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Does age influence the symptom experience of lung cancer patients prior to surgery?

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ABSTRACT

Objectives: Older patients with lung cancer are less likely to be offered surgery then younger patients. Although higher preoperative symptom burden is associated with poorer postoperative outcomes, few studies have examined age-related differences in symptom experience of lung cancer patients prior to surgery. This study evaluated for differences in symptom occurrence, severity, and distress between older (≥65 years) and younger (<65 years) patients prior to surgery.
Materials and methods: Data were collected through chart review and a symptom assessment scale (i.e., Memorial Symptom Assessment Scale (MSAS)) that evaluated multiple dimensions of 32 symptoms. Descriptive statistics were used to present demographic and clinical characteristics of the sample. Logistic regression analyses were used to evaluate for age-related differences in each dimension of the symptom experience.
Results: A total of 270 patients completed the MSAS prior to surgery (113 younger and 157 older patients). Few age-related differences were found. When age differences were identified, older patients reported lower occurrence rates and lower severity and distress ratings. Cough, lack of energy, feeling drowsy and worrying was the four most common symptoms in both age groups. In the younger patients, feeling nervous was ranked fourth. Shortness of breath was ranked third by the older patients. The study confirmed the high occurrence rates for cough, pain, fatigue, shortness of breath, and sleep disturbance found in previous studies. However, "new" symptoms were identified including feeling nervous, worrying, sweats, feeling bloated, and problems with sexual interest. These "new" symptoms were reported by over 40% of the patients.
Conclusions: Measurement of symptoms in lung cancer patients before surgery is important, because patients reported an average of 10 symptoms. Few age-related differences in the patients' symptom experience were identified. Psychological symptoms were common and warrant consideration.

1. Introduction

Lung cancer is the leading cause of cancer deaths in patients over 70 years in Western countries [1]. Surgical resection is considered the treatment of choice for patients with early stage, non-small cell lung cancer [2]. However, older patients with lung cancer are less likely to be offered surgery [1,3,4], even though long term survival rates for older and younger patients are comparable [3,5]. Over the past decade, studies have focused on how preoperative assessment of elderly oncology patients influences postoperative complication rates and overall survival [1,4,6–8]. In these studies, emphasis was placed on an evaluation of comorbidities, cancer characteristics, nutritional status, functional status, and frailty. Notably absent in these studies was any evaluation of age differences in the preoperative symptom experience of these patients. A preoperative evaluation of symptoms is important because previous studies found that higher preoperative symptom burden is associated with poorer postoperative outcomes [1,7,9].

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Only four studies have evaluated symptoms in lung cancer patients prior to surgery [10–13]. In the first study ($n = 110$) [13], the most common symptoms were cough, pain, dyspnea, and insomnia. In the second study of 60 septuagenarians [10], the most frequently reported symptoms were dyspnea, cough, and fatigue. In a third study of 173 patients [12], the most common symptoms were cough, dyspnea, fatigue, and pain. In the final study, that assessed symptom distress in 45 patients prior to lung cancer surgery [11], pain, fatigue, and insomnia were the most distressing symptoms in these patients.

While these four studies provide initial information on the preoperative symptom experience of lung cancer patients, several limitations warrant consideration. First, these studies evaluated 11 [11] to 14 [10,12,13] symptoms. In addition, these evaluations were limited to only ratings of symptom occurrence [10,12,13] or symptom distress [11]. None of these studies reported symptom severity scores or evaluated for differences in multiple dimensions of the symptom experience (i.e., occurrence, severity, distress) between younger and older lung cancer patients prior to surgery.

Given the likelihood that the incidence of lung cancer will increase in the elderly [14], as well as the paucity of research on age differences in the preoperative symptom experience of these patients, the purpose of this study was to evaluate for differences in the symptom experience (i.e., occurrence, severity, distress) between older (≥65 years) and younger (<65 years) patients using a multidimensional symptom assessment scale (i.e., Memorial Symptom Assessment Scale (MSAS)). We hypothesized that older patients would report higher symptom occurrence rates and higher severity and distress scores prior to lung cancer surgery.

