OVERALL SURVIVAL IN PATIENTS WITH STAGE IV NON-SMALL CELL LUNG CANCER

Author

- Chayawut Punsriwong
- Chayakamon Niyasom
- Pariphat Chompoonutprapa
- Sarut Pravitkulawath
  - 5th year medical student Naresuan University Hospital

Advisor

- Dr. Wittawat Jitpewngarm
  - Medical oncologist

INTRODUCTION

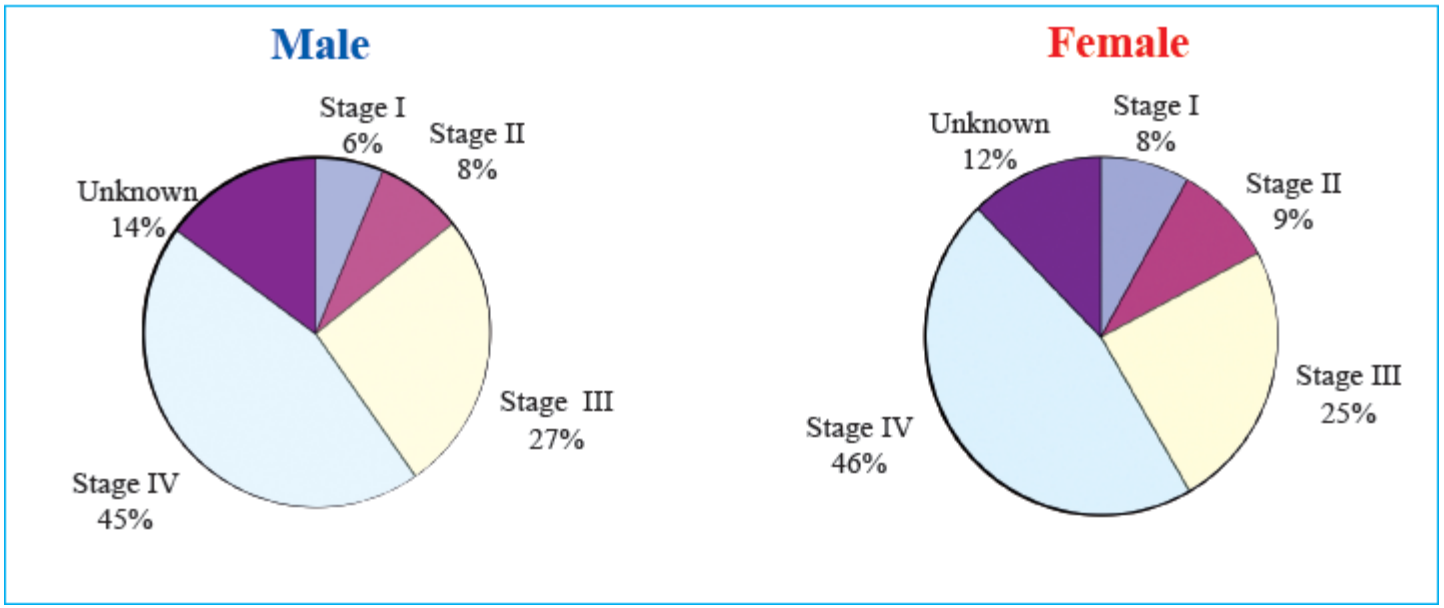
Background and Rationale

- Lung cancer is the leading cause of cancer death and appear to be most common cancer in the cancer patients[1]
- Generally, The overall 5-year survival rate is about 14 percent in all lung-cancer patients
- Lung cancer in Thailand is
  - the second most common cancer in males after liver cancer
  - the fourth in females after cervix, breast and liver cancers[2]

(1) Ferlay J, Shin HR, Bray F, Forman D, Mathers C and Parkin DM.
GLOBOCAN 2008 v2.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 10 [Internet].
Lyon, France: International Agency for Research on Cancer; 2010. Available from: http://globocan.iarc.fr, accessed on 19/11/2013.

(2) [2] Kamnerdsupaphon P, Srisukho S, Sumitsawan Y, Lorvidhaya V, Sukthomya V. Cancers in northern Thailand. Biomed Imaging Interv J. 2008 Jul;4(3):e46.

Background and Rationale



Number of new bronchus, lung cancer patient by stage and sex: 2009[1]

(1) National Cancer Institute. HOSPITAL - BASED CANCER REGISTRY 2010. Available from: www.nci.go.th/th/File.../hospital%20based%20cancer%20registry.pdf, accessed on 19/11/2013.

