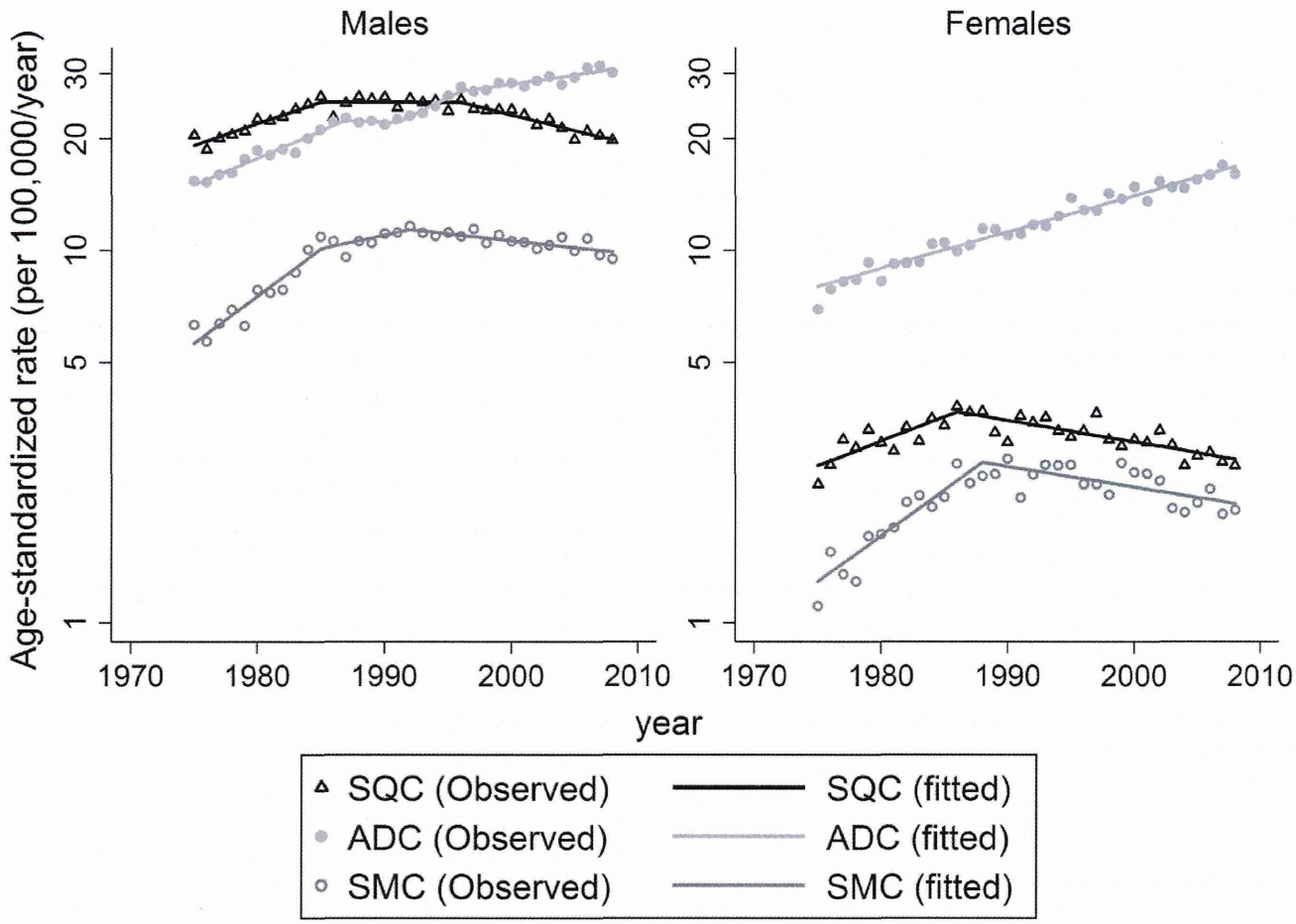

Figure 2. Trends in age-standardized incidence rates of lung cancer by histological type in Osaka, Japan 1975 to 2008. ADC, adenocarcinoma; SMC, small cell carcinoma; SQC, squamous cell carcinoma.

Table 3. Trends in age-standardized incidence rates of lung cancer by histological type with joinpoint analysis in Osaka, Japan

Histological type	Trend 1			Trend 2			Trend 3			Trend 4		
	Years	APC	(95% CI)	Years	APC	(95% CI)	Years	APC	(95% CI)	Years	APC	(95% CI)
Males												
Squamous cell carcinoma	1975–1985	2.7[a]	(1.7, 3.7)	1985–1996	0	(−0.8, 0.7)	1996–2008	−1.9[a]	(−2.4, −1.5)			
Adenocarcinoma	1975–1987	3.4[a]	(2.7, 4.1)	1987–1991	−0.4	(−4.8, 4.3)	1991–1996	4.0[a]	(1.4, 6.6)	1996–2008	1.1[a]	(0.8, 1.5)
Small cell carcinoma	1975–1985	6.0[a]	(4.5, 7.6)	1985–1992	1.7	(−0.6, 4.1)	1992–2008	−0.9[a]	(−1.3, −0.4)			
Females												
Squamous cell carcinoma	1975–1986	3.1[a]	(1.4, 4.8)	1986–2008	−1.3[a]	(−1.7, −0.9)						
Adenocarcinoma	1975–2008	2.3[a]	(2.1, 2.5)									
Small cell carcinoma	1975–1988	5.8[a]	(3.9, 7.8)	1988–2008	−1.3[a]	(−1.9, −0.7)						

