (47.5)	45	31.7	
Race/Ethnicity:				0.014
White	231 (75.7)	52	22.9	
Non-White [*]	74 (24.3)	27	37.5	
Education Attainment:				0.820
High school or less	88 (28.9)	21	24.7	
Some college or technical school	150 (49.2)	39	26.2	
College or more advanced	67 (22.0)	19	29.2	
Employment Status:				0.178
Not currently employed	157 (51.5)	45	29.4	
Employed part of full-time	140 (45.9)	31	22.5	
Marital Status:				0.622
Not currently married	106 (34.8)	29	28.2	
Married/partnered	199 (65.3)	50	23.5	

^{*} Non-White*: 19.7% Black/African American, 2.6% Asian, 0.7% Hispanic/Latino, and 1.3% reported "Other"

%[†]: Meaning Percent of Patients Reporting Likelihood of Using Acupuncture in a Specific Demographic Category

P-value[‡]: Based on Chi-Square Test

Table 2

Clinical Characteristics of Participants by Patients' Likelihood of Using Acupuncture (N=305)

Clinical Variables	No. Participated (% of Total)	No. likely to use acupuncture	% †	P-value ‡
Total	305 (100%)	79	26.4	
BMI:				0.918
Normal (<24.9)	120 (39.3)	29	25.2	
Overweight (25–29.9)	106 (34.8)	28	26.7	
Obese (≥30)	79 (25.9)	22	27.9	
Cancer Type				0.062
Breast	60 (19.7)	23	38.3	
Prostate	54 (17.7)	9	17.0	
Head and Neck	55 (18.0)	18	32.7	
Gastrointestinal	46 (15.1)	9	20.5	
Lung	41 (13.4)	11	29.0	
GU/Skin/Other	49 (16.1)	9	18.4	
Cancer Stage				0.967
Stage I	73 (23.9)	20	27.4	
Stage II	73 (23.9)	18	25.0	
Stage III	77 (25.3)	19	25.7	
Stage IV	58 (19.0)	16	28.6	
Surgery				0.694
No	152 (49.8)	38	25.5	
Yes	152 (49.8)	41	27.5	
Chemotherapy				0.143
No	145 (47.5)	32	22.4	
Yes	158 (51.8)	46	29.9	
Pain				0.010
No pain	96 (31.5)	14	14.9	
Mild pain	131 (43.0)	39	30.2	
Moderate/Severe pain	75 (24.6)	25	33.3	
Knowledge about acupuncture				0.002
Have no knowledge	143 (46.9)	26	18.3	
Have knowledge	159 (52.1)	53	33.8	

Abbreviations: BMI - Body Mass Index

% †: Meaning Percent of Patients Reporting Likelihood of Using Acupuncture in a Specific Demographic Category

P-value ‡: Based on Chi-Square Test

Table 3
Factors Associated with Patients' Likelihood of Using Acupuncture in Radiation Oncology

Demographic and Clinical Variables	Logistic Model 1			Logistic Model 2		
	Univariate Analysis			Multivariate Analysis		
	OR	95% CI	P-value	AOR	95% CI	P-value
Gender:						
Male (<i>reference</i>)						
Female	1.68	1.00–2.82	0.05	1.50	.86–2.60	0.152
Race:						
White (<i>reference</i>)						
Non-White *	2.02	1.14–3.57	0.015	1.94	1.06–3.56	0.031
BPI Severity:						
No pain (0), (<i>reference</i>)						
Mild pain (1–4)	2.48	1.25–4.89	0.009	2.52	1.25–5.10	0.010
Moderate/Severe pain (5–10)	2.86	1.36–6.01	0.006	2.65	1.23–5.72	0.000
Knowledge Acupuncture:						
Not knowledgeable (<i>reference</i>)						
Knowledgeable†	2.27	1.33–3.90	0.003	2.23	1.28–3.88	0.005
Cancer Type:						
Breast (<i>reference</i>)						
Prostate	0.33	.14–.80	0.014	0.33	.13–.86	0.023
Head/Neck	0.78	.36–1.68	0.53	0.81	.36–1.85	0.623
Gastrointestinal	0.41	.17–1.02	0.054	0.50	.19–1.29	0.150
Lung	0.66	.27–1.57	0.34	0.86	.33–2.20	0.750
GU/Skin/Other	0.36	.15–.88	0.025	0.48	.19–1.22	0.120

Abbreviations: OR - Odds Ratio; CI - Confidence Interval; AOR - Adjusted Odds Ratio, BPI - Brief Pain Inventory

* Non-white*: 19.7% Black/African American, 2.6% Asia, .7% Hispanic/Latino, and 1.3% reported "Other"

Knowledgeable †: Patient Responded Either "Somewhat Knowledgeable" or "Knowledgeable"