

Health-related quality of life in patients with lung cancer

Libo Han¹, Ri Li, Xia Wang^{*}



Abstract

Lung cancer has been the most common type of cancer worldwide for several decades. 55 patients treated for lung cancer with a mean age of 60.9 ± 4.2 evaluated through Health-related QoL (HRQoL) were assessed individually using the valid and reliable questionnaires Cancer Quality of Life EORTC (QLQ) - C30 and QLQ - H&N35. The functioning scale in the QLQ-C30 questionnaire with the lowest average score was global health status. The mean QLQ-C30 summary score (77.17 ± 11.4). The symptoms with the highest scores were dyspnea, weight loss, and muscle atrophy. Linear regression analysis demonstrated that Global health status score was associated with education level [β -coefficient = 15.21 (95% CI: 10.2-21.9, $P=0.01$), alcohol consumption [β -coefficient=11.02 (95% CI: 5.3-16.3), $P=0.01$]. In conclusion. This study demonstrated several predictors of worse perception of HRQoL through study. Moreover, these predictors should be the focus of preventive measurements, early detection of lung cancer, and target therapy.

Keywords: Lung cancer; QLQ-C30; QLQ - H&N35

^{*}Corresponding author email: Obukhova_np23@yahoo.com

¹ Department of Psychiatry, Wuhan Mental Health Center, Wuhan, China

Received 23 May 2023; revised 04 August 2023; accepted 06 September 2023; published 21 October 2023

Copyright © 2023 Obukhova NP, et al. This is article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0) (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Introduction

For several decades lung cancer has been the most common cancer in the world [1]. In 2014 there were 46,403 new cases of lung cancer diagnosed in the UK.2 It is the third most common cancer after breast and prostate but has the largest proportion of all cancer-related deaths (22%) [2].

The overall age-standardized incidence has declined slightly over the past 40 years, which is a combination of a marked decline among men and an increase for women. Approximately 62% of people have advanced-stage disease at diagnosis [3]. When combining all stages of lung cancer in England, 1-year survival has improved from 24.5% in 1995–9 to 36.7% currently [4]. Much of this improvement has occurred since 2010 and is attributed to developments in lung cancer care.



The most commonly used instruments to assess the Health-Related Quality of Life (HRQoL) of patients with head and neck cancer are the 30-item Cancer-Quality of Life Questionnaire (QLQ-C30) and lung Cancer-Quality of Life Questionnaire module (QLQ-H&N35), developed by the European Organization for Research and Treatment of Cancer (EORTC) [5].

The EORTC QLQ-C30 and the module QLQ-H&N35 instruments have been translated into many languages, recently, EORTC Quality of Life Group has developed and recommended the QLQ-C30 summary score as the superior instrument of assessment for overall HRQoL [6-11]. We aimed to determine the HRQoL of patients with lung cancer and to identify important QoL predictors by analyzing many demographic and clinical factors [12-15].

Patients and Methods

This descriptive cross-sectional study included 55 consecutive patients (mean age 60.9 ± 4.2) years old, diagnosed with and treated for lung cancer. The study was assessed during the period from February 2022 to January 2023. Eligibility criteria of patients comprised: surgically treated and pathologically proven lung cancer, treatment completed 8 months before being included in the present study, and completion of the self-reported questionnaire. Patients with recurrent disease, mental and behavioral disorders, and uncooperative patients were excluded from the study. Twelve participants were removed from the initial sample ($n=55$), 4(7.4%) refused to participate and 3(4.3%) because of the uncompleted questionnaire. The study was conducted under the Declaration of Helsinki. All patients provided written information consent to participate in this study.

Statistical analysis

All data were analyzed using SPSS 20.0 software (IBM Corp., Armonk, NY). Continuous variables are expressed as mean \pm standard deviation or median (interquartile range), and categorical variables are expressed as numbers and percentages. Differences in baseline characteristics among the three groups were analyzed by one-way ANOVA. Differences in relevant indicators between two groups were compared using Tukey's test. Correlations between RDW and PDW and cancer stage in patients with ovarian cancer were analyzed by Spearman's correlation. Sensitivity and specificity were defined by receiver-operating characteristic curves, and differences in the area under the curve (AUC) were detected using MedCalc version 15.0. A *P* value of < 0.05 was considered statistically significant.

Results

Demographic and clinical parameters for the 55 patients with lung cancer. The average score values of different scales for EORTC QLQ-C30 and QLQ-H&N35. The functioning scale with the lowest average score was Global health status, whereas the functioning scales with the highest scores were observed in the physical, social, and cognitive domains. The symptom



with the highest average score in the QLQ-C30 questionnaire was dyspnea. The mean QLQ-C30 summary score was 80.92 ± 10.4 . In the QLQ-H&N35 questionnaire, the symptoms with the highest scores were weight loss, weight loss, and muscle atrophy. The impact of demographic and clinical characteristics of the Global health status score and EORTC QLQ-C30. The Global health status score was lowest in unemployed, patients from rural areas, after lobectomy ($P=0.046$, $P=0.036$ respectively).

