Epidemiological and Therapeutic Analyses in Lung Cancer Patients Over 80 Years Old in the Hokushin Region: A Retrospective Hospital Administrative Database Study

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Abstract

Little is known about annual clinical practice in patients with lung cancer over 80 years old. In this analysis, we found several differences in treatment pattern between patients < 80 and ≥ 80 years old. Propensity score matching analysis including sex, stage, and comorbidities indicated that age over 80 years itself is significantly related to the choice of no treatment.

Objective: This study was performed to validate the epidemiology, initial treatment, and clinical practice in lung cancer patients < 80 and ≥ 80 years in Hokushin region, Japan. **Methods:** We retrospectively surveyed data of 5481 newly diagnosed and registered lung cancer patients (4311 [78.7%] < 80 years; 1170 [21.3%] ≥ 80 years) in 22 principal hospitals in Hokushin region linked with health insurance claims data between 2016 and 2017. Stage, initial treatment, and clinical practice were compared between the 2 groups. **Results:** The distributions of clinical stage I/II/III/IV/unknown were 2535/387/654/1371/111 in non-small cell lung cancer (NSCLC) and 37/32/114/237/3 in SCLC. Initial surgery for stage I NSCLC was performed in 90.0% and 60.2% of cases in the < 80 and ≥ 80 years groups, respectively. Rates of treatment with best supportive care (BSC) for stage IV disease were significantly higher in the ≥ 80 than the < 80 years group (NSCLC:58.9% vs. 18.7%; SCLC: 42.3% vs. 6.8%, respectively), regardless of the presence/absence of comorbidities. Propensity score matching showed that age ≥ 80 years itself was significantly related to choice of BSC in patients with lung cancer. The ratio of initial cytotoxic chemotherapy for NSCLC was low (49.9%) but that of biomarker-based therapy including tyrosine kinase inhibitors and immune checkpoint inhibitors (50.0%) was significantly higher in the ≥ 80 than < 80 years group (70.2% vs. 29.8%, respectively). **Conclusion:** There are several differences in treatment pattern between patients < 80 and ≥ 80 years. Age ≥ 80 years may be related to BSC choice in patients with lung cancer.

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Keywords: Comorbidity, Best supportive care, Elderly, Hospital-based cancer registry, Therapy

Abbreviations: NSCLC, (non-small cell lung cancer); SCLC, (small cell lung cancer); DPC, (diagnosis procedure combination); HBOR, (hospital-based cancer registry); EGFR, (epidermal growth factor receptor); ALK, (anaplastic lymphoma kinase).

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Introduction

Lung cancer is the leading cause of death from cancer worldwide, including Japan, with about 85% to 90% of cases presenting as non-small cell lung cancer (NSCLC) and the rest as small cell lung cancer (SCLC).[1-3] The incidence of newly diagnosed lung cancer is increasing, mainly in the elderly population.[3-5] Based on a recent hospital-based cancer registry in Japan, the population of patients with lung cancer ≥ 75 years old (yo) accounts for 45.7% of all cases.[2] Several societies, including the Japanese Lung Cancer Society, release updated guidelines for management of lung cancer according to the results of clinical trials.[6,7] However, the therapeutic evidence for elderly patients is sparse because many clinical trials have been performed in population of mainly younger patients.[5,8] In addition, the results of clinical trials in elderly patients with lung cancer, conducted in populations with excellent performance status and fewer comorbidities, may not be applicable to guide clinical treatment in elderly patients with comorbidities.[9-12] Several studies using real-world data indicated that a substantial proportion of lung cancer remained untreated and the rate of no-treatment was higher in older patients.[9-15] However, there have been few reports of annual clinical practice in limited cohorts of patients ≥ 80 years with lung cancer.[12,13]

The Hokushin region of Japan is composed of the Hokuriku region (Fukui, Ishikawa, and Toyama prefectures) and Nagano prefecture (Supplemental Figure 1). Japan has one of the oldest populations in the world, and Hokushin region also has one of the highest percentages of elderly residents ≥ 65 years in Japan (https://www.stat.go.jp/data/nihon/02.html). Therefore, we used data from the cancer registry of Hokushin region to obtain information on elderly patients. In the present study, we retrospectively surveyed data of patients with lung cancer using the Hokushin Ganpro Database and health care utilization data. We evaluated the epidemiology, stage distribution, and initial treatments in patients with lung cancer. In addition, we compared the treatment status between patients <80 years and ≥80 years in the Hokushin region to clarify the differences in real-world clinical status in patients of advanced age with lung cancer.