APC, annual percentage change; CI, confidence interval.
[a]APC is statistically significantly different from zero ($P < 0.05$).

cancer registries in Japan, stage at diagnosis is classified into three categories: localized, regional metastases (regional lymph nodes and adjacent organs), and distant metastasis. The proportion of patients with localized cancer slightly increased from the 1990s, especially in females. Moreover, the proportion of patients with ADC was higher in females than males (Table 1). The gender differences in the distribution of histological type and stage of lung cancer might reflect different trends in incidence and mortality between genders.

Cigarette smoking and trends in the incidence rates of SQC and SMC

It is known that the incidence of SQC and SMC is more closely related to smoking behaviors than that of ADC.[19,20] Japanese smoking prevalence decreased from the 1960s for both genders (from 82.3% in 1965 to 38.9% in 2009 for males, and from 15.7% in 1965 to 11.9% in 2009 for females) (eFigure 4).[21] The continuous decrease in the incidence of SQC and SMC is thought to be due to the decline in smoking prevalence.

Although the incidence rates of SQC and SMC decreased for both genders, the rates among females in the younger age group (35–64 years) levelled off (eFigure 1 and eFigure 3). Smoking prevalence among females in their 20s and 30s increased from 1965 and almost levelled off at about 17–23% in 1990–2008.[21] It was reported that the prevalence of ever smoking by birth cohort among Japanese females continuously increased from the 1930s birth cohort and exceeded 20% by the 1973 birth cohort. Moreover, it was also reported that the mean age of smoking initiation among females declined noticeably during this period.[22] The high smoking prevalence among females who were born after the 1960s is possibly related to the stable trends of SQC and SMC among females in the younger age group (35–64 years). The above findings suggest that it is necessary to monitor the incidence rates of SQC and SMC and to reduce smoking prevalence, especially in younger females.

Smoking prevalence for males in Osaka is almost the same as for Japan as a whole (Osaka: 48.1% in 2001 and 33.6% in 2010; Japan as a whole: 48.4% in 2001 and 33.1% in 2010), while it is a little higher among females in Osaka (Osaka: 15.7% in 2001 and 12.3% in 2010; Japan as a whole: 14.0% in 2001 and 10.4% in 2010).[23] It is possible that the impact of smoking on lung cancer incidence is greater for females in Osaka.

Trends in the incidence rates of ADC

The incidence rate of ADC showed an increasing trend among all the age groups for both genders except for males in the 65–74 years age group (eFigure 2). An increase in incidence of ADC has been reported worldwide, especially for females in developed countries. However, the determining factor for the increase in ADC remains unclear.[24] It has been suggested the switching from non-filtered cigarettes to filtered cigarettes in the 1960s is related to the increase in ADC and decrease in SQC and SMC.[25] However, smoking prevalence has decreased since the 1960s, except among younger females, and cigarette consumption per capita has levelled off and then decreased since the late 1970s (eFigure 4).[21,26] Therefore, it is difficult to explain the increase in ADC incidence by smoking trends alone. One study has estimated the latency period between exposures to filter cigarettes and ADC development to be about 25 years,[25] while another study suggested that it could be more than 30 years if cigarette consumption played a major role in development of ADC.[27] If the latency period was about 30 years, the incidence rate of ADC in Osaka would be expected to have begun to level off or decrease from the 2000s.

On the other hand, ADC is the most common type of lung cancer in lifelong non-smokers.[28,29] Specific gene mutations, such as EGFR mutations, might be related to the relationship between ADC and never smokers. It has been reported that EGFR mutations are more frequent in females, patients with ADC, never smokers, and people of East Asian ethnicity.[30] The higher percentage of never smokers among females than males is probably one reason why the incidence of ADC increased more steeply for females than males. Passive smoking is also considered to be a risk factor for lung cancer,[31] and an association has been clearly identified for ADC incidence (HR 2.03; 95% CI, 1.07–3.86).[32] It is necessary to monitor trends in ADC and investigate the association between smoking and ADC incidence, with consideration of various factors, such as different distributions of EGFR mutations between ethnicities, smoking patterns, and genders.

Another possible risk factor for lung cancer is air pollution.[33] Long-term exposure to NOx has been reported as a possible cause for a temporal increase in ADC incidence in the United States.[34] According to a survey by the Japanese government, annual average concentrations of SO_2 and SPM have decreased since the 1970s, while NO_2 concentration has levelled off and slightly decreased from the 2000s (eFigure 4).[35] Therefore, air pollution is not likely to be a major reason for the increased incidence rates of ADC.

