Original Article

The Prevalence of Adenocarcinoma in Non-small Cell Lung Cancer Patients at Chulabhorn Hospital

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Objective: To study the prevalence of the adenocarcinoma cell type in non-small cell lung cancer cases at Chulabhorn Hospital and examine the correlation between histology type and survival of patients.

Materials and Methods: We examined the medical records of non-small cell lung cancer cases treated in Chulabhorn Hospital from January 2009 to December 2011. Baseline demographic data and cancer treatment information were obtained for survival analyses.

Results: Among 62 cases of non-small cell lung cancer, 67.7% were the adenocarcinoma subtype. The median survival of non-small cell lung cancer cases was 11 months (95% CI; 9.0 to 18.0), 12 months in adenocarcinoma group and 7.4 months in squamous cell carcinoma group. There was statistically significant differences of survival among different histology(p=0.006). There was a slightly higher incidence of adenocarcinoma in the non-smoker group compared with the smoker group, 67.7% vs. 64.7%, respectively. Smoking status was significantly associated with histology subtype (p=0.034).

Conclusion: The adenocarcinoma subtype was found in approximately two-thirds of non-small cell lung cancer cases at Chulabhorn hospital. The median survival of patients with the adenocarcinoma subtype was longer than patients with the squamous cell carcinoma subtype with statistically significant.

Keywords: Adenocarcinoma of lung, Non small cell lung cancer

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In Thailand, lung cancer is the second most common cancer in males and the fourth in females[1]. Lung cancer is classified into small cell and non-small cell carcinomas. Among the non-small cell carcinomas, there are two histology types, squamous cell carcinoma (epidermoid) and non-squamous cell carcinoma, the latter of which includes adenocarcinoma, large cell carcinoma and not otherwise specified subtype[2]. Adenocarcinoma is the most common histology among non-smokers diagnosed with lung cancer.

Currently, Previous reports showed that pemetrexed has efficacy in the non-squamous cell carcinoma subgroup[3,4]. Another study showed that the reduced response of patients with squamous cell carcinoma of lung to Pemetrexed is because of the higher level of thymidylate synthase[5]. Therefore it is critical to define the histology subtype to determine the appropriate treatment.

The prevalence of adenocarcinoma in Thailand varies according to the study groups. For example, previous studies reported prevalence rates of 52.1% at the Songkhlanagarind hospital[6], 39% at the Chest Disease Institute[7] and 29% at the Siriraj Hospital[8].

In the present study, the objective was to determine the prevalence of pulmonary adenocarcinoma in Chulabhorn Hospital during the first 2 year of this hospital opening and examine the association between the histology subtypes and survival, as well as the correlation between cigarette smoking and histology subtypes of lung cancer.

Materials and Methods

The present study was a retrospective review of medical records of 244 non-small cell lung cancer patients treated in Chulabhorn Hospital from January 2009 to December 2011. The eligible criteria included a complete pathology report at Chulabhorn Hospital and patients who were treated with at least one of the treatment modalities at this hospital. The exclusion criteria were cytological diagnosis

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of non-small cell lung cancer and patients who did not have cancer tissue reviewed in the hospital.

Patient characteristics, including sex, age, smoking history, presenting symptoms, histology type, staging at diagnosis and type of treatment, were collected. We calculated survival time from the date of diagnosis to the date of death. The protocol of this research was reviewed and approved by the Human research ethics committee Chulabhorn Research Institute No. 003/2555.

Statistical analysis

Descriptive statistics (frequency, percentage, mean, median and standard deviation) were used for demographic and clinical characteristics. Survival was estimated by Kaplan-Meier method. The overall survival between histology subtypes was compared by log rank test. A p-value less than 0.05 was considered statistically significant.

Results

A total of 244 lung cancer patients were treated at Chulabhorn Hospital during 2009 to 2011. Among the 244 patients, 62 patients were non-small cell lung cancer cases with samples of tissue biopsy reviewed at Chulabhorn Hospital and received at least one modality of treatment in Chulabhorn Hospital.

Among the 62 cases, 35 (57.4%) were males, 45 (75.0%) had no past medical illness and 31 (60.8%) had never smoked (Table 1). Approximately one-third of patients (33.9%) presented with cough. Bronchoscopy was performed in 26 patients (42.6%) for tissue biopsy. Forty-eight patients (78.7%) were stage IV at diagnosis (Table 1).