Materials and Methods

Hokushin Ganpro Database and Health Care Utilization Data

"Hokushin Ganpro" is the name of the educational program implemented by the Ministry of Education, Culture, Sports, Science and Technology of Japan (https://gan-pro.net/) to enable improved cancer treatment by training highly skilled health care professionals via cooperation among universities in the Hokushin region (Kanazawa University, Kanazawa Medical University, Shinshu University, University of Toyama, University of Fukui, and Ishikawa Prefectural Nursing University).

The Hokushin Ganpro Database is a regional cancer database created as a project of Hokushin Ganpro and built from the hospital-based cancer registry (HBCR) of designated cancer care hospitals. We recently launched an observational study of a regional cancer database from January 1, 2016, through December 31, 2017, as dataset 2 of the Hokushin Ganpro Database. Dataset 2 included health care utilization data, so called diagnosis procedure combination (DPC) survey data, in the Hokushin region. Collection of DPC data was performed as part of a governmental survey to assess the effects of the introduction of the diagnostic procedure combination-based payment system. The DPC included information equivalent to fee-for-service insurance claims that cover all billable health services (eg, diagnostic tests, imaging workup procedures, treatments, and prescribed drugs) for both inpatients and outpatients. DPC were linked to the HBCR data of each patient in the participating hospitals. The Hokushin region has 28 designated cancer care hospitals in which approximately 35,000 people are diagnosed with cancer and registered every year. In Hokushin Ganpro dataset 2, 22 hospitals participated (20 of designated cancer care hospitals and 2 of general hospitals, Supplemental Table 1). However, DPC data in 1 hospital was inadequate for the analysis, so analysis of stage distribution and initial therapy using HBCR data was performed with data from 22 hospitals, while matching analysis of agents used during chemotherapy and comorbidities was performed with data from 21 hospitals.

In the present study, the definition of malignancy corresponded to behavioral codes 2 or 3 in the International Classification of Disease for Oncology, 3rd edition (ICD-O-3). All targeted lung cancers newly encountered at hospitals from January 1, 2016, to December 31, 2017, were registered. We analyzed the patients in Class of *Cases 20* and *30*. These are coded as 20 (diagnosed and treated in the registering hospital) and 30 (diagnosed in another hospital and treated in the registering hospital), respectively. The histological types and the codes for lung cancer included small cell lung cancer (SCLC) (codes 80413, 80453), adenocarcinoma (codes 81402, 81403, 81413, 82003, 82113, 82303, 82503, 82523, 82533, 82543, 82553, 82603, 82633, 82653, 83103, 84803, 84813, 85503, 85513), squamous cell carcinoma (codes 80523, 80702, 80703, 80713, 80723, 807433, 80823, 80833), neuroendocrine tumors (codes 80133, 82403, 82463, 82493), large cell carcinoma (codes 80123), adenosquamous cell carcinoma (code 85603), and others (codes 80003, 80013, 80102, 80103, 80203, 80223, 80313, 80323, 80333, 80463, 84303, 85743, 89723). Initial agents as first-line chemotherapy and therapy lines were examined using a combination of HBCR and DPC data. In addition, comorbidities in each patient were examined focusing on diabetes mellitus, cardiovascular diseases (cerebral infarction, heart disease), respiratory diseases (chronic obstructive pulmonary disease, pulmonary fibrosis), renal failure, and other cancers. Other cancers included coexistence of another cancer or past medical history of any cancers. The interval of DPC data corresponding to HBCR in the Hokushin Ganpro Database was selected from October 1, 2015, to July 31, 2017. National data were drawn from the National Cancer Registry [2].

