Lung Cancer in Hospitalized Patients of Thailand

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Objective: *To identify admission rates, treatments and healthcare cost of lung cancer.*
Material and Method: *Information on illness of inpatients and casualties came from hospitals nationwide and from hospital withdrawals from the 3 health insurance schemes in the fiscal year 2010. The data included 96% of the population and were analyzed by age groups, hospital levels, treatment and insurance schemes in patients with lung cancer.*
Results: *Lung cancer occurred in 27,896 of all admissions, contributing to admission rate of 60 per 100,000 persons. The admission rates were markedly increased in male more than 60 years old. The majority of treatments were palliative care 61.38%, chemotherapy 36.81%. The average length of stay and hospital charges in three insurance schemes groups: government welfare, social welfare and universal coverage were 40,571.29 Baht/9.86 days, 43,342.54 Baht/8.24 days and 17,897.75 Baht/6.08 days, respectively.*
Conclusion: *Admission rates showed that lung cancer increased with age. The highest rate was observed in more than 60 years old. The window gap in hospital charges and length of stay in three insurance schemes are interesting. Thus, analysis of treatment protocol should be examined.*

Keywords: *Lung neoplasm, Lung cancer, Lung cancer treatment, Cost of treatment*

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Lung cancer is the second and the fourth leading cancer in Thai male and female, respectively[1]. Treatment options of lung cancer, including chemotherapy, surgical intervention, radiotherapy and combinations, are determined by stage, cell type, comorbidities, patient's condition, socioecomic status and health insurance[2]. Additionally, these factors influence healthcare expense as well. Cost-effectiveness in therapeutic approaches is in the special concern due to worldwide economic crisis. The present study aims to describe epidemiology and healthcare cost of lung cancer in Thai population, particularly hospitalized patients.

Material and Method

Patient population

Data included inpatient Medical Expensing Forms for the fiscal year 2010 (October 1, 2009 to September 30, 2010) from the National Health Security Office (NHSO), Thailand and inpatient data from the Civil Servants Benefit System from the Comptroller General's Department and the Social Security Office.

Data received by the analyst team was checked for accuracy by looking for (a) overlapping information (b) visit dates (c) missing items (d) incorrect coding and (e) dating with the correct fiscal year.

Patients who were diagnosed with lung cancer (ICD-10 C34) and treatment (ICD-9-CM 32.3-32.6, 99.25, 92.21-92.22) were included in the present study.

Patient demographics and clinical characteristics

Baseline characteristics of lung cancer patients including age, genders, levels of hospital, regions of hospital, admission rates, treatment and hospital costs were captured from enrollment data.

Outcome measures

The present study outcomes were admission rates per 100,000 populations in age groups, regions, and hospital levels. Length of stay in days and

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healthcare costs in Thai Baht were compared between patients in three insurance groups; government welfare, social welfare and universal coverage.

Statistical analysis

The explanation of variables, tables of frequency enumeration and interrelationships were written using the SPSS program and checked before analyzing. After analyzing the data, the research team passed the primary analysis to ten medical specialists in order to check the validity of the information. Upon confirmation of validity, the data were compared to the Ministry of Public Health's Statistics Report 2010 for trend congruence as well as the hospital's mortality reporting for each age and disease group for comparison with the national Death Registration of the Registry Administration, Ministry of Interior Affairs.

Ethics approval was provided by Ethic Committee of the Faculty of Medicine, Khon Kaen University, under the guidelines of the Helsinki Declaration.

Results

Baseline characteristics and admission rates

Baseline characteristics of the study population are shown in Table 1. Lung cancer occurred in 27,896 of all admissions, contributing to admission rates of 60 per 100,000 adult persons. The admission rates increased with increasing age, especially in patients over 60 years old as shown in Fig. 1.

The majority of the patients that were admitted to hospital in the central region of the country, including Bangkok, are shown in Fig. 2.

The choices of treatment mainly were chemotherapy 36.81% and surgery 1.7% indicated advanced of the diseases and less early stage lung cancer for resection. The other treatments 61.38% were the representative of palliative care which was extract from the data based lung cancer that did not received either chemotherapy, surgery or radiotherapy as shown in Fig. 3.

Radiotherapy treatment was only 0.02% because most of radiotherapy do in outpatient setting or incomplete data from recording in ICD system in other diagnosis such as in other metastatic cancer.