Regarding the histology type, adenocarcinoma was found in 42 cases (67.7%); the remaining cases included 6 cases (9.8%) of squamous cell carcinomas, 11 cases (18.1%) of non-small cell carcinomas, 2 cases (3.3%) of large cell carcinomas, 1 case (1.6%) of adenosquamous cell carcinoma and 2 cases (3.3%) of other mucinous neoplasm (Table 2).

The incidence of death among the 62 patients was 4.7: 100 patients/month (95% CI: 3.6 to 6.0). We compared the median survival of non-small cell lung cancer patients according to staging at diagnosis. Data for stage I patients could not be calculated because there was only one patient and the patient died. For stage II and III patients, the median survival was 33.9 months (16.2 to not available) and 29.6 months (3.08 to not available), respectively. The median survival for stage IV patients was 10.2 months (95% CI: 6.8 to 12.2). There were statistically significant differences in survival rates in the four stage groups (p=0.04) (Figure 1).

The median survival of non-small cell lung cancer was 11.0 months (95% CI: 8.95 to 18.03) The median survival of the adenocarcinoma subtype was 12 months (95% CI: 10.1 to 25.7 months), while the squamous cell carcinoma subtype and large cell carcinoma subtype had a median survival of 7.41 months (95% CI: 3.08 to not available) and 8.95 months (95% CI: 8.95 to not available), respectively. The median survival estimate of the adenosquamous cell carcinoma subtype could not be calculated. Non-small cell carcinoma had a median survival estimate of 9.74 months (95% CI: 1.6 to 33.9), whereas the median survival estimate of other histology types was 5.28 months (95% CI 5.28 to not available). There was a significant correlation of the six histology types and survival estimate (p=0.006) (Figure 2).

We next examined the relationship between smoking status and histology subtypes. There was a slightly higher prevalence of the adenocarcinoma subtype in the non-smoker group than the smoker group (67.7% vs. 64.7%, respectively). Additionally, 23.5% of smokers and 2.9% of

Table 1. Patients' demographic data

Demographic data	Number (%)
Sex	
Male	35 (57.4)
Female	26 (42.6)
Nationality	
Thai	59 (96.7)
Non-Thai	2 (3.3)
Underlying diseases	
None	45 (75)
Diabetes mellitus	4 (6.7)
Hypertension	5 (8.3)
Dyslipidemia	2 (3.3)
Chronic obstructive pulmonary disease	1 (1.7)
Pulmonary tuberculosis	1 (1.7)
Other	9 (15)
History of smoking	
Never smoker	31 (60.8)
Ex-smoker	14 (27.5)
Current smoker	6 (11.8)
Unknown	10 (16.4)
Presenting symptoms asymptomatic	6 (10.2)
Cough	20 (33.9)
Dyspnea	5 (8.5)
Hemoptysis	6 (10.2)
Metastasis site symptoms	19 (32.3)
Tissue diagnosis	
Bronchoscopy	26 (42.6)
Transthoracic needle biopsy of lung mass	6 (9.8)
Surgical resection of lung mass	4 (6.6)
Tissue biopsy from other metastatic site	12 (19.7)
Tissue from lymph node biopsy	12 (19.7)
Stage of lung cancer at diagnosis	
I	1 (1.6)
II	3 (4.9)
III	9 (14.8)
IV	48 (78.7)

Table 2. Histology type and median survival time of non-small cell lung cancer patients

Histology type	n	Number of deaths (%)	Median survival time (months)
Adenocarcinoma	42	40 (95.2)	12, 95% CI (10.1 to 25.7)
Squamous cell carcinoma	6	6 (100)	7.4, 95% CI (3.08 to not available)
Large cell carcinoma	2	2 (100)	8.95, 95% CI (8.95 to not available)
Adenosquamous cell carcinoma	1	1 (100)	Not done
Non-small cell carcinoma	9	8 (88.9)	9.7, 95% CI (1.61 to 33.93)
Other	2	2 (100)	5.28, 95% CI (5.28 to not available)