Background and Rationale

- **Risk factors**
  - Smoking, 80-90% [1], Head and Neck cancer, Working: nickel, chromium, asbestos, Genetic disease: Bloom syndrome, Li-Fraumeni syndrome, Hereditary retinoblastoma

- **Determining prognostic factors**
  - Staging, ECOG PERFORMANCE STATUS[2], Weight has been lost in six months or 5% in the last month, Female
  - Not associated with patient age[3]

(1) Alberg AJ, Brock MV, Samet JM. Epidemiology of lung cancer: looking to the future. J Clin Oncol. 2005 May 10;23(14):3175-85.
(2) Sorensen JB, Klee M, Palshof T, Hansen HH. Performance status assessment in cancer patients. An inter-observer variability study. Br J Cancer. 1993 Apr;67(4):773-5.
(3) Gerber DE, Rasco DW, Le P, Yan J, Dowell JE, Xie Y. Predictors and impact of second-line chemotherapy for advanced non-small cell lung cancer in the United States: real-world considerations for maintenance therapy. J Thorac Oncol. 2011 Feb;6(2):365-71.

REVIEW OF RELATED LITERATURES

Review of Related Literatures

- Lung cancer stage IV classified by AJCC 7th edition
  - M1a : Separate tumor nodule(s) in a contralateral lobe, tumor with pleural nodules or malignant pleural (or pericardial) effusion
  - M1b : Distant metastasis (in extrathoracic organs)(1)
- WHO classification
  - Small cell lung cancer (SCLC), 20%
  - Non-small cell lung cancer (NSCLC)
    - Adenocarcinoma: most common, 38%
    - Squamous cell carcinoma, 20%
    - Large cell carcinoma(2)

(1) Mirsadraee S, Oswal D, Alizadeh Y, Caulo A, van Beek E, Jr. The 7th lung cancer TNM classification and staging system: Review of the changes and implications. World J Radiol. 2012 Apr 28;4(4):128-34.

(2) Johnson DH BW, Carbone DP, et al Cancer of the lung: non-small cell lung cancer and small cell lung cancer. In: Abeloff MD AJ, Niederhuber JE, Kastan MB, McKena WG editor. Clinical Oncology. Philadelphia, Pa: Churchill Livingstone Elsevier; 2008.

The AJCC Cancer Staging Manual 7th Editions: TNM Staging

Primary Tumor (T)	
TX	Primary tumor cannot be assessed, or tumor proven by the presence of malignant cells in sputum or bronchial washings but not visualized by imaging or bronchoscopy
T0	No evidence of primary tumor
Tis	Carcinoma in situ
T1	Tumor 3 cm or less in greatest dimension, surrounded by lung or visceral pleura, without bronchoscopic evidence of invasion more proximal than the lobar bronchus subdivided into: *T1a: ≤ 2 cm* *T1b: > 2 cm but ≤ 3 cm*
T2	*T2a: > 3 cm but ≤ 5 cm* *T2b: > 5 cm but ≤ 7 cm* Or tumors ≤ 7 cm with invasion of visceral pleura, atelectasis of less than entire lung, proximal extent at least 2 cm from carina
T3	Tumors > 7 cm or with: Direct invasion of chest wall, diaphragm, phrenic nerve, mediastinal pleura, parietal pericardium, main bronchus < 2 cm from carina (without involvement of carina) *Tumor nodules in the same lobe as the primary tumor*
T4	Tumor of any size with: Invasion of mediastinum, heart, great vessels, trachea, esophagus *Metastatic tumor nodules in different lobe from the primary tumor*

The AJCC Cancer Staging Manual 7th Editions: TNM Staging

Regional Lymph Nodes (N)	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastases
N1	Metastasis in ipsilateral peribronchial and/or ipsilateral hilar lymph nodes and intrapulmonary nodes, including involvement by direct extension
N2	Metastasis in ipsilateral mediastinal and/or subcarinal lymph node(s)
N3	Metastasis in contralateral mediastinal, contralateral hilar, ipsilateral or contralateral scalene, or supraclavicular lymph node(s)
Distant Metastasis (M)	
M0	No distant metastasis
M1	Distant metastasis subdivided into: ***M1a:*** Separate tumor nodule(s) in a contralateral lobe, tumor with pleural nodules or malignant pleural (or pericardial) effusion ***M1b:*** Distant metastasis (in extrathoracic organs)

The AJCC Cancer Staging Manual 7th Editions: Anatomical Staging

Occult Carcinoma	TX	N0	M0
Stage 0	Tis	N0	M0
Stage IA	T1a	N0	M0
	T1b	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T2b	N0	M0
	T1a	N1	M0
	T1b	N1	M0
	T2a	N1	M0
Stage IIB	T2b	N1	M0
	T3	N0	M0