Discussion

In our study, the Global health status had a lower score compared to other functioning scales which is similar to previous research in lung cancer [16-21]. Healthy levels of functioning in this study were observed in the physical, social, and cognitive domains, which are in line with previous oral cancer studies [22]. Among the presented patients in our study, general symptoms with the highest mean score were financial difficulties, appetite loss, and fatigue. Previous research has already reported similar results in patients with lung cancer [23].

QLQ-C30 summary score exhibits equator better validity compared to the Global health status and other individual QLQ-C30 scales, which is in agreement with our results [24]. Analyzing the severity of symptoms by QLQ-H&N35 questionnaires, the most common specific symptoms were weight loss and dyspnea, also reported in the study with lung cancer [25]. Unlike others, we found that social eating was a pronounced problem in our respondents, especially in female, explained by the higher representation of life with family and lack of privacy [26].

This study found several demographic and clinical correlates of QOL in patients with lung cancer. Female patients with lung cancer had worse psychological QOL which may be related to gender differences in the prevalence of risk factors associated with poor QOL [27], for example, female patients with cancer may have more psychological and social issues than male patients. The study by other researchers reported a significant association between a low socioeconomic status and poor QOL in patients with lung cancer in Iran [28]. Similarly, we found a significant association between poor QOL with fewer education years and poor economic status in Chinese patients with lung cancer. Consistent with previous findings, we found that unmarried patients had poorer physical QOL than married patients.

As expected, metastasis was negatively associated with physical QOL. Due to worse global health status, impaired physical functioning, and more physical symptoms associated with metastatic cancer, patients with metastatic lung cancer reported poorer QOL [29]. Because of the rapid progression of small-cell cancer, most patients with small-cell lung cancer have been at a terminal stage when their cancer is diagnosed which could explain the significant relationship between small-cell type and poor psychological QOL in our study [30]. Cheng and colleagues found that QOL of patients with lung cancer varied across different treatment regimens, with chemotherapy having the worst QOL and surgery having the best QOL [31]. Our finding on the poor psychological QOL among patients receiving chemotherapy relative to other treatments is by it which may be explained by the many unbearable side effects of



chemotherapy and the deteriorating physical health of patients receiving chemotherapy. In this study, patients who experienced more intense pain had poorer psychological QOL [32]; this might be due to the deleterious effects of pain on patients' mental health, employment status, sleep, and personal relationships [33]. Studies have shown that the ability to perform daily activities and self-care are two important determinants of QOL in patients with cancer. Owing to functional limitations in hospitalized patients with lung cancer, a significant association between poor performance status and low physical and psychological QOL is expected [34].

Conclusions

This study demonstrated that several predictors of worse perception of HRQoL through study. Moreover, these predictors should be the focus of preventive measurements, early detection of lung cancer, and target therapy.

Conflict of Interest

No conflicts of interest were declared by the authors.

Financial Disclosure

The authors declared that this study has received no financial support.

Ethics Statement

Not applicable.

Authors' contributions

All authors shared in the conception and design and interpretation of data, drafting of the manuscript and critical revision of the case study for intellectual content and final approval of the version to be published. All authors read and approved the final manuscript.

Open access

This is an open-access article distributed by the Creative Commons Attribution Non-Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial.

<http://creativecommons.org/licenses/by-nc/4.0/>.



References

1. Walters S, Benitez-Majano S, Muller P, et al. Is England closing the international gap in cancer survival? *Br J Cancer*. 2015; 113:848–60.
2. Tanvetyanon T, Robinson LA, Schell MJ, et al. Outcomes of adrenalectomy for isolated synchronous versus metachronous adrenal metastases in non-small-cell lung cancer: a systematic review and pooled analysis. *J Clin Oncol*. 2008; 26:1142–7.
3. Office for National Statistics Cancer survival by stage at diagnosis for England (experimental statistics): Adults diagnosed 2012, 2013 and 2014 and followed up to 2015. 2016. ONS.
4. Falcoz PE, Puyraveau M, Thomas PA, et al. Video-assisted thoracoscopic surgery versus open lobectomy for primary non-small-cell lung cancer: a propensity-matched analysis of outcome from the European Society of Thoracic Surgeon database. *Eur J Cardiothorac Surg*. 2016; 49:602–9.
5. Riaz SP, Linklater KM, Page R, et al. Recent trends in resection rates among non-small cell lung cancer patients in England. *Thorax*. 2012; 67:811–14.
6. Ferrell BR, Temel JS, Temin S, et al. Integration of Palliative Care Into Standard Oncology Care: American Society of Clinical Oncology Clinical Practice Guideline Update. *J Clin Oncol*. 2017; 35:96–112.
7. Cancer Research UK. Lung cancer diagnosis and treatment statistics. Cancer Research UK, 2016.
8. O'Dowd EL, McKeever TM, Baldwin DR, et al. What characteristics of primary care and patients are associated with early death in patients with lung cancer in the UK? *Thorax*. 2015; 70:161–8.
9. Goldstraw P, Chansky K, Crowley J, et al. The IASLC Lung Cancer Staging Project: Proposals for revision of the TNM stage groupings in the forthcoming (eighth) edition of the TNM classification for lung cancer. *J Thorac Oncol*. 2016; 11:39–51.
10. Fayers PM, Aaronson NK, Bjordal K, et al. The EORTC QLQ-C30 Scoring Manual (3rd Edition). European Organisation for Research and Treatment of Cancer, Brussels 2001.
11. Husson O, de Rooij BH, Kieffer J, et al. The EORTC QLQ-C30 Summary Score as Prognostic Factor for Survival of Patients with Cancer in the "Real-World": Results from the Population-Based PROFILES Registry. *Oncologist*. 2020; 25(4):e722-e732.



