

[ORIGINAL ARTICLE]

Homeless Patients with Lung Cancer in Metropolitan Tokyo

Tomoyo Oguri^{1,2}, Shinji Sasada¹, Takashi Shimada^{1,3}, Kota Ishioka¹, Saeko Takahashi¹,
Tomohide Adachi⁴ and Morio Nakamura¹

Abstract:

Background Homeless persons are those who carry out their activities of daily living in city parks and other facilities. Little is known about homeless patients with lung cancer in Japan. Therefore, we characterized the clinical features and outcomes of homeless people in metropolitan Tokyo.

Methods Between January 2014 and August 2018, 2,068 homeless patients were admitted to the homeless patient care unit at Tokyo Saiseikai Central Hospital. Of these, 13 patients were treated for primary lung cancer. We retrospectively analyzed the patients' clinical characteristics, including their age, gender, treatment, and outcome, obtained from the hospital's electronic medical records.

Results A total of 13 patients were treated for lung cancer. The median age was 66.2 (range, 51-77) years old. Twelve patients (92.3%) were smokers. All of the patients were men and had advanced lung cancer. Of these, four patients had adenocarcinoma, four had squamous carcinoma, and four had other histologies. Ten patients received chemotherapy, and 3 received chemoradiotherapy (carboplatin, n=8; cisplatin, n=2, immune check point inhibitor, n=2; other, n=1). Of the patients on first-line treatment, 58% discontinued treatment, with 71% doing so willfully. The median overall survival was 7.5 (1-44) months. During the study, nine patients died in the hospital, and four were lost to follow up.

Conclusion It is difficult for homeless patients to continue chemotherapy, and they often quit therapy willfully. Therefore, it is necessary to develop an education and health insurance support system to ensure treatment continuity in a good social environment.

Key words: homeless, lung cancer, homeless patient care unit, health insurance support system

(Intern Med 60: 3221-3224, 2021)

(DOI: 10.2169/internalmedicine.6833-20)

Introduction

Homeless persons are those who carry out their activities of daily living in city parks, rivers, roads, and other facilities. According to a report by the Ministry of Health, Labor, and Welfare, the number of confirmed homeless persons in 2019 was 4,555, reflecting a decrease of 422 (-8.5%) from the previous year. Since 2002, the Saiseikai Central Hospital has had 43 beds dedicated to the needy. We aim to treat sick homeless patients in our facility and restore their health. We provide medical support to them despite their difficult financial and social circumstances.

Lung cancer remains the leading cause of cancer-related

death in Japan and around the world. Cigarette smoking is known to be a risk factor for lung cancer, and a high prevalence of smoking has been observed in homeless people (1, 2). Despite the high cancer burden, homeless people have limited access to medical care, and cancer screening rates are lower than in the general population (3, 4). Therefore, their mortality is also higher than in the general population. However, little is known about homeless patients with lung cancer in Japan.

Given the above, we characterized the clinical features and outcomes of homeless people in Japan.

¹Department of Respiratory Medicine, Tokyo Saiseikai Central Hospital, Japan, ²Department of Clinical Oncology, St. Marianna University School of Medicine, Japan, ³Department of Internal Medicine, Hino Municipal Hospital, Japan and ⁴Department of General Internal Medicine, Tokyo Saiseikai Central Hospital, Japan

Received: December 1, 2020; Accepted: March 15, 2021; Advance Publication by J-STAGE: April 26, 2021

Correspondence to Dr. Tomoyo Oguri, tomonet1206@gmail.com

Table 1. Patient characteristics.