2. Methods

2.1. Patients and settings

This study is part of a longitudinal study of symptoms in lung cancer patients who were eligible for surgery. Patients ($n = 270$) were included if they were adults ≥18 years of age; were able to read, write, and understand Norwegian; and were scheduled for surgery for primary lung cancer. Patients were excluded if they were cognitively impaired; their surgery was canceled; or if the histological examination after surgery revealed that they had benign or metastatic disease.

Patients were recruited from three university hospitals in Norway (i.e., Oslo University Hospital in Oslo, St. Olav University Hospital in Trondheim, Haukeland University Hospital in Bergen). The study was approved by the Regional Ethical Review Committee and supported by the Institutional Review Boards (Personvernombudet) at the hospitals involved in the study.

2.2. Study procedures

The majority of the patients (91%) were recruited in the hospital one to three days before surgery. The remaining 9% of the sample was recruited in the outpatient clinic prior to surgery. Research staff approached the patient and explained the purpose of the study. After obtaining written informed consent, patients completed the study questionnaires.

2.3. Instruments

2.3.1. Demographic and clinical characteristics

Patients provided information on gender, marital status, living situation, level of education, and employment status. Research nurses completed information on age, smoking status, lung function, height, weight, and use of preoperative medications. Patients' medical records were reviewed for information on tumor histology, type of surgery, and TNM classification [15]. The TNM classification is a system for cancer staging based on tumor (T), node (N), and metastasis (M).

2.3.2. Self-administered comorbidity questionnaire (SCQ)

The SCQ includes 16 common comorbidities and three optional conditions. Patients indicated whether or not they had the comorbid condition (yes/no); if they had the condition they were asked if they received treatment for it; and finally if it limited their activities. The total SCQ-19 score can range from 0 to 57. A higher total score indicates a more severe comorbidity profile. The SCQ has well established validity and reliability in patients with chronic conditions [16,17] and was used to assess comorbidity in Norwegian oncology patients [18,19].

2.3.3. Memorial Symptom Assessment Scale (MSAS)

The MSAS was developed to evaluate multiple dimensions of the symptom experience in oncology patients [20]. The scale contains a list of 32 physical and psychological symptoms. Patients were asked to indicate whether or not they had the symptom during the past week (i.e., symptoms occurrence). If they experienced the symptom, they were asked to rate its severity and distress. Symptom severity was rated using a four-point Likert scale (1 = slight, 2 = moderate, 3 = severe, 4 = very severe). Symptom distress was rated using a five-point Likert scale (i.e., 0 = not at all, 1 = mild, 2 = moderate, 3 = severe, 4 = very severe). The validity and reliability of the MSAS are well established [20]. The MSAS was used to evaluate symptoms in Norwegian oncology patients [18].

2.4. Statistical analyses

All analyses were done using SPSS version 20 and STATA Version 12.1. Descriptive statistics were used to present demographic and clinical characteristic of the sample. Mean scores for severity and distress ratings were calculated for those patients who reported a symptom. Based on previous studies [4,21,22], patients were dichotomized into older (≥65 years) and younger (<65 years) age groups.

Independent Student's *t*-tests, Mann–Whitney U tests, and Chi Square analyses were used to evaluate for differences in demographic and clinical characteristics between the two age groups. Differences between the two age groups in characteristics with multiple levels (e.g., employment status) were further examined using post hoc contrasts with a Bonferroni correction.

Logistic regression analysis was used to evaluate the effect of increasing age on the occurrence of each symptom. Significant differences, between the older and younger age groups, in the occurrence of each symptom were evaluated using binary logistic regression analyses. To evaluate for differences between the two age groups in the severity and distress ratings for each symptom, ordinal logistic regression was utilized. Because some of the symptoms had a low occurrence rate, regression analyses were performed only when 40 responses were available. In addition, symptom severity and distress ratings were not analyzed if fewer than 10 responses were available in the upper two categories. Deviance tests were used for the binary logistic regression to determine whether the set of covariates improved the fit of the model. Ordinal logistic regression was done with bootstrapping that used at least 1000 repetitions for each analysis. Significance was evaluated with bias-corrected bootstrapped confidence intervals.