This study was approved by the Institutional Review Board of Shinshu University School of Medicine (No.5054) and institutional review board approval was obtained from each participating facility for creation of the database. The dataset was used with permission from the Data Utilization Committee of Hokushin Ganpro Database Project. Pearson's χ^2 test and Fisher's exact test were used

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Table 1 Numbers of Lung Cancer Cases in the Hokushin Region, 2016 to 2017 According to Clinical Stage

	Non-Small Cell Lung Cancer			Small Cell Lung Cancer		
Stage	**< 80**	**≧ 80**	**Total**	**< 80**	**≧ 80**	**Total**
I Male/	2078 (52.5%)	457 (41.6%)	2535 (50.1%)	29 (8.1%)	8 (10.9%)	37 (8.7%)
Female	1171 907	271 186		27 2	7 1	
II Male/	298 (7.5%)	89 (8.1%)	387 (7.7%)	23 (2.1%)	9 (12.3%)	32 (7.6%)
Female	238 60	72 17		21 2	8 1	
III Male/	532 (13.4%)	122 (11.1%)	654 (12.9%)	96 (26.7%)	18 (24.7%)	114 (27.0%)
Female	435 97	98 24		80 16	15 3	
IV Male/	1006 (25.4%)	365 (33.3%)	1371 (27.1%)	200 (57.1%)	37 (50.7%)	237 (56.0%)
Female	717 289	231 134		170 30	30 7	
Unknown Male/	47 (1.2%)	64 (5.8%)	111 (2.2%)	2 (0.5%)	1 (1.4%)	3 (0.1%)
Female	35 12	39 25		2 0	1 0	
Median age (range)	69.9 (27.4~79.9)	84.1 (80.0~102.6)		70.4 (33.6~79.8)	83.3 (80.0~91.6)	
Total	3961	1097	5058	350	73	423

to compare the baseline and clinical characteristics between the < 80 years and ≥ 80 years groups. Propensity score matching (PSM, 1:1) was performed with a caliper of 0.2 to obtain matched pairs. A logistic regression model including age, sex, stage, histology, presence or absence of comorbidities, and numbers of comorbidities was used to calculate the propensity scores for the matched cohorts. Statistical analysis was performed using NZR Statistics. In all analyses, $P < .05$ was taken to indicate statistical significance.

Results

Patients

A total of 5481 patients with a mean (range) age of 76.9 (27-103) years were registered in the Hokushin area. Table 1 shows the numbers of lung cancer patients according to clinical stage in this study. These patients consisted of 5058 (92.3%) with NSCLC and 423 (7.7%) with SCLC, and 4311 (78.7%; 3961 in NSCLC, 350 in SCLC) were <80 years and 1170 (21.3%; 1097 in NSCLC and 73 in SCLC) were ≥ 80 years. The sex distributions according to each clinical stage are shown in Table 1. There were no significant differences in male/female ratio between the < 80 and ≥ 80 years groups in either NSCLC or SCLC subgroups. However, the ≥ 80 years group with NSCLC included a greater number of cases with unknown stage compared with the < 80 years group. With regard to stage distribution, stage I (50.1%) accounted for the majority of cases followed by stage IV (27.1%) in NSCLC, while stage IV (56.0%) and stage III (27.0%) were most common in SCLC.

Initial Therapy

Analyses of initial therapies for lung cancer and comparisons between < 80 and ≥ 80 years groups are shown in Figures 1 and 2. With regard to stage I NSCLC, the frequencies of surgery were 90.0% and 60.2% in the < 80 years and ≥ 80 years groups, respectively. The rate of radiotherapy was higher in stages I and II in the ≥ 80 years group compared with the < 80 years group. Best supportive care (BSC; no specific treatment) was selected in 188 stage IV NSCLCs (18.7%) in the <80 yo group. In contrast, the incidences of BSC were high in the ≥ 80 years group: 23.4% in stage I, 29.2% in stage II, 38.5% in stage III, and 58.9% in stage IV. In SCLC in the < 80 years group, 1 case in stage II (4.3%), 4 cases in stage III (4.2%) and 13 cases in stage IV (6.5%) were treated with BSC. However, in SCLC in the ≥ 80 years group, 1 case in stage I (12.5%) and 16 cases in stage IV (43.2%) were treated with BSC.