The AJCC Cancer Staging Manual 7th Editions: Anatomic Staging

Stage IIIA	T1a	N2	M0
	T1b	N2	M0
	T2a	N2	M0
	T2b	N2	M0
	T3	N1	M0
	T3	N2	M0
	T4	N0	M0
	T4	N1	M0
Stage IIIB	T1a	N3	M0
	T1b	N3	M0
	T2a	N3	M0
	T2b	N3	M0
	T3	N3	M0
	T4	N2	M0
	T4	N3	M0
Stage IV	Any T	Any N	M1a
	Any T	Any N	M1b

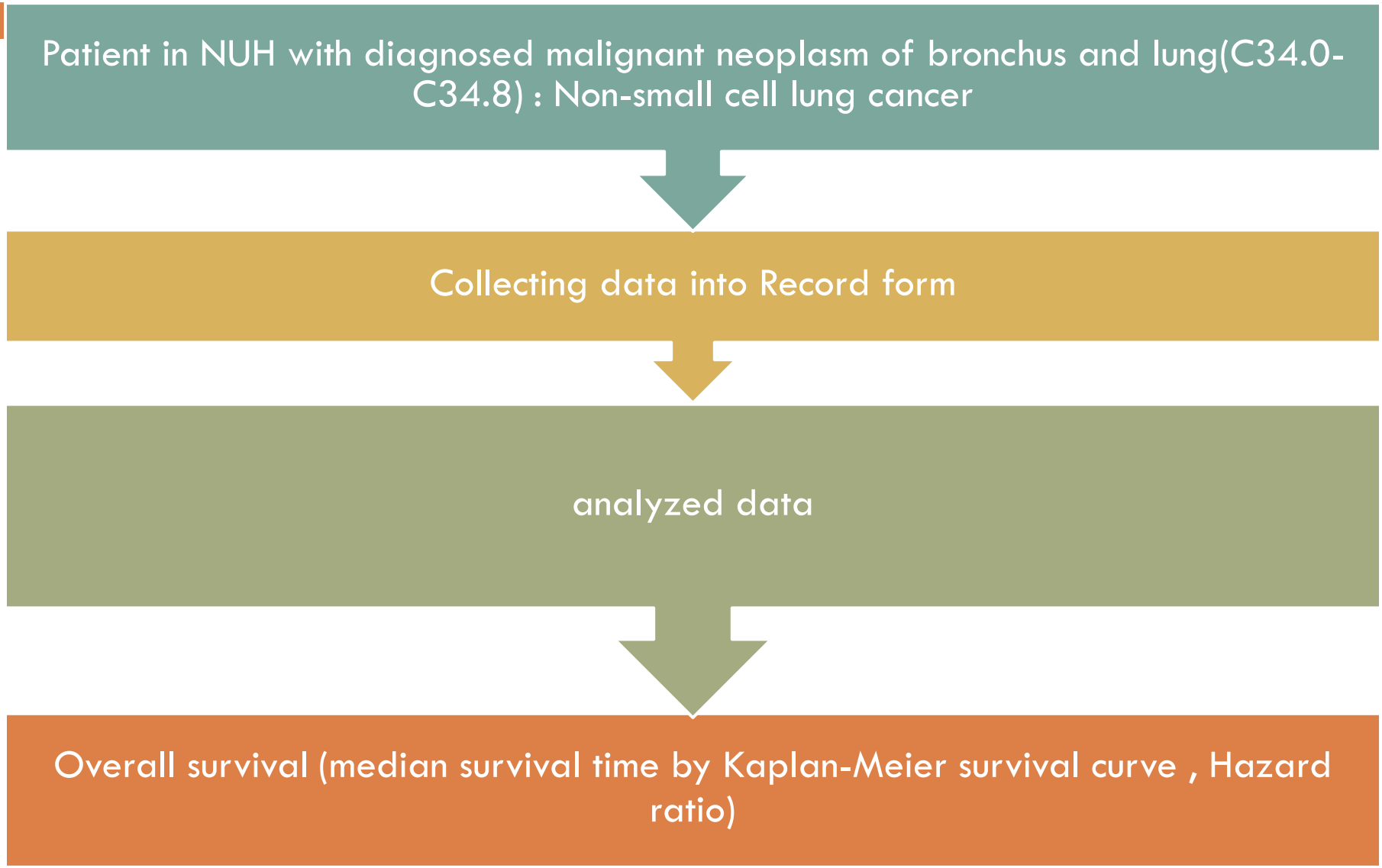
Review of Related Literatures

- **First-line treatment**
  - Platinum-based antineoplastic drugs : Cisplatin, Carboplatin
  - Other antineoplastic drugs : Etoposide, Gemcitabine, Paclitaxel