Comparison with the results of other studies

Our study confirmed the increase in incidence of ADC and the decrease in incidence of SQC and SMC in Osaka, which has already been shown by a previous study.[6] According to a study of nine population-based prefectural cancer registries in Japan,[25] incidence rates of SQC have recently decreased for both genders, which is consistent with our results in Osaka. However, the incidence of ADC in males has levelled off (APC 0.2%; 95% CI, −1.6% to 1.9%) since 1998, which is different from the results in Osaka. It seems that there are some differences in trends for lung cancer incidence between Osaka and other prefectures, especially for ADC.

According to lung cancer trends by histological type in other countries,[36] incidence rates of SQC and SMC decreased for males and incidence of ADC increased for females in North America, Australia, and several European countries. Nevertheless, there were some differences. In North America, Australia, Denmark, and Iceland, incidence rates of ADC for males and lung cancer for all histological types for females levelled off, while in the other European countries, as in Osaka, incidence of ADC in males and lung cancer of all histological types in females increased. This is probably because smoking prevalence for both genders in North America, Australia, Denmark, and Iceland was lower and declined more sharply between 1980 and 2012 than in other countries, including Japan.[37,38] Regarding trends in Hong Kong and Tianjin, China,[39,40] incidence rates of lung cancer significantly decreased for both genders after the 1980s and 1990s, respectively. In these two regions, ADC incidence levelled off or decreased and SQC incidence has decreased recently for both genders. However, male smoking prevalence in China among adults aged 15 or above was high and has decreased slowly (61% in 1984 and 52.9% in 2010).[41,42]

Although smoking is closely associated with lung cancer incidence, it appears that we cannot fully understand trends in lung cancer by trends in smoking prevalence alone. Interpreting these trends more accurately requires that we also study the influence of the spread of cancer screening or exposure to other risk factors on lung cancer incidence.

Limitations

There are several limitations to the present study. The OCR included cases with unspecified histological diagnosis. Although the percentage of cases without histological diagnosis decreased over the years, about one-third of the cases had an unspecified histological diagnosis in 2005–2008 (Table 1). We used the MI approach to solve this problem. However, when we use the MI approach, the mechanism of missingness should be missing at random, where the chance of data being missing is independent of unseen values.[10,43] Although we assumed that this was the case for the data from OCR, it is difficult to test whether or not this assumption is valid.

The quality of cancer registry data is usually determined using the proportion of death certificate only (DCO) cases and microscopic verified (MV) cases (DCO% and MV%).[8] For the OCR, DCO% and MV% of all cancers are as follows[44]: DCO% in 1987, 1997, and 2007 were 24%, 15%, and 11.6% for males and 21.1%, 14%, and 11.8% for females, respectively; MV% in 1992, 1997, and 2007 were 70%, 70%, and 77.6% for males and 73%, 72%, and 75.8% for females, respectively. DCO% of the OCR has improved over these periods, which might have influenced trends in incidence rates of lung cancer. It was difficult to evaluate the influence of these factors in our analysis.

Conclusion

In this study, we investigated trends in incidence and mortality rates of lung cancer and incidence rates by histological type and age group. The incidence rates of SQC and SMC decreased with the decline in smoking prevalence, which probably led to the change in trends in lung cancer incidence rates from the mid-1980s. It was difficult to explain why the incidence rates of ADC continued to increase for both males and females. Therefore, subsequent studies should carefully monitor trends in lung cancer incidence by histological type, especially trends for ADC. The relationship between the incidence of ADC and its possible risk factors also warrants clarification.

ONLINE ONLY MATERIALS

eTable 1. Trends in truncated age-standardized incidence rates for squamous cell carcinoma with joinpoint analysis.
eTable 2. Trends in truncated age-standardized incidence rates for adenocarcinoma with joinpoint analysis.
eTable 3. Trends in truncated age-standardized incidence rates for small cell carcinoma with joinpoint analysis.
eFigure 1. Trends in truncated age-standardized incidence rates of squamous cell carcinoma in Osaka, Japan from 1975 to 2008.
eFigure 2. Trends in truncated age-standardized incidence rates of adenocarcinoma in Osaka, Japan from 1975 to 2008.
eFigure 3. Trends in truncated age-standardized incidence rates of small cell carcinoma in Osaka, Japan from 1975 to 2008.
eFigure 4. Trends in age-standardized incidence rates of lung cancer by histological type in Osaka from 1975 to 2008, with trends in smoking prevalence and average concentration of SO_2, NO_2, and SPM.
Abstract in Japanese.

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Conflicts of interest: None declared.

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The 29th Lung Cancer Mass Screening Seminar

肺がん生存率の国際比較

伊藤ゆり[1]・中山富雄[1]

International Comparison of Survival from Lung Cancer

Yuri Ito[1]; Tomio Nakayama[1]

[1]Department of Cancer Epidemiology and Prevention, Center for Cancer Control and Statistics, Osaka Medical Center for Cancer and Cardiovascular Diseases, Japan.