Comorbidities and Treatment Choice

We analyzed comorbidities in the present study using DPC data and the results are summarized in Table 2. The most common comorbidity was diabetes mellitus in 1500 cases (25.4%) followed by other cancers (871 cases, 14.7%), and respiratory diseases (607 cases, 10.3%). There were 188 patients with NSCLC and 22 patients with SCLC with more than 3 comorbidities. We compared the frequencies of BSC or receiving any treatment between groups. The rate of BSC was significantly higher in the ≥ 80 years group than the < 80 years group in both NSCLC and SCLC (Table 3). In addition, there were no significant differences between patients with and without comorbidities in the choice of BSC or receiving any treatment in both NSCLC and SCLC. In the analysis of propensity score matching, 979 cases of lung cancer (NSCLC + SCLC) were selected in both < 80 and ≥ 80 years groups, respectively. The rate of BSC was significantly higher in the ≥ 80 years group than the < 80 years group ($P < .042$) (Table 4). In NSCLC, BSC in the ≥ 80 years group was significantly higher than that in the < 80 ($P < .009$) by using propensity score matching, however, there was no significant differences in SCLC (data were not shown).

Initial Agents as First-Line Chemotherapy and Therapy Lines

We selected the data from patients receiving chemotherapy with and without radiotherapy. Table 5 shows the chemotherapeutic drugs used for initial treatment of lung cancer. In the Hokushin region, cisplatin-based chemotherapy was used in 16.5% of cases of NSCLC and 36.4% of cases of SCLC in the < 80 years group, but in no cases of either NSCLC or SCLC in the ≥ 80 years group. Carboplatin-based chemotherapy was administered in 44.1% of NSCLC cases and 58.1% of SCLC cases in the < 80 years group, while these proportions were 13.3% and 93.5%, respectively, in the ≥ 80 years group. Non-platinum-based monotherapy was selected

Figure 1 Proportion of initial therapies according to clinical stage and comparison between < 80 years and ≥ 80 years groups with NSCLC in Hokushin region.

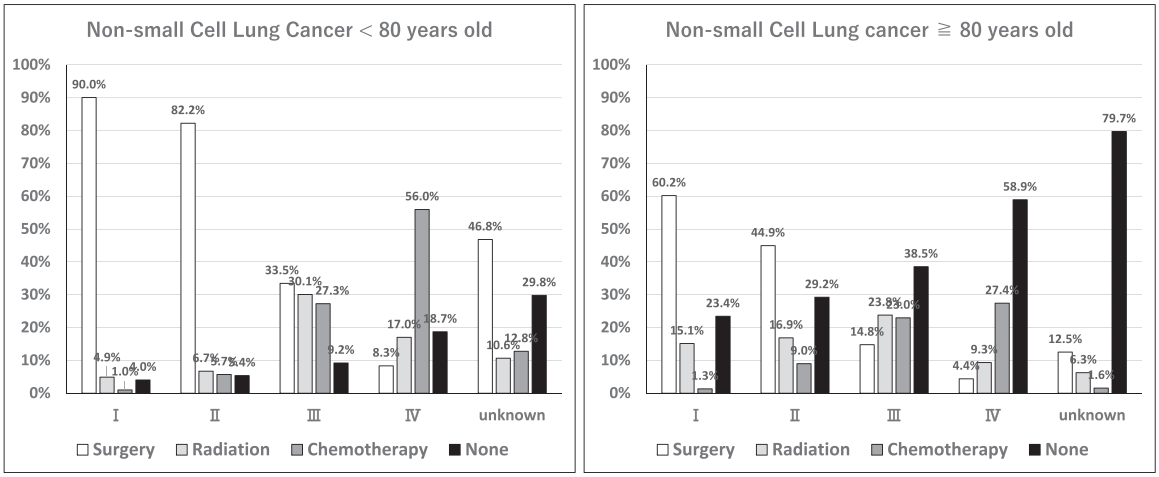


Figure 2 Proportion of initial therapies according to clinical stage and comparison between < 80 years and ≥ 80 years groups with SCLC in Hokushin region.

