Comparison of Chief Complaints and Patient-Reported Symptoms of Treatment-Naive Lung Cancer Patients Before Surgery

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Abstract

Background

Lung cancer patients without chief complaints have been increasingly identified by physical examination. This study aimed to profile and compare chief complaints with patient-reported symptoms of lung cancer patients before surgery.

Methods

Data was extracted from a multicenter, prospective longitudinal study (CN-PRO-Lung 1) in China from November 2017 and January 2020. A comparison between chief complaints and patient-reported symptoms was analyzed using the Chi-squared test.

Results

A total of 201 (50.8%) lung cancer patients without chief complaints were found by physical examination at admission, and 195(49.2%) patients had chief complaints. The top 5 chief complaints were coughing (38.1%), expectoration (25.5%), chest pain (13.6%), hemoptysis (10.6%), and shortness of breath (5.1%). There were significantly more patients with chief complaints of coughing (38.1% vs. 15.0 %, P <0.001) and pain (20.5% vs. 6.9%, P<0.001) than those with the same symptoms rated ≥4 via MDASI-LC. There were less patients with chief complaints of fatigue (1.8% vs. 10.9%, P<0.001), nausea (0.3% vs. 2.5%, P=0.006), and vomiting (0.3% vs. 1.8%, p=0.032) than those with the same symptoms rated ≥4 via MDASI-LC. In patients without chief complaints, the five most common moderate to severe patient-reported symptoms were disturbed sleep (19.5%), distress (13.5%), dry mouth (13%), sadness (12%), and difficulty remembering (11.1%).

Conclusions

Symptoms of lung cancer patients not included in the chief complaint could be identified via a patient-reported outcome instrument, suggesting the necessity of implementing the patient-reported outcome assessment before lung cancer surgery for better patient care.

Introduction

Lung cancer is one of the most common cancers worldwide [1]. Coughing, hemoptysis, and chest pain were initially known as the principal signs of lung cancer. [2]. In recent years, however, with low-dose computerized tomography (CT) being applied in physical examination, more lung cancer patients without chief complaints are being diagnosed by physical examinations rather than by specific symptoms.

Chief complaints may not reflect some potential symptoms that might be identified by patient-reported outcome (PRO) measures [3]. PRO refers to any report that comes directly from the patient about their own health rather than from the clinician or someone else [4]. Research in this area has shown that PRO

can identify symptoms that clinicians may overlook [5]. Most previous articles related to lung cancer focused on postoperative patients or patients undergoing non-surgical treatment [6,7]. Few studies investigated preoperative patients with lung cancer and how preoperative chief complaints might be concordant with PROs is still unknown. Therefore, as lung cancer patients are increasingly identified by physical examination, it is necessary to identify patients' potential symptoms before surgery in order to provide early clinical intervention [8]. The goal of this study was to identify and compare chief complaints and patient-reported symptoms of treatment-naive patients before lung cancer surgery.

Materials And Methods

Patient selection

Data for this cross-sectional design study were extracted from a multicenter, prospective longitudinal study (CN-PRO-Lung 1) in China from November 2017 and January 2020 [9]. The inclusion criteria of patients were: aged ≥18 years, had not received any cancer therapy, did not have other cancer histories, pathologically diagnosed as lung cancer, and received surgical treatment.

Data collection

The electronic medical record system provided demographic, surgical and pathological data. In this analysis, the body mass index (BMI) of Chinese adults was reclassified based on heterogeneity in the Chinese population. Individuals with BMI <18.5 kg/m^2 were classified as low weight, 18.5–23.9 kg/m^2 as average weight, 24.0–27.9 kg/m^2 as overweight, and ≥28.0 kg/m^2 as obese [10].

The symptoms reported by patients were derived from the definition of the MD Anderson Symptom Inventory Lung Cancer Module (MDASI-LC), a validated PRO system designed to assess the severity of multiple symptoms experienced by lung cancer patients [7,11,12,13]. MDASI-LC includes 16 treatment-related core symptoms and 6 daily functional impairment caused by symptoms, with a recall period of 24 hours. The severity score for each symptom ranges from 0 to 10 points with 0 being asymptomatic, 1–3 being mild symptoms, 4–6 being moderate symptoms, 7 or greater being severe symptoms, and 10 being extreme symptoms [14]. MDASI-LC has been recognized an effective and essential tool for quantifying the overall symptom burden for patients with lung cancer [15].

Research Electronic Data Capture (REDCap) is adopted for data management, and all data are finally entered into the project database of this system. The REDCap system was introduced to our hospital by the end of 2017 and hosted at the server of Sichuan Cancer Hospital [16,17].

Statistical analysis

All analyses were performed using SPSS V23.0 software. Symptom items with missing were excluded from the analysis for the corresponding patient. Demographic data, clinical data, and PROs were

presented as numbers and percentages and compared using the Chi-squared test. A two-sided P value less than 0.05 was considered statistically significant.