ABSTRACT —— ***Objective.*** According to the CONCORD study, the worldwide surveillance of cancer survival, five-year net survival of Japanese lung cancer patients is 30.1%, the highest among developed countries in 2005-2009. We aimed to examine the factors accounting for why the survival of lung cancer in Japan is higher than that observed in other countries. ***Methods.*** We analysed population-cancer registry data obtained in Japan (J-CANSIS data, collaborative study of six prefectural registries) and compared lung cancer survival based on the Japanese data with those obtained from the ICBP (International Cancer Benchmarking Partnership, Australia, Canada, Denmark, Norway, Sweden and UK participating nations) data. We also examined differences in survival and the distribution of prognostic factors, such as sex, stage, and histological type. ***Results.*** In Japan, the 10-year relative survival was higher in women than in men and improved significantly in women. Compared with the ICBP results, the one-year survival of non-small cell and small cell lung cancer in Japan was higher than that seen in the ICBP countries. The difference in the one-year survival of non-small cell lung cancer was large, and notable differences were observed in the stage-specific analysis. The rate of adenocarcinoma in the non-small cell lung cancer patients in Japan was also larger than that observed in the ICBP countries, whereas fewer cases of distant metastasis were noted in the ICBP countries. ***Conclusions.*** The early detection of adenocarcinoma using CT scans in Japan may therefore positively contribute to the higher survival rates of lung cancer observed in Japan versus other countries.

(*JJLC.* 2015;55:266-272)

KEY WORDS —— Cancer survival, International comparison, Population-based cancer registry

要旨 —— **目的．**がん生存率の国際共同調査 CONCORD study（2005～2009 年診断症例）において，肺がんの 5 年相対生存率は，日本は 30.1% と特に高いことが示された．日本の肺がん患者の生存率が他国と比べて高い理由を検討する．**方法．**日本のがん患者の生存率共同調査（J-CANSIS）データの結果を精査するとともに，国際共同調査 ICBP の結果と比較する．進行度別，組織型別，年齢階級別に報告値を比較し，肺がん生存率の国際的な違いについて要因を検討する．**結果．**J-CANSIS データより，日本の肺がん患者の 10 年相対生存率は女性が男性より高く，著しく向上していた．ICBP 参加国との結果を比較すると，非小細胞肺がん，小細胞肺がんともに，日本の 1 年生存率は最も高い値を示した．非小細胞肺がんにおいては特に顕著で，進行度別にも差があった．日本の非小細胞肺がん患者は他国に比べて腺がんの占める割合が高く，遠隔転移例が少なかった．**結論．**日本の肺がん患者の生存率が他国と比べて高い理由としては，CT の普及による早期診断に伴う腺がんが多い点，また早期診断が多い点が考えられる．

索引用語 —— 生存率，国際比較，がん登録

[1]大阪府立成人病センターがん予防情報センター疫学予防課．

背　景

がん生存率の国際共同調査 CONCORD study（2005～2009 年診断症例）において，肺がんの 5 年相対生存率は，米国 18.7%，スウェーデン 15.6%，英国 9.6% と欧米諸国では軒並み 20% 未満であるのに対し，日本は 30.1% と，特に高いことが示された.[1]

日本のがん生存率共同調査 J-CANSIS（the Japanese CANcer Survival Information for Society）study では，男性での 5 年・10 年生存率の向上はわずかであるのに対し，女性での向上が大きかった.[2] 最新の 2002～2006 年の 10 年相対生存率では男性 18%，女性 31% と大きな性差が認められた.[3]

本研究では，国民皆保険制度があり，質の高いがん登録資料を有する国で実施されたがん患者の生存率に関する国際共同研究である International Cancer Benchmarking Partnership（ICBP）[4] の肺がん生存率の結果[5]を参照し，日本における肺がん患者の生存率が他国と比べて高い理由を検討することを目的とする．公表データのみでは比較可能性に限界はあるが，進行度別，組織型別，年齢階級別にも報告値を比較し，肺がん生存率の国際的な違いについて要因を検討する．

Table 1. Trends in 5- and 10-year Relative Survival Rates of Lung Cancer Patients in Japan (J-CANSIS Study)

	Years of diagnosis	Subjects	5-year RS	10-year RS
Men	1993-1997	21,418	19.8 [19.2-20.4]	15.7 [15.1-16.4]
	1998-2001	19,673	22.1 [21.5-22.8]	17.8 [17.1-18.5]
	2002-2006*	29,322	22.7 [22.2-23.3]	18.1 [17.4-18.7]
Women	1993-1997	8,059	26.2 [25.2-27.3]	22.2 [21.2-23.3]
	1998-2001	8,006	34.1 [32.9-35.2]	28.7 [27.5-29.8]
	2002-2006*	11,997	37.6 [36.6-38.5]	31.2 [30.1-32.3]

*Follow-up years for 10-year survival, as we applied a period analysis.
RS: relative survival.

Table 2. 5-year Relative Survival of Lung Cancer Patients in Japan by Sex and Histological Type (J-CANSIS, 2002-2006)

	Men				Women			
	N	%	RS (%)	95%CI	N	%	RS (%)	95%CI
Adenocarcinoma	8,264	40.0	29.1	[28.7-29.4]	5,541	64.0	45.0	[44.6-45.5]
Squamous cell carcinoma	5,609	27.1	22.5	[22.1-22.9]	822	9.5	19.5	[18.7-20.4]
Large cell carcinoma	1,155	5.6	14.9	[14.3-15.6]	276	3.2	15.9	[14.6-17.3]
Small cell carcinoma	2,645	12.8	8.3	[8.0-8.7]	604	7.0	7.9	[7.3-8.6]
Others	2,995	14.5	5.4	[5.2-5.7]	1,411	16.3	7.9	[7.4-8.4]
Total	20,668	100.0	20.6	[20.4-20.8]	8,654	100.0	33.5	[33.2-33.8]

CI: confidence interval.