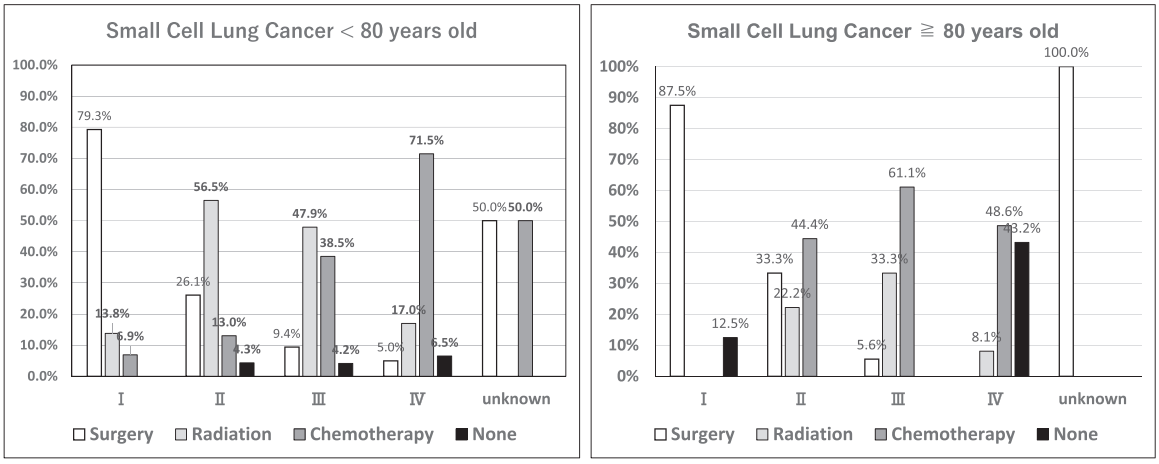


Table 2 Comorbidities in Patients With Non-Small Cell Lung Cancer and Small Cell Lung Cancer in the Present Study

Comorbidity	Non-Small cell Lung Cancer		Small Cell Lung Cancer		Total
	< 80	≧ 80	< 80	≧ 80	
Diabetes mellitus	1080 (25.1%)	275 (24.3%)	129 (31.8%)	16 (21.1%)	1500 (25.4%)
Other cancers	648 (15.1%)	176 (15.6%)	38 (11.8%)	9 (11.8%)	871 (14.7%)
Respiratory diseases	433 (10.1%)	114 (11.1%)	54 (13.3%)	6 (7.9%)	607 (10.3%)
Cardiovascular diseases	374 (8.7%)	147 (13.0%)	44 (11.9%)	15 (19.7%)	580 (9.8%)
Renal disease	115 (2.7%)	52 (4.6%)	16 (4.0%)	9 (11.8%)	192 (3.3%)
None	1646 (38.3%)	365 (32,3%)	124 (30.6%)	21 (27.6%)	2156 (36.5%)
Total	4296	1129	405	76	5906[a]

[a] There were duplicates

Table 3 Treatment Choice of Best Supportive Care or Receiving any Treatment According to the Presence/Absence of Comorbidities in Patients With Non-Small Cell Lung Cancer and Small Cell Lung Cancer in the Present Study

	Non-Small Cell Lung Cancer			Small Cell Lung Cancer		
Comorbidity (-)	**< 80**	**≧ 80**		**< 80**	**≧ 80**	
Best supportive care	113 (6.9%)	138 (37.8%)	$P < .0001$	8 (6.5%)	6 (28.6%)	$P < .0001$
Any treatment	1533 (93.1%)	227 (62.2%)		116 (93.5%)	15 (71.4%)	
Total	1646	365	2011	124	21	145
Comorbidity (+)	< 80	≧ 80		< 80	≧ 80	
Best supportive care	174 (9.3%)	195 (37.9%)	$P < .0001$	9 (4.6%)	10 (25.0%)	$P < .0001$
Any treatment	1693 (90.7%)	320 (62.1%)		186 (95.4%)	30 (75.0%)	
Total	1867	515	2382	195	40	235

Table 4 Analysis by Propensity Score Matching Between < 80 and ≥ 80 Year Patients With Lung Cancer