Results

Basic clinical data

This study involved a total of 396 patients, comprising 209 (52.8%) male and 187 (47.2%) female. Over 60% of the patients were aged ≤60 years (65.2%) and 62.1% had no history of smoking. The majority had adenocarcinoma (82.1%) and early-stage disease (64.6%). The American Society of Anesthesiologists classification of most patients was 0–1 (97.2%). Most patients had a BMI between 18.5 and 24 (60.9%) and 70.5% presented at least 1 combined condition (*Table 1*).

Chief complaints

Out of the 396 patients, 201 patients found by physical examination were without chief complaints at admission, and 195 patients had chief complaints. The top 5 chief complaints were coughing (38.1%), expectoration (25.5%), chest pain (13.6%), hemoptysis (10.6%) and shortness of breath (5.1%) (*Table 2*).

Comparison of same chief complaints and patient-reported symptoms

The chief complaints were compared with the same symptoms assessed by MDASI-LC. There were significantly more patients with chief complaints of coughing (38.1% vs. 15.0 %, P <0.001) and pain (20.5% vs. 6.9%, P <0.001) than those with the same symptoms rated ≥4 via MDASI-LC. There were less patients with chief complaints of fatigue (1.8% vs. 10.9%, P <0.001), nausea (0.3% vs. 2.5%, P=0.006), and vomiting (0.3% vs. 1.8%, P=0.032) than those with same symptoms rated ≥4 via MDASI-LC (*Table 3*).

Patient-reported symptoms in patients without chief complaints

In patients without chief complaints, the most prevalent (MDASI-LC item rated ≥1) patient-reported symptoms were disturbed sleep (49%), dry mouth (49%), difficulty remembering (46.2%), coughing (46%), and fatigue (36%). The most common moderate to severe patient-reported (MDASI-LC item rated ≥4) symptoms were disturbed sleep (19.5%), distress (13.5%), dry mouth (13%), sadness (12%), and difficulty remembering (11.1%) (*Table 4*).

Discussion

In this study, we found that symptom patterns from chief complaints were different from patient-reported symptoms. This study showed that currently the majority of lung cancer patients had no chief complaints before surgery. However, symptoms not included in the chief complaints have been identified via a PRO instrument, suggesting the need to implement the PRO assessment before lung cancer surgery for better patient care.

A study by Birring et al. showed that coughing, hemoptysis, and chest pain were the most common complaints of lung cancer patients [2]. However, the most common complaints of subjects revealed in our study were coughing, expectoration, and chest pain. The likely reason for this inconsistency is that Birring's analysis targeted lung cancer patients with all stages of disease whereas our patients were only in the early lung cancer stages.

Our results, in accordance with other recent studies [8,18], suggested that PRO may be an essential supplement to evaluate symptoms from traditional standard chief complaints. It is generally believed that patients with symptoms reported ≥ 4 is thought to be reflected in the chief complaint, such as fatigue, nausea, and vomiting, but coughing and pain are not. Our research showed there were significantly more patients with chief complaints of coughing and pain than those with the same symptoms rated ≥4 via MDASI-LC. The possible explanation is that the intense discomfort caused by coughing and pain is more likely to affect a patient’s daily life, and thus more easily attract attention. The systemic symptoms of fatigue, nausea, and vomiting attract less attention and so are less likely to be reflected through the chief complaint, indicating that some general symptoms will not be contemplated by the chief complaint but need to be reflected by the PRO. Therefore, future clinical work probably needs to focus more on the patient's psychological state.

Previous studies have proven the importance of identifying initial signs for early diagnosis of lung cancer [19]. Lung cancer patients often have respiratory symptoms at the onset of lung cancer, the most common being coughing, hemoptysis and chest pain. But now more lung cancer patients are found by physical examination. The most common symptoms noticed after physical examinations are disturbed sleep, dry mouth, difficulty remembering, sadness, and fatigue. A study by Mendoza et al revealed that a large proportion of patients with lung cancer are symptomatic. Precise awareness of the primary burden of symptoms is not only useful in evaluating patient-specific therapies but is also crucial in separating disease-related symptoms from potential future treatment-related symptoms [20]. PRO can detect some underlying symptoms. The patient's chief complaint does not include any psychological symptoms, and if the doctor does not ask, the patients will not complain. PRO assessment does not involve a doctor and is more comprehensive than chief complaint assessment [21].

This study has several limitations. Firstly, MDASI-LC is a specific scale for lung cancer, but it was developed and verified in lung cancer patients with chemoradiotherapy, and its symptom items may not completely represent the symptoms of patients undergoing surgery. However, no surgery-specific scale is currently available for lung cancer. Secondly, although the population in this study was large, all patients were from Sichuan Province, thus limiting the ability to generalize findings to all of China. However, our lung cancer data were basically consistent with the global data [22], so our study findings may also apply at the national level.