Table 3. Rates of Histology Types of Lung Cancer in Japan According to the Stage at Diagnosis (J-CANSIS, 2002-2006)

	Localised				Regional				Distant			
	Men		Women		Men		Women		Men		Women	
	N	%	N	%	N	%	N	%	N	%	N	%
Adenocarcinoma	2,182	51.5	2,109	81.7	2,736	36.0	1,488	57.5	3,347	37.9	1,944	55.8
Squamous cell carcinoma	1,334	31.5	183	7.1	2,541	33.4	345	13.3	1,733	19.6	294	8.4
Large cell carcinoma	175	4.1	37	1.4	417	5.5	88	3.4	563	6.4	151	4.3
Small cell carcinoma	198	4.7	51	2.0	920	12.1	227	8.8	1,527	17.3	327	9.4
Others	344	8.1	203	7.9	994	13.1	440	17.0	1,657	18.8	768	22.0
Total	4,234	100.0	2,582	100.0	7,608	100.0	2,588	100.0	8,826	100.0	3,484	100.0

We applied multiple imputation for missing stages.

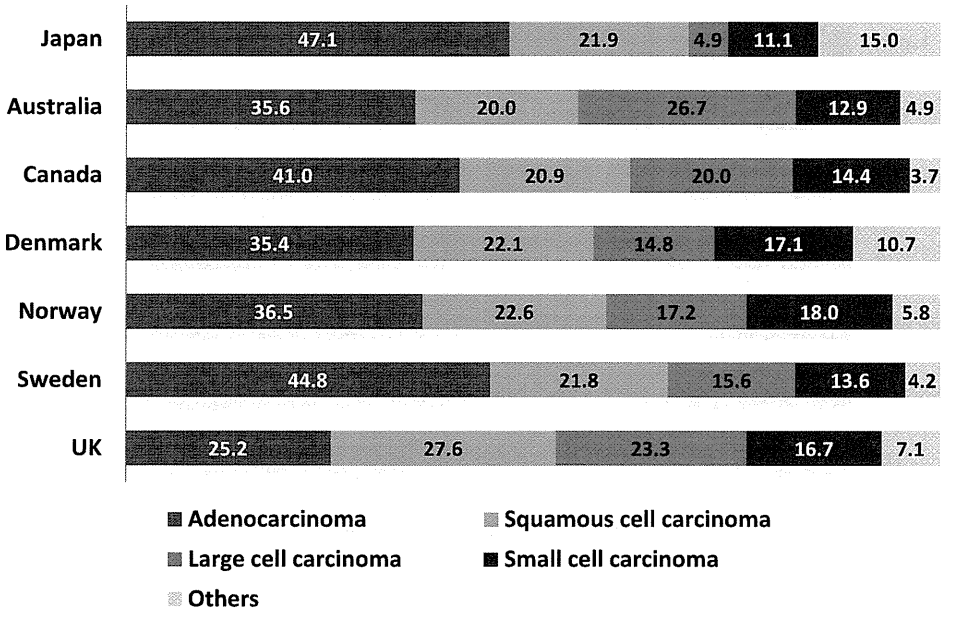

Figure 1. Distribution of the histological types of lung cancer.

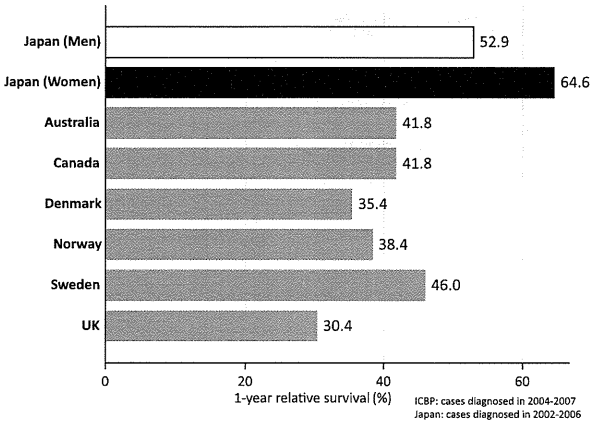

Figure 2. One-year relative survival of non-small cell lung cancer patients: all cases.