Table 3. Correlation of cigarette smoking and lung cancer histology type

	n	Type			p-value
		Adenocarcinoma (n=34)	Squamous cell carcinoma (n=5)	Other (n=12)	
Non-smoker	34	23 (67.65%)	1 (2.94%)	10 (29.41%)	0.034
Smoker	17	11 (64.71%)	4 (23.53%)	2 (11.76%)	

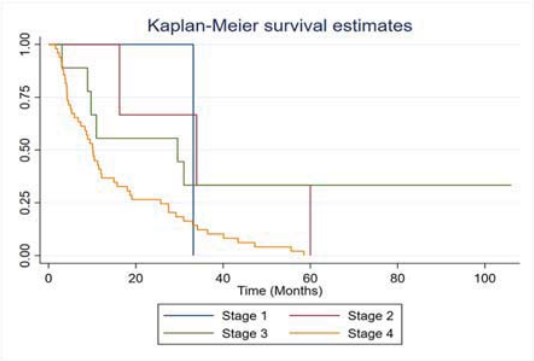

Figure 1. Kaplan-Meier graph of patient survival estimate according to stage (p=0.04).

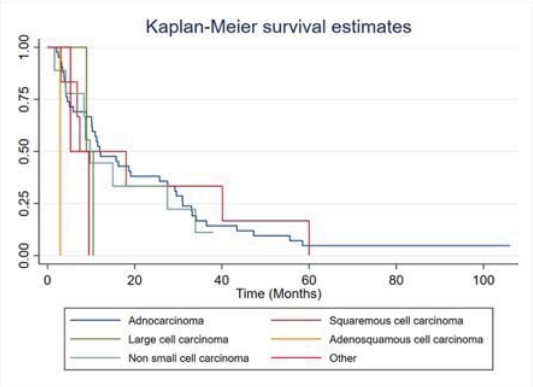

Figure 2. Correlation of lung cancer histology type and survival estimate (p=0.006).

non-smokers had squamous cell carcinoma. Smoking status was significantly associated with histology subtype (p=0.034) (Table 3).

Discussion

The prevalence of pulmonary adenocarcinoma among non-small cell lung cancer patients in Chulabhorn Hospital was 67.7% and more than 64% in both smokers and non-smokers. The current prevalence rate was higher than previous rates because of non-smokers in the Thai population. A similar result was reported with another study that revealed increased proportion of lung adenocarcinoma and a trend for decreased incidence of squamous cell carcinoma in Thailand[9].

The median survival estimate of patients with stage IV non-small cell lung cancer in Chulabhorn Hospital was 11 months, which was longer than historical data about 7 months[10]. Nearly all the Thai cancer patients have been treated with at least two standard systemic hemotherapy regimens (platinum-based chemotherapy and docetaxel) in National Health Care cancer programs since 2009.

The survival analysis of patients classified by histology types of non-small cell cancer showed that adenocarcinoma patients had a longer median survival than patients with squamous cell histology. This may be because patients with lung adenocarcinoma have further option of systemic chemotherapy, such as pemetrexed, that can extend the survival of patients.

Patients with lung adenocarcinoma also have the option for targeted therapy such as epidermal growth factor receptor-tyrosine kinase inhibitors (EGFR-TKIs) for EGFR mutation positive tumors. EGFR-TKIs can be used in one of any lines of systemic treatment for advanced non-small cell lung cancer. The survival rate of patients with advanced non-small cell lung with EGFR mutation positive tumors may be 2 years[11]. Another study of the survival of patient after treatment with EGFR-TKIs was conducted during the first 2 years of service at Chulabhorn Cancer Hospital in 2009 to 2011. During this time period, the price of EGFR-TKIs was very expensive and less than one-fourth of patients had access to these treatments.

Our results show that the prevalence of lung adenocarcinoma was higher than that of other subtypes. The survival of non-small cell lung cancer cases significantly differed according to histology.

What is already known on this topic?

The prevalence of pulmonary adenocarcinoma in Thailand varies at multiple institutions.

What this study adds?

The present study revealed the prevalence of pulmonary adenocarcinoma at Chulabhorn Hospital and clarified the correlation between histology subtype and survival data.

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Potential conflicts of interest

The authors declare no conflict of interest.

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