Healthcare costs of lung cancer

The overall hospital charge of lung cancer

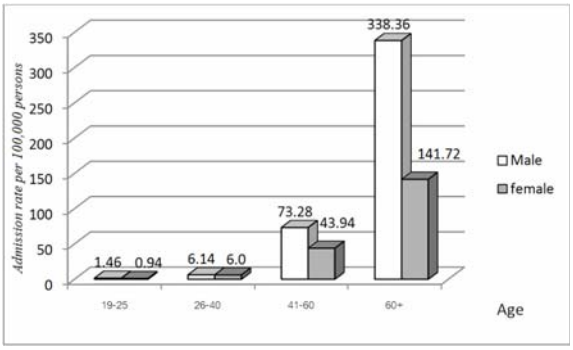


Fig. 1 Admission rate per 100,000 of lung cancer by age group

Table 1. Baseline characteristics of the study population

Characteristics	No. of admission (Total 27,896)	Admission rate (Total average 60)
Age (years)		
19-25	75	1.20
26-40	976	6.31
41-60	9,959	58.03
61 years and over	16,886	230.02
Male, No. (%)	17,711 (63.7)	79.20
Hospital level, No. (%)		
Primary	6,413 (22.99)	-
Secondary	4,597 (16.48)	-
Tertiary	15,055 (53.97)	-
Private	1,831 (6.56)	-
Region, No. (%)		
Northern	7,690 (27.57)	
Northeast	7,017 (25.15)	
Central	10,674 (38.26)	
Southern	2,515 (9.02)	

was 670,908,287 Baht. The average hospital charge per admission of persons with lung cancer was 24,050 Baht. The mean hospital charges in government welfare, social welfare, and universal coverage were 40,571, 43,343, 17,898 Baht, respectively. The mean length of stay in government welfare, social welfare and universal coverage were 9.86, 8.24, 6.08 days, respectively. Comparisons of the length of stay and the hospital charges among the three insurance groups are shown in Fig. 4, 5, respectively.

Discussion

The present study revealed informations about medical expense in hospitalized patients with lung cancer. The US national cost of cancer care is predicted to be at least 40% increase by the next decade[3]. If the authors use the same model of estimation, cost of lung cancer hospitalization in Thailand would exceed 1 billion Baht per year in 2020.

The authors found that the admission rate was highest in the elderly group due to higher incidence of lung cancer in this age cluster[1]. Moreover, elderly patients were more susceptible for cancer-related complications[4].

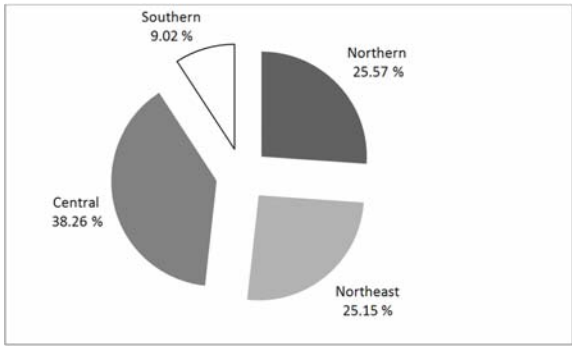


Fig. 2 Admission rate per 100 persons of lung cancer by region

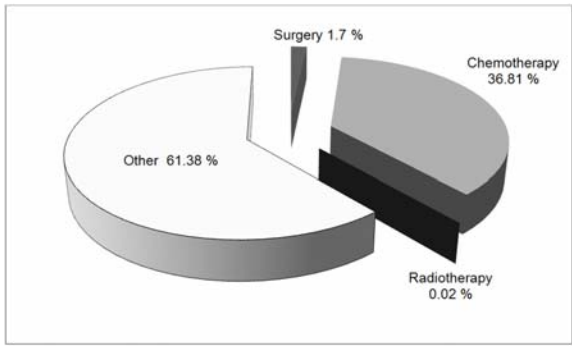


Fig. 3 Types of lung cancer treatments

Most patients with lung cancer were admitted in tertiary hospitals which reflected the complicated nature of the disease, leading to high expense. The major spending of hospitalized lung cancer patients was for other cost (approximately 60%), including diagnostic procedures, complication-related management, palliative treatment and supportive care. This finding was similar to other countries which specific treatment took account for only 40% of total expense[5]. Although this cost analysis did not include the expense of out-patient service, such as, initial work-up or long term follow-up; previous researches in Western countries indicated that total hospital costs represented approximately 60-80% of total expense[2,5,6].

Chemotherapy was the majority cost of specific treatment, while other countries reported diverse main definite management based on cell types of lung cancer[5,7]. The length of stay of chemotherapy session was shorter than the other treatments reflected

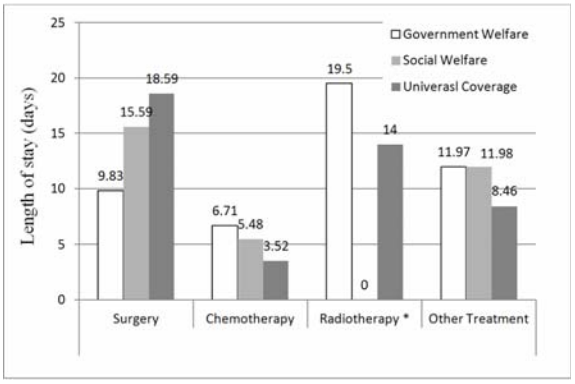
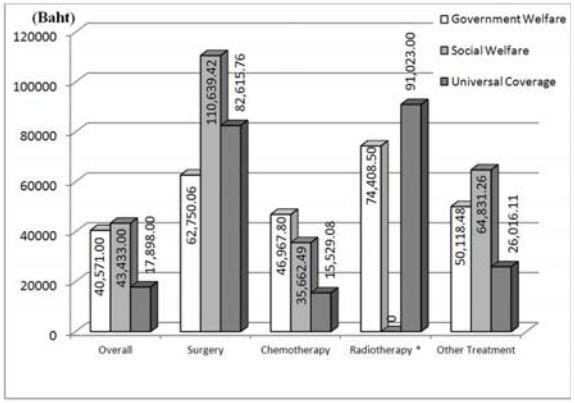