方　法

日本のがん患者の生存率の共同調査（J-CANSIS study）のデータを用いて，日本における肺がん生存率について整理し，ICBP でまとめられた他国の肺がん生存率の結果と比較する．

日本の肺がん生存率

J-CANSIS study は，平成 25 年度厚生労働科学研究費（第 3 次対がん総合戦略研究事業）「革新的な統計手法を用いたがん患者の生存時間分析とその情報還元に関する研究」班（H25-3 次がん-若手-008）において実施されたがん患者の長期生存率に関する共同研究である．この共同研究では長期にわたり精度の高い資料が収集されている 6 府県（山形県，宮城県，福井県，新潟県，大阪府，長崎県）における地域がん登録資料を用いてがん患者の生存率が様々な方法で分析された．1993～2006 年に診断された 15 歳以上の主要 23 部位および，小児（0～14 歳），Adolescents and Young Adults（AYA）世代（15～29 歳）の 4 種類のがんについて，性別，年齢階級別，診断時進行度別，診断時期別に 10 年生存率，サバイバー 5 年生存率（診断からの経過年数に応じたその後の生存率），治癒割合について分析・報告がなされた．[2,3] 本報告では，J-CANSIS study のデータから，我が国のがん患者の生存率を用いるとともに組織型別の分析をさらに追加した．

他国の肺がん生存率（ICBP より）

ICBP は，国民皆保険制度があり，がん登録の精度が高い 6 カ国（オーストラリア，カナダ，デンマーク，ノルウェー，スウェーデン，英国）が参加するがん患者の生存率に関する共同調査で，2004～2007 年に診断された乳房，大腸，肺，卵巣のがん患者についてデータを収集し，国別の生存率がなぜ異なるのかを明らかにする研究である．肺がんの生存率の詳細分析の結果が Walters らにより報告されているため，この結果を引用する．[5]

なお，診断時進行度は SEER（Surveillance, Epidemiology, and End Results）Summary Staging Manual 2000 に基づき，限局（がんが臓器内にとどまる，Localised），

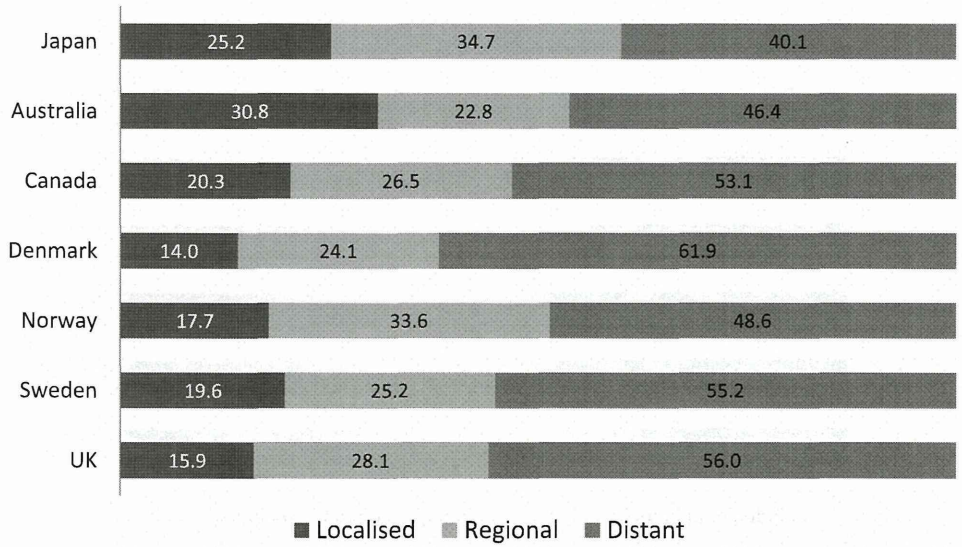

Figure 3. Stage distribution of non-small cell lung cancer patients.

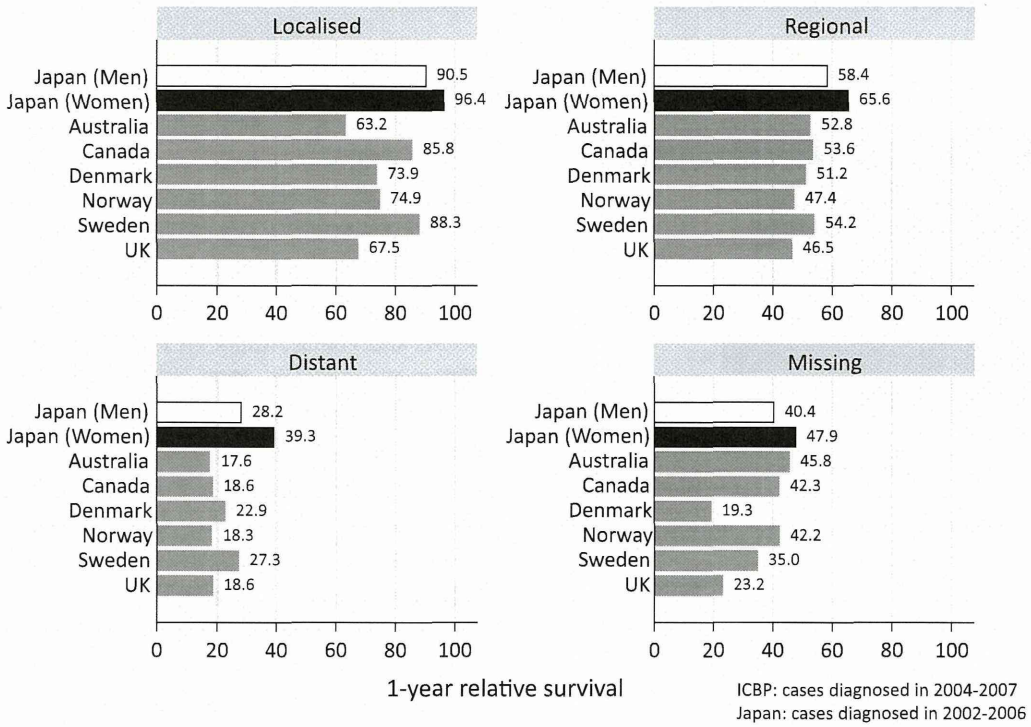

Figure 4. One-year relative survival of non-small cell lung cancer: by stage.