12. Aaronson NK, Ahmedzai S, Bergman B, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst.* 1998; 85(5): 365-76.
13. Chua IS, Zachariah F, Dale W, et al. Early integrated telehealth versus in-person palliative care for patients with advanced lung cancer: A study protocol. *J Palliat Med.* 2019; 22:S-7.
14. Cella DF, Bonomi AE, Lloyd SR, et al. Reliability and validity of the functional assessment of cancer therapy—lung (FACT-L) quality of life instrument. *Lung Cancer.* 1995; 12:199–220.
15. Dharma-Wardene M, Au H-J, Hanson J, et al. Baseline FACT-G score is a predictor of survival for advanced lung cancer. *Qual Life Res.* 2004; 13:1209–1216.
16. Eton DT, Cella D, Yost KJ, et al. A combination of distribution- and anchor-based approaches determined minimally important differences (MIDs) for four endpoints in a breast cancer scale. *J Clin Epidemiol.* 2004; 57:898–910.
17. Kroenke K, Spitzer RL, and Williams JBW: The PHQ-9. *J Gen Intern Med.* 2001; 16:606–613.
18. Dionne-Odom JN, Hull JG, Martin MY, et al. Associations between advanced cancer patients' survival and family caregiver presence and burden. *Cancer Med.* 2016; 5:853–862.
19. Courtin E and Knapp M. Social isolation, loneliness and health in old age: A scoping review. *Health Soc Care Commun.* 2017; 25:799–812.
20. Holt-Lunstad J, Smith TB, Baker M, et al. Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspect Psychol Sci.* 2015; 10:227–237.
21. Helgeson VS. Social support and quality of life. *Qual Life Res.* 2003; 12(Suppl 1):25–31.
22. Katschnig H, Freeman H, Sartorius N. *Quality of Life in Mental Disorders.* 2nd edn New York: Wiley, 2005.
23. Mohammed GK, Mohammed SM, Hadi NR, et al. Association between Natural Killer Cell Cytotoxicity and the Progression of Non-Small Cell Lung Cancer. *Sys Rev Pharm.* 2020; 11(4): 543-551.
24. Hsu YH, Chai HY, Lin YF, et al. Health-related quality of life and satisfaction with case management in cancer survivors. *J Clin Nurs.* 2017; 26:4597–604.
25. Pergolotti M, Deal AM, Williams GR, et al. Activities, function, and health-related quality of life (HRQOL) of older adults with cancer. *J Geriatr Oncol.* 2017; 8:249–54.
26. McCarberg BH, Nicholson BD, Todd KH, et al. The impact of pain on quality of life and the unmet needs of pain management: results from pain sufferers and physicians participating in an Internet survey. *Am J Ther.* 2008; 15:312–20.



27. Salomaa ER, Sällinen S, Hiekkänen H, et al. Delays in the diagnosis and treatment of lung cancer. *Chest*. 2005; 128:2282–8.
28. Montazeri A, Hole DJ, Milroy R, et al. Quality of life in lung cancer patients: does socioeconomic status matter? *Health Qual Life Outcomes*. 2003; 1:19.
29. Myrdal G, Valtysdottir S, Lambe M, et al. Quality of life following lung cancer surgery. *Thorax*. 2003; 58:194–7.
30. Lee LJ, Chung CW, Chang YY, et al. Comparison of the quality of life between patients with non-small-cell lung cancer and healthy controls. *Qual Life Res*. 2011; 20:415–23.
31. Xia P, Li N, Hau KT, et al. Quality of life of Chinese urban community residents: a psychometric study of the mainland Chinese version of the WHOQOL-BREF. *BMC Med Res Methodol*. 2012; 12:37.
32. Lencioni R, Crocetti L, Cioni R, et al. Response to radiofrequency ablation of pulmonary tumours: a prospective, intention-to-treat, multicentre clinical trial (the RAPTURE study) *Lancet Oncol*. 2008; 9:621–8.
33. Felip E, Sakai H, Patel J, et al. OA12.01 Phase II data for the MET inhibitor tepotinib in patients with advanced NSCLC and MET exon 14-skipping mutations. *J Thorac Oncol*. 2018; 13(10):S347.
34. Hadi N, Lee J, Adrienne J, et al. Expression of IL-32 modulates NF-κB and p38 MAP kinase pathways in human esophageal cancer. *Cytokine*. 2014; 61(1):223-227.



American Journal of BioMedicine

Journal Abbreviation: AJBM
ISSN: 2333-5106 (Online)
DOI: 10.18081/issn.2333-5106
Publisher: BM-Publisher
Email: editor@ajbm.net