Characteristics	n=13
Age at the diagnosis, years; median (range)	66.2 (51-77)
Gender, male/female	13 (100.0%)/0 (0%)
Stage, III/IV	5 (38%)/8 (62%)
Performance status, 0-1/≥2	10 (77%)/3 (23%)
Smoking status, never/former/current	1 (8%)/2 (15%)/10 (77%)
Brinkman Index, median (range)	590 (250-2, 000)
BMI (kg/m ²), median (range)	19.6 (14.5-24.6)
Pathology	
NSCLC	12 (93%)
AD/SQ/NOS/LC	4 (31%)/4 (31%)/2 (14%)/2 (14%)
Small cell carcinoma	1 (7%)

NSCLC: non-small-cell carcinoma, AD: adenocarcinoma, SQ: squamous cell carcinoma, NOS; not otherwise specified, LC: large cell carcinoma

Table 2. Contents of Treatment.

	n=13
Therapy, chemotherapy/chemoradiotherapy	10 (77%)/3 (23%)
Regimen, carboplatin/cisplatin/ICI/EGFR-TKI	8 (62%)/2 (15%)/2 (15%)/1 (7%)
Number of regimens, 1/2/≥3	7 (58%)/3 (25%)/2 (17%)

ICI: immune check point inhibitor, EGFR-TKI: epidermal growth factor tyrosine kinase inhibitor

Genetic testing was performed on eight of the NSCLC patients; one was positive for an EGFR mutation, and a high PD-L1 expression was noted in three patients.

Table 3. Reasons for Discontinuing Chemotherapy after First-line Treatment.

	n=7
Willful suspension by the patient	5 (71%)
General condition worsened	1 (14%)
Adverse events	1 (14%)

Of these patients, 92.3% were smokers (current or former), and the mean Brinkman index was 590. The mean body mass index (BMI) was 19.6 (14.5-24.6) kg/m². All patients had advanced lung cancer (stage III or IV). The performance status was 0-1 in 77% of the patients. Twelve patients had non-small-cell lung carcinoma [NSCLC; four with adenocarcinoma, four with squamous carcinoma, two with not otherwise specified (NOS), and two with large cell carcinoma], and one patient had small cell lung cancer (SCLC). Genetic testing was performed on eight of the NSCLC patients: one was positive for an epidermal growth factor receptor (EGFR) mutation and high programmed death-ligand 1 (PD-L1) expression was noted in three patients.

Ten patients received chemotherapy, and three received chemoradiotherapy. The chemotherapy regimens included carboplatin, cisplatin, immune checkpoint inhibitors (ICIs), and EGFR-tyrosine kinase inhibitors (TKIs) in eight, two, two, and one patient, respectively (Table 2). Of the patients on first-line treatment, 58% discontinued treatment, with 71% doing so willfully (Table 3). They gave reasons such as, “I thought I didn’t need any more treatment because I had recovered,” “I was disgusted by the stress of hospitalization itself,” and “I didn’t like it because I had a chemotherapy-related fever and pneumonia.”

The median overall survival in the homeless patients with NSCLC was 7.5 (1-44) months (Figure). During the study, nine patients died in the hospital, and four were lost to follow up.

Materials and Methods

From January 2014 to August 2018, of 2,068 homeless patients admitted to the homeless patient care unit at Tokyo Saiseikai Central Hospital in Tokyo, 221 had respiratory diseases. Of these, 13 patients were treated for primary lung cancer. We retrospectively analyzed the patients’ demographic and clinical characteristics, including their age, gender, chief complaint, treatment, and outcome, obtained from the hospital’s electronic medical records.

The overall survival was calculated using the Kaplan-Meier method.

Results

The characteristics of the 13 patients treated for lung cancer are summarized in Table 1. The median age was 66.2 (range, 51-77) years old. All the patients (n=13) were men.