領域（リンパ節転移や隣接臓器への浸潤あり，Regional），遠隔転移（Distant）に分類されている．[6]

結　果

日本の肺がん生存率

J-CANSIS データより，日本の肺がん患者における性別，診断時期別の 5 年・10 年相対生存率の推移を Table

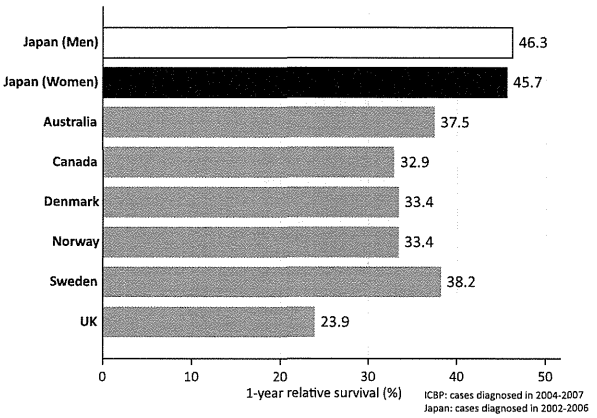

Figure 5. One-year relative survival of small-cell lung cancer patients: all cases.

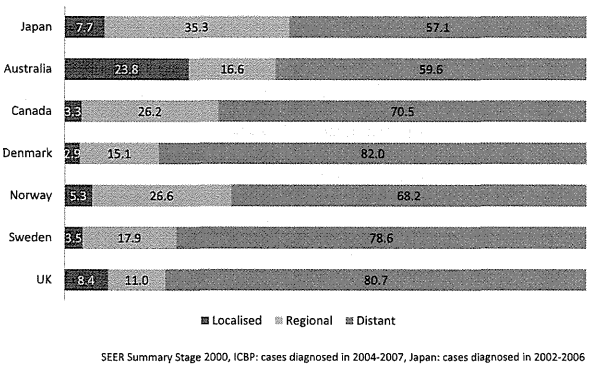

Figure 6. Stage distribution of small-cell lung cancer patients.

1に示した．1993～1997年から2002～2006年にかけて，男性では10年生存率が15.7%から18.1%にわずかに向上したのに対し，女性では22.2%から31.2%と大きく向上した．男性よりも女性の生存率が高かった．Table 2に示すように，性別に組織型の分布および組織型別5年相対生存率をみると，女性における腺がんが占める割合は64.0%と男性の40.0%よりも多く，また，腺がんにおける5年生存率は女性で45.0%と男性の29.1%を大きく上回っていた．他の組織型では性差は大きくなかった．Table 3において，進行度ごとの組織型分布を性別にみても，どの進行度においても女性における腺がんの占める割合は男性よりも大きく，特に限局患者において顕著であった．

他国との比較

ICBPの結果より，日本の肺がん患者の生存率を他国の肺がん患者の生存率と比較した．日本の結果はJ-CANSISデータより2002～2006年診断の症例を使用し，ICBPの結果は2004～2007年診断症例となっている．ICBPの結果は非小細胞がんと小細胞がんに分け，1年相対生存率で示されていたので，それに準じてJ-CANSISのデータを分析した．国別の組織型分布では，日本の肺がん患者に占める腺がんの割合は47.1%で，次いでスウェーデンは44.8%と他国より多かった．また，日本の肺がん患者に占める小細胞がんの割合は11.1%と他国よりも若干少なかった（Figure 1）．

生存率については，日本のみ性別に示した．非小細胞肺がんの1年相対生存率は日本女性で64.6%と他国よりもかなり高い値であった．ICBP参加国の中ではスウェーデンが46.0%と最も高かった（Figure 2）．進行度分布では，日本の遠隔転移患者の占める割合は最も低く，40.1%であった．限局患者の割合が最も高かったオーストラリアは進行度の定義の違いによるものであり，それを除けば，日本の限局患者の割合が25.2%と最も高かった（Figure 3）．進行度別の1年相対生存率では，いずれの進行度においても日本人の非小細胞肺がん患者が高く，特に限局や遠隔転移で顕著であった（Figure 4）．