Conclusions

Our study highlights the importance of PRO for the management of lung cancer. Currently, the chief complaints of lung cancer patients have gradually changed. Potential symptoms, mostly non-specific or psychological symptoms, can be easier identified by PRO assessment. These findings suggest that implementing the PRO assessment before lung cancer surgery is necessary for better patient care.

Abbreviations

CT: computerized tomography; BMI: Body mass index; PRO: patient-reported outcome; MDASI-LC: MD Anderson Symptom Inventory Lung Cancer Module; RED Cap: Research Electronic Data Capture.

Declarations

Ethics approval and consent to participate

The study protocol was approved by the Ethics Committee of Sichuan Cancer Hospital (approved number: SCCHEC-02-2017-042), and the ClinicalTrials.gov registration number is NCT03341377.

I confirm that all experiments were performed in accordance with relevant guidelines and regulations, and confirm that informed consent was obtained from all subjects.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors have no conflicts of interest to declare.

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Authors’ contributions

F Liu and Q Shi designed the study. W Dai, X Wei, S Xie, W Xu provided and analysed the data. Y Feng, Y Wang, J Liao collect and assumed data; Y Feng wrote and edited the manuscript, all authors have read and approved the manuscript.

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Tables

Table 1. Demographic and basic clinical characteristics of the 396 patients

Variables	Number (%)
Age (years)	
≤60	258 (65.2)
>60	138 (34.8)
Gender	
Male	209 (52.8)
Female	187 (47.2)
Chief complaint	
No	201 (50.8)
Yes	195 (49.2)
Smoking history	
No	246 (62.1)
Yes	150 (37.9)
Pathological type	
Adenocarcinoma	325 (82.1)
Non-adenocarcinoma	71 (17.9)
Pathological tumor stage	
0–Ⅱ	256 (64.6)
Ⅲ–IV	140 (35.4)
ASA classification	
0–Ⅱ	385 (97.2)
Ⅲ–IV	11 (2.8)
Body Mass Index (kg/m^2)	
<18.5	18 (4.5)
18.5–23.9	241 (60.9)
≥24.0	137 (34.6)
Charlson Comorbidity Index	
0	117 (29.5)
1–5	279 (70.5)

ASA: American Society of Anesthesiologists

Table 2. The chief complaints of the 396 patients	
Symptoms	**Number (%)**
Incidental finding and asymptomatic	201 (50.8)
Coughing	151 (38.1)
Expectoration	101 (25.5)
Chest pain	54 (13.6)
Hemoptysis	42 (10.6)
Shortness of breath	21 (5.3)
Chest distress	15 (3.8)
Back pain	14 (3.5)
Other symptoms	13 (3.3)
Fever	8 (2.0)
Fatigue	7 (1.8)
Headache	6 (1.5)
Weight loss	5 (1.3)
Shoulder pain	4 (1.0)
Hoarseness	3 (0.8)
Other signs	3 (0.8)
Abdominal pain	2 (0.5)
Nausea	1 (0.3)
Vomiting	1 (0.3)
Palpitation	1 (0.3)

Table 3. Comparison of same chief complaints and patient-reported symptoms

Symptom	Chief complaint, n (%)	MDASI-LC item rated ≥4, n (%)	P value
Coughing	151 (38.1)	59 (15.0)	<0.001
Pain	81 (20.5)	27 (6.9)	<0.001
Shortness of breath	21 (5.3)	31 (7.9)	0.146
Fatigue	7 (1.8)	43 (10.9)	<0.001
Nausea	1 (0.3)	10 (2.5)	0.006
Vomiting	1 (0.3)	7 (1.8)	0.032

Table 4. Patient-reported symptoms in patients without chief complaints

Symptoms	Available cases (N)	MDASI-LC item rated ≥1, n (%)	MDASI-LC item rated ≥4, n (%)
Disturbed sleep	200	98 (49)	39 (19.5)
Dry mouth	200	98 (49)	26 (13)
Difficulty remembering	199	92 (46.2)	22 (11.1)
Coughing	200	92 (46)	13 (6.5)
Fatigue	200	72 (36)	17 (8.5)
Drowsiness	201	72 (35.8)	11 (5.5)
Distress	200	66 (33)	27 (13.5)
Sadness	200	60 (30)	24 (12)
Constipation	200	59 (29.5)	19 (9.5)
Lack of appetite	201	59 (29.4)	8 (4.0)
Shortness of breath	201	58 (28.9)	9 (4.5)
Sore throat	200	57 (28.5)	7 (3.5)
Numbness or tingling	201	37 (18.4)	4 (2.0)
Pain	200	34 (17)	8 (4)
Nausea	199	23 (11.6)	5 (2.5)
Vomiting	201	19 (9.5)	6 (3.0)