After matching		**<80 y**	**≥80 y**	***P*-value**
Number of patients		979 (100)	979 (100)	
Sex	Male	659 (67.3)	655 (66.9)	.885
	Female	320 (32.7)	324 (33.1)	
Histology	NSCLC	899 (91.8)	892 (91.1)	.627
	SCLC	80 (8.2)	87 (8.9)	
Tumor stage	I	423 (43.2)	426 (43.5)	.995
	II	67 (6.8)	69 (7.1)	
	III	167 (17.1)	164 (16.8)	
	IV	322 (32.9)	320 (32.7)	
Number of comorbidities	0	438 (44.7)	438 (44.7)	.904
	1	363 (37.1)	356 (36.4)	
	≥2	178 (18.2)	185 (18.9)	
Comorbidity	Diabetes mellitus	339 (34.6)	339 (34.6)	.887
	Respiratory diseases	110 (11.2)	105 (10.7)	.773
	Coronary diseases	101 (10.3)	114 (11.6)	.31
	Renal diseases	37 (3.8)	44 (4.5)	.496
	Other cancers	176 (18.0)	173 (17.7)	.906
Treatment	Any treatment	849 (86.7)	816 (83.4)	.042
	Best supportive care	130 (13.3)	163 (16.6)	

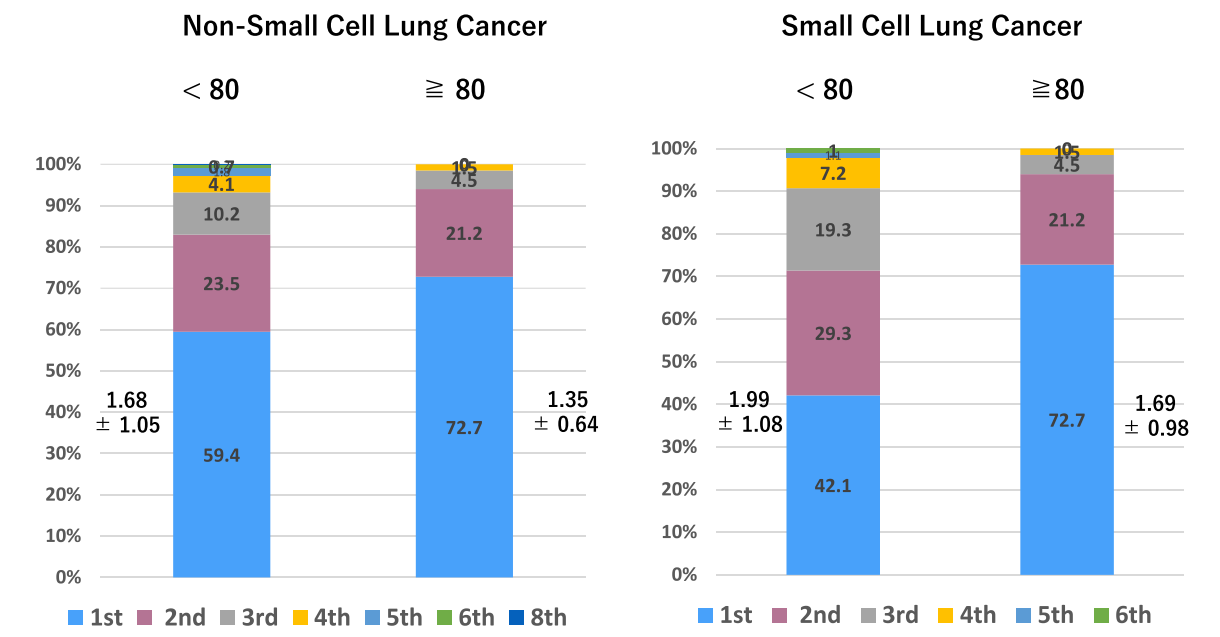
Table 5 Initial Regimen in Patients Receiving Chemotherapy