Fig. 4 Average length of stay and treatment among the three insurance groups



*None of hospitalized patient received radiotherapy in social welfare insurance group.

Fig. 5 Average hospital costs among the three insurance groups

that cost of chemotherapy session per day was the most expensive when compared with the other therapeutic options. However, it is the mainstay management for most patients.

Regarding health insurance, lung cancer patients with universal coverage seemed to spend less in chemotherapy, other treatment and overall expense than patients with government welfare or social welfare.

On the other hand, the cost of radiotherapy was higher in the group with universal coverage. More available options of chemotherapy, especially targeted therapy, in patients with government welfare and social welfare might partly explain this observation. However, further studies are needed to explore the differences in types of cancer, natural history, patients' belief and socioeconomic status which may affect prognosis, treatment outcomes and medical expenses.

Limitations

The present study indicates only hospitalized expense which is not a comprehensive cost of illness. Moreover, it does not aim to reveal the etiological factors, type or severity of the disease. Thus, we cannot conclude the association between expense and natural histories. Additional investigations are required to propose how to improve the cost-effectiveness of lung cancer management.

Conclusion

Lung cancer is one of the leading causes of hospitalization in Thai population which accompanied by high expense in management. Admission rates showed that lung cancer increased with age. The highest rate was observed in more than 60 years old. The specific treatment of lung cancer, mainly chemotherapy, spent only 40% of hospitalized cost. The window gap in hospital charges and length of stay in three insurance schemes are interesting.

Acknowledgement

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Potential conflicts of interest

None.

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การรักษาผู้ป่วยมะเร็งปอดในโรงพยาบาลของประเทศไทย

อนัฆพงษ์ พันธุ์มณี, โกสินทร์ วีระษร, ยุพา ถาวรพิทักษ์, เอื้อมแข สุขประเสริฐ, จาริญญ์ จินดาประเสริฐ

วัตถุประสงค์: *เพื่อศึกษาถึงอัตราการรับผู้ป่วยมะเร็งปอดเข้ารักษาในโรงพยาบาล แนวทางการรักษา และค่าใช้จ่ายของผู้ป่วยดังกล่าวในประเทศไทย*

วัสดุและวิธีการ: *รวบรวมข้อมูลความเจ็บป่วยของผู้ป่วยในจากฐานข้อมูลกลางของโรงพยาบาลในประเทศไทย แยกตามสิทธิการรักษาในปี พ.ศ. 2553 วิเคราะห์ผู้ป่วยที่ได้รับการวินิจฉัยมะเร็งปอดแยกตามอายุ ระดับสถานพยาบาลที่เข้ารับการรักษา แนวทางการรักษา ค่าใช้จ่ายตามสิทธิการรักษาพยาบาลต่างๆ ของประเทศไทย*

ผลการศึกษา: *พบผู้ป่วยมะเร็งปอดรับไว้รักษาเป็นผู้ป่วยใน 27,896 ครั้ง ซึ่งคิดเป็นอัตราการรับรักษาเป็นผู้ป่วยใน (admission rate) 60 ครั้งต่อประชากร 100,000 คน โดยผู้ป่วยชายที่มีอายุมากกว่า 60 ปี มีอัตราการรับไว้เป็นผู้ป่วยในสูงมากกว่าผู้ป่วยกลุ่มอายุอื่นๆ ผู้ป่วยที่รับไว้ดังกล่าวส่วนใหญ่ได้รับการรักษาด้วยวิธีประคับประคองตามอาการ (palliative care) ร้อยละ 61.38 เคมีบำบัดร้อยละ 36.81 ค่าใช้จ่ายและระยะเวลารักษาโดยเฉลี่ยแยกตามสิทธิการรักษาในกลุ่มสวัสดิการข้าราชการ ประกันสังคมและบัตรสุขภาพถ้วนหน้าคิดเป็น 40,571.29 บาท/9.86 วัน, 43,342.54 บาท/8.24 วัน และ 17,897 บาท/6.08 วัน ตามลำดับ*

สรุป: *อัตราการรับผู้ป่วยมะเร็งปอดไว้รักษาเป็นผู้ป่วยในเพิ่มขึ้นในผู้อายุมากกว่า 60 ปีและมีความแตกต่างกันของค่ารักษาพยาบาล ระยะเวลาการรักษาในโรงพยาบาลของแต่ละสิทธิการรักษา*