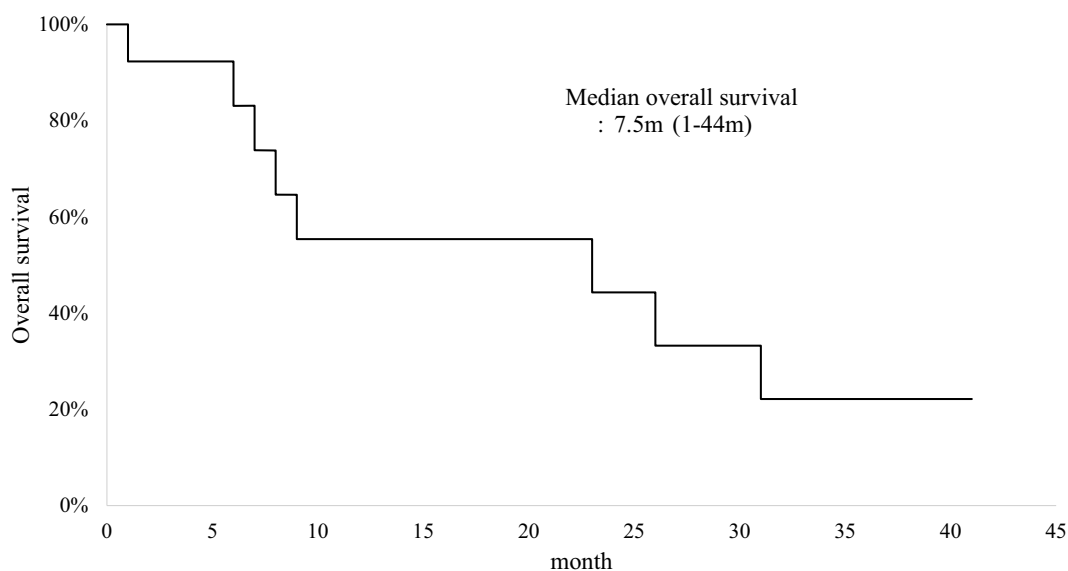


Figure. The median overall survival in homeless patients with non-small-cell lung cancer.

Discussion

To our knowledge, this is the first survey involving homeless patients with lung cancer in Japan. The mortality rate of homeless patients with advanced-stage NSCLC is reportedly higher than that of the general population (5). According to a Korean report, most homeless lung cancer patients have advanced cancer with distant metastases, and the median overall survival time is as short as 2.4 months with a poor prognosis (6). Cancer is known to be the leading cause of death among homeless people (7). In this study, the median overall survival in patients with NSCLC was 7.5 months (Figure), which was shorter than that in previous clinical trials (12.3-13.9 months) (8) and in clinical practice (17.9 months) (9).

Although only 15% of the patients received ICIs in this study, ICI use in homeless patient may be increased in the future, according to the NSCLC treatment guidelines (10). Therefore, the prognosis for homeless lung cancer patients is likely to have improved after our study period had concluded.

About 68-81% of homeless people are smokers, and the incidence of lung cancer is more than double (4) in this population compared with non-smokers. Indeed, 92% of the patients in our study had a smoking history.

The cancer screening rate in homeless individuals is significantly lower than that in the general population (3). In this study, 46.2% of the patients were hospitalized at the emergency department due to various symptoms unrelated to lung cancer. Two cases were referred to our hospital because an abnormality was found on chest radiographs obtained through tuberculosis screening in health centers.

In this study, 58% of lung cancer patients discontinued the first-line treatment, 71% doing so willfully, as some of the patients did not understand the need to continue their

treatment. Medication adherence is an important determinant of successful medical treatment.

The prevalence of mental illness among homeless persons is reported to be up to 42% in the United Kingdom. Homeless people often have borderline mental retardation diagnosed during a psychological examination, resulting in a poor conversation ability, low stress tolerance and depression, somatization, and low interest in preventive medicine (11). Although we did not investigate the morbidity of psychiatric disorders among homeless individuals, a potential underlying mental illness might lead to higher ambulance transport rates and self-interruption of lung cancer treatment.

Unlike other countries, including the United States (12), all residents of Japan are required by the law to have health insurance coverage. However, homeless people who are vulnerable to socioeconomic factors do not have health insurance certificates, have few opportunities to undergo medical examinations, and thus give up on their cancer therapy. Therefore, there is a possibility of achieving a long-term survival by improving the support environment to encourage continuing treatment and educating these patients.

Saiseikai, the organization that runs Tokyo Saiseikai Central Hospital, was established in 1911 as the Imperial Gift Foundation based on the Imperial Rescript by Emperor Meiji to provide medical care to the needy. After World War II, the number of homeless people increased rapidly, and illness among this population became a social issue. Therefore, the Tokyo Metropolitan Minsei Hospital was established in 1853, although it was closed in 2002. Tokyo Saiseikai Central Hospital then took over its functions to provide medical support for homeless people.