	Non-Small Cell Lung Cancer		Small Cell Lung Cancer		Total
	< 80	**≧ 80**	**< 80**	**≧ 80**	
CDDP-based chemotherapy	154 (16.5%)	0	94 (36.4%)	0	242
CBDCA-based chemotherapy	411 (44.1%)	20 (13.3%)	150 (58.1%)	29 (93.5%)	605
CBDCA only	10 (1.1%)	8 (5.3%)	0	0	24
Non-platinum monotherapy	79 (8.5%)	47 (31.3%)	14 (5.4%)	2 (6.5%)	142
Immuno-check point inhibitor	79 (8.5%)	8 (5.3%)			87
Molecular targeted therapy	198 (21.3%)	67 (44.7%)			265
Total	931	150	258	31	1370

Abbreviations: CBDCA; carboplatin; CDDP, cisplatin

in 8.5% of cases in the < 80 years group and 31.5% of cases in the ≥ 80 years group with NSCLC. The ratio of molecular targeted therapy, including epidermal growth factor receptor (EGFR) and anaplastic lymphoma kinase (ALK) tyrosine kinase inhibitors, was higher in the ≥ 80 years group than the < 80 years group (44.7% vs. 21.3%, respectively). The proportion of patients receiving immune checkpoint inhibitors (ICIs) was similar in the 2 groups. Therefore, the proportion of patients treated with biomarker-targeted agents (EGFR and ALK inhibitors + ICIs) was significantly higher in the ≥ 80 years group than the < 80 years group (Figure 3). Non-

Figure 3 Proportion of therapy types in < 80 years and ≥ 80 years groups with NSCLC and SCLC in Hokushin region.



platinum-based monotherapy as first-line treatment was also used in a large proportion of patients in the ≥ 80 years group (31.3%) with NSCLC. Non-platinum single agents including S-1, pemetrexed, and docetaxel were used to treat 126 cases of NSCLC, while etoposide and irinotecan were used as monotherapy in 16 cases of SCLC. In this analysis, 18 patients (10 in the < 80 years group and 8 in the ≥ 80 years group) were treated with daily carboplatin combined with thoracic radiotherapy for stage III NSCLC.[16]

We analyzed therapy lines of throughout chemotherapy done during the study interval in each patient and the frequencies were graphed in Figure 3. Therapy lines in the < 80 years group were longer than those in the ≥ 80 years group in both NSCLC (1.68 ± 1.05 vs. 1.35 ± 0.64, respectively) and SCLC (1.99 ± 1.08 vs. 1.69 ± 0.98, respectively), but the differences were not significant.

Discussion

Here, we examined the epidemiology and patterns of initial treatment in lung cancer in patients ≥ 80 years using the Hokushin Ganpro dataset 2, which consisted of HBCRs and DPCs, to clarify the real-world clinical status of elderly lung cancer patients in the Hokushin region.

In NSCLC, the mean stage I detection rate in the Hokushin region (51.6%) was slightly higher than the Japan national average (46.2%)[2] and surgical resection was performed in 90% of cases of stage I NSCLC in the < 80 years group. Surgical resection for early-stage lung cancer was reported to be the best treatment.[6,7] However, surgery often cannot be performed in elderly patients, especially those with comorbidities making them unsuitable for surgery, because of the increased surgery-related mortality and morbidity risks.[17,18] In the present study, the rates of surgical treatment were lower (60.2% in stage I and 44.9% in stage II) and rates of radiotherapy and no treatment were higher in the ≥ 80 years group than the < 80 years group. Lee et al.[12] examined the real-world treatment patterns in patients ≥ 80 years with early-stage lung cancer in South Korea, and reported that the percentage of patients treated with stereotactic body radiation therapy (SBRT) increased, while that of patients treated with surgery decreased gradually over time since 2008, although the SBRT group showed poorer overall survival than the surgical group. Although the changes in treatment pattern for early-stage lung cancer remained unclear in the present study, our data indicated real-world clinical practice in lung cancer patients ≥ 80 years.