小細胞肺がんにおいても日本人の1年相対生存率は他国より高かったが，非小細胞肺がんでみられたほどの差はなかった（Figure 5）．進行度分布では，定義の異なるオーストラリアを除けば，限局患者の割合が最も高かったのは英国で8.4%，次いで日本が7.7%であった．遠隔転移患者の割合は日本が57.1%と最も低く，英国は80.7%と最も高かった（Figure 6）．進行度別の小細胞肺がんの1年相対生存率では，限局においては日本人男性が80.9%と最も高く，次いでスウェーデンが72.4%であり，英国が43.6%と最も低かった．領域患者では日本人男性が最も高く，日本人女性はスウェーデン，デンマークと近い値であった．遠隔転移患者においては，日本人女性の1年生存率が最も高く，英国が最も低かった（Figure 7）．

考　察

日本の肺がん生存率

日本の肺がん患者の生存率では，女性が高く男性が低いという性差が観測された．また，年次推移においても女性における生存率の向上が顕著であった．これは男女における組織型分布の違い，主に腺がんの占める割合の違い（女性で多く，男性で少ない）が影響していると考える．特に，非喫煙者の多い女性においては，CT検査の普及により，CTでみつかりやすいlepidic patternの腺がんが多く診断されているためではないかと考えられる．また，女性に多いEGFR遺伝子変異陽性腺がんに有効とされる分子標的薬であるEGFRチロシンキナーゼ

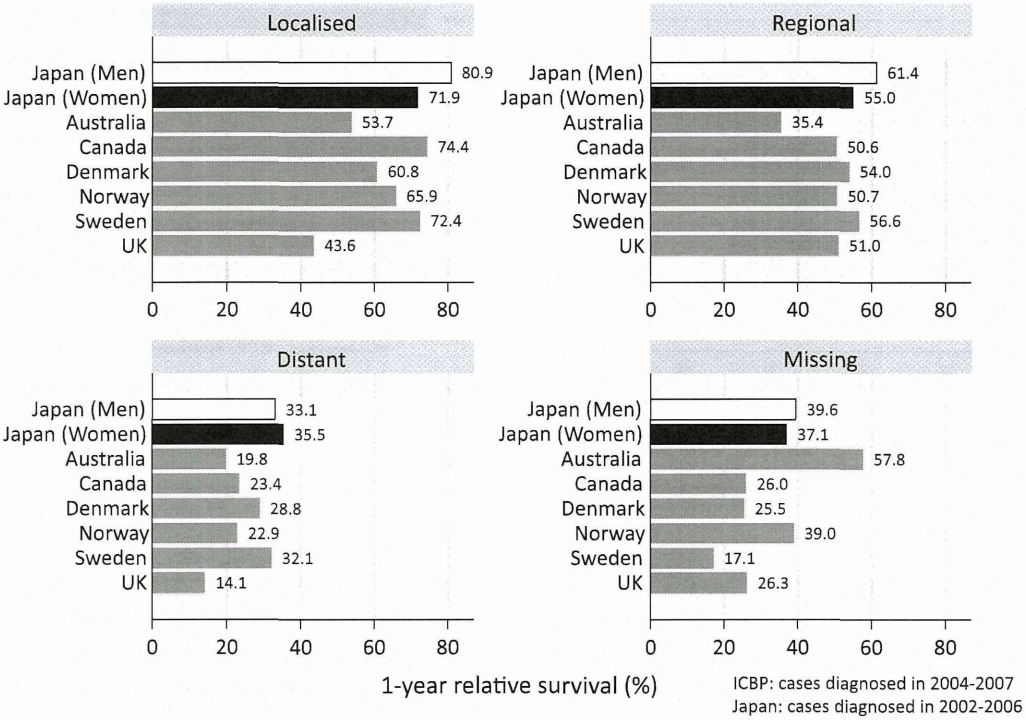

Figure 7. One-year relative survival of small-cell lung cancer: by stage.

阻害剤が2002年以降に臨床導入されたことが影響している可能性もある．今後臨床情報と合わせてさらなる検討が必要である．

なぜ日本は他国と比べて高いのか？

進行度分布および腺がんの占める割合の違いが理由として考えられる．非小細胞がん，小細胞がんのいずれにおいても，日本の肺がん患者の進行度分布は他国と比べ，遠隔転移例の占める割合が低い，または限局患者の占める割合が高かった．限局割合が高い理由としては，日本においては他国では実施されていない胸部X線による肺がん検診が実施されている影響も考えられる．またそれだけでなく，他国と比べ日本では，診療の現場でCTを撮影する機会が多いことも影響しているといえよう．また，日本では上述のようにCTにより微小な腺がんがみつかりやすいため，全体的に予後のよい腺がんの占める割合が高いことも，日本における非小細胞肺がんの生存率が他国より高い一因といえる．CTの普及に関連し，進行度分布の違いや，進行度別の生存率に影響を与えるstage migration (Will Rogers現象[7]) が起こっている可能性もある．たとえば，CTが普及していない国では領域浸潤として診断される患者も日本においてはCTでstagingすることにより，遠隔転移と診断されるため，進行度別に生存率をみると日本の生存率の方が高くなるという現象である．

今回のデータからは分析が困難であったが，治療内容の違いや，喫煙率の違い，がん登録の予後調査の完全性の違いなど，様々な要因が影響を与えていると考えられる．さらに詳細なデータに基づき，国際間の生存率格差の要因を検討する必要がある．

本論文内容に関連する著者の利益相反：なし

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