The problems faced by homeless people are becoming increasingly complex, covering not only medical care and welfare but also employment, housing, education, and other aspects. Therefore, we will further promote effective, wide-

ranging support for homeless people in cooperation with the government. While homeless patients are being treated in the hospital, our Medical Social Workers intervene to help them receive welfare, find housing, and continue to be ambulatory after discharge. These efforts at Tokyo Saiseikai Central Hospital may be the reason for the longer overall survival in Japanese homeless patients compared to homeless patients in other countries (5, 6).

However, the high cost of cancer treatment has been greatly debated in recent years and is a complex issue (13).

Conclusion

Most of the homeless lung cancer patients in the homeless patient care unit are at an advanced cancer stage. In many cases, the prognosis is very poor because it is impossible for some patients to understand the reason treatment continuation is needed, and they drop out. Therefore, an education and health insurance support system needs to be established to help these patients continue treatment in a good social environment.

The study protocol was approved by the Saiseikai Central Hospital review board (approval no.30-65) and conducted in accordance with the principles of the Declaration of Helsinki and local regulations. A patient consent statement was not necessary.

The authors state that they have no Conflict of Interest (COI).

References

1. Pratt R, Pernat C, Kerandi L, et al. "It's a hard thing to manage when you're homeless": the impact of the social environment on smoking cessation for smokers experiencing homelessness. *BMC Public Health* **19**: 635, 2019.
2. Baggett TP, Lebrun-Harris LA, Rigotti NA. Homelessness, cigarette smoking and desire to quit: results from a US national study: homelessness and smoking. *Addiction* **108**: 2009-2018, 2013.
3. Chau S, Chin M, Chang J, et al. Cancer risk behaviors and screening rates among homeless adults in Los Angeles county. *Cancer Epidemiol Biomarkers Prev* **8**: 431-438, 2002.
4. Baggett TP, Chang Y, Porneala BC, Bharel M, Singer DE, Rigotti NA. Disparities in cancer incidence, stage, and mortality at Boston health care for the homeless program. *Am J Prev Med* **49**: 694-702, 2015.
5. Concannon KF, Thayer JH, Wu QV, Jenkins IC, Baik CS, Linden HM. Outcomes among homeless patients with non-small-cell lung cancer: a county hospital experience. *JCO Oncol Pract* **16**: e1004-e1014, 2020.
6. Suh KJ, Kim KH, Lim J, Park JH, Kim J-S, Choi IS. Lung cancer in homeless people: clinical outcomes and cost analysis in a single institute. *Can Respir J* **2016**: 1-6, 2016.
7. Hwang SW. Causes of death in homeless adults in Boston. *Ann Intern Med* **126**: 625, 1997.
8. Ohe Y, Ohashi Y, Kubota K, et al. Randomized phase III study of cisplatin plus irinotecan versus carboplatin plus paclitaxel, cisplatin plus gemcitabine, and cisplatin plus vinorelbine for advanced non-small-cell lung cancer: Four-Arm Cooperative Study in Japan. *Annals of Oncology* **18**: 317-323, 2007.
9. Takano N, Ariyasu R, Koyama J, et al. Improvement in the survival of patients with stage IV non-small-cell lung cancer: experience in a single institutional 1995-2017. *Lung Cancer* **131**: 69-77, 2019.
10. Ettinger DS, Wood DE, Aggarwal C, et al. NCCN guidelines insights: non-small cell lung cancer, version 1. 2020: featured updates to the NCCN guidelines. *J Natl Compr Canc Netw* **17**: 1464-1472, 2019.
11. Fazel S, Khosla V, Doll H, Geddes J. The prevalence of mental disorders among the homeless in western countries: systematic review and meta-regression analysis. *PLoS Med* **5**: e225, 2008.
12. Bielenberg JE, Futrell M, Stover B, Hagopian A. Presence of any medical debt associated with two additional years of homelessness in a Seattle sample. *INQUIRY* **57**: 004695802092353, 2020.
13. Gyawali B, Sullivan R. Economics of cancer medicines: for whose benefit? *New Bioeth* **23**: 95-104, 2017.

The Internal Medicine is an Open Access journal distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view the details of this license, please visit (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).