On the other hand, the rate of BSC was high in the ≥ 80 years group in the present study. It is noteworthy that our data showed selection of BSC in 58.9% of cases of stage IV NSCLC and 43.2% of cases of stage IV SCLC in the ≥ 80 years group. Fukushima et al.[12] retrospectively analyzed 132 Japanese patients aged ≥ 80 years with advanced NSCLC and reported that 57% of patients did not receive chemotherapy, which was similar to the frequency in the present study. Therefore, our data taken together with the study of Fukushima et al. likely reflect the real-world clinical status of advanced elderly patients with lung cancer in Japan.

In addition, the choice of BSC in lung cancer patients was significantly related to age ≥ 80 years regardless of the presence or absence of comorbidities. This was confirmed by analysis using propensity score matching, especially in patients with NSCLC, suggesting that advanced age (≥ 80 years) itself is closely related to the choice of no treatment. Our findings regarding BSC in patients with lung cancer are clinically important for understanding the circum-

stances around lung cancer in this region. With the aging of society in Hokushin region (https://www.stat.go.jp/data/nihon/02.html), implementation of lung cancer screening and control in elderly patients should be considered.

The 2016 Guideline for Treatment of Lung Cancer of The Japan Lung Cancer Society recommends testing patients with non-squamous NSCLC for multiple biomarkers, including *EGFR* gene mutation, *ALK* fusion, and programmed death-ligand 1 (PD-L1) expression.[7] Biomarker-matched therapy with molecular targeted agents or ICIs was performed in 32.8% and 7.3% of patients in the ≥ 80 years group, respectively, which were significantly higher than the rates in the < 80 years group. These findings may have been due to the lower rate of cytotoxic chemotherapy and higher rate of BSC in the ≥ 80 years group than the < 80 years group. However, we believe that the appropriate diagnostic approach for biomarker testing could be performed even in very elderly patients with lung cancer in Hokushin region, although we were unable to examine the biomarker testing rate in clinical practice in the present study. As several studies indicated that biomarker-matched therapy was related to prolonged survival even in very elderly NSCLC patients,[19,20] testing of biomarkers should not be neglected even in elderly patients with lung cancer.

Despite the valuable findings, this study had several limitations. First, it was carried out in a domestic institution based on cancer registration data. Therefore, smoking history, survival information, patient performance status, and therapeutic effects were unclear. Second, the Hokushin Ganpro Database does not necessarily contain all HBCR data from the Hokushin region. Therefore, our study was unable to determine the real-world practice regarding lung cancer in this region. Third, the interval of data sampling in Hokushin Ganpro dataset 2 was only 2 years, which may have been insufficient to evaluate the epidemiological trends in lung cancer. Nevertheless, we applied DPC survey data corresponding to each registered case in the Hokushin Ganpro dataset in the present study. We evaluated clinical practice focusing on elderly patients with lung cancer, and our findings represent further informative data of real-world status in lung cancer patients ≥ 80 years in the Hokushin region.

Conclusion

We presented the epidemiological and clinical situation in patients with lung cancer in Hokushin region and described the differences in treatment status between patients < 80 years and those ≥ 80 years. Rates of treatment with best supportive care for stage IV disease were significantly higher in the ≥ 80 than the < 80 year group, regardless of the presence/absence of comorbidities. The results presented here could help in developing future strategies for lung cancer control and screening in elderly patients. The cancer registry system, including health care utilization data, provides useful information regarding the actual clinical situation.

Clinical Practice Points

- Although a number of studies focusing on elderly lung cancer patients have been conducted with regard to several types of therapy, the median age of enrolled patients was less than 80 years. There is a paucity of information about the epidemiology, initial treatment, and clinical practice in lung cancer patients aged 80 years and older.
- We surveyed data of newly diagnosed patients with lung cancer in a registration database built from the hospital-based cancer registry and Diagnosis Procedure Combination data in Hokushin region, Japan. We found that there were several differences in the stage distribution and initial therapy between patients < 80 years ≥ 80 years. The frequency of no treatment BSC in patients ≥ 80 years was significantly higher than in patients < 80 years. Propensity score matching analysis including sex, stage, and comorbidities indicated that age over 80 years itself is significantly related to the choice of BSC in patients with lung cancer in the Hokushin region.
- The cancer registry system combined with DPC is a valuable resource for evaluating clinical practice and management.

Disclosure

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.cllc.2022.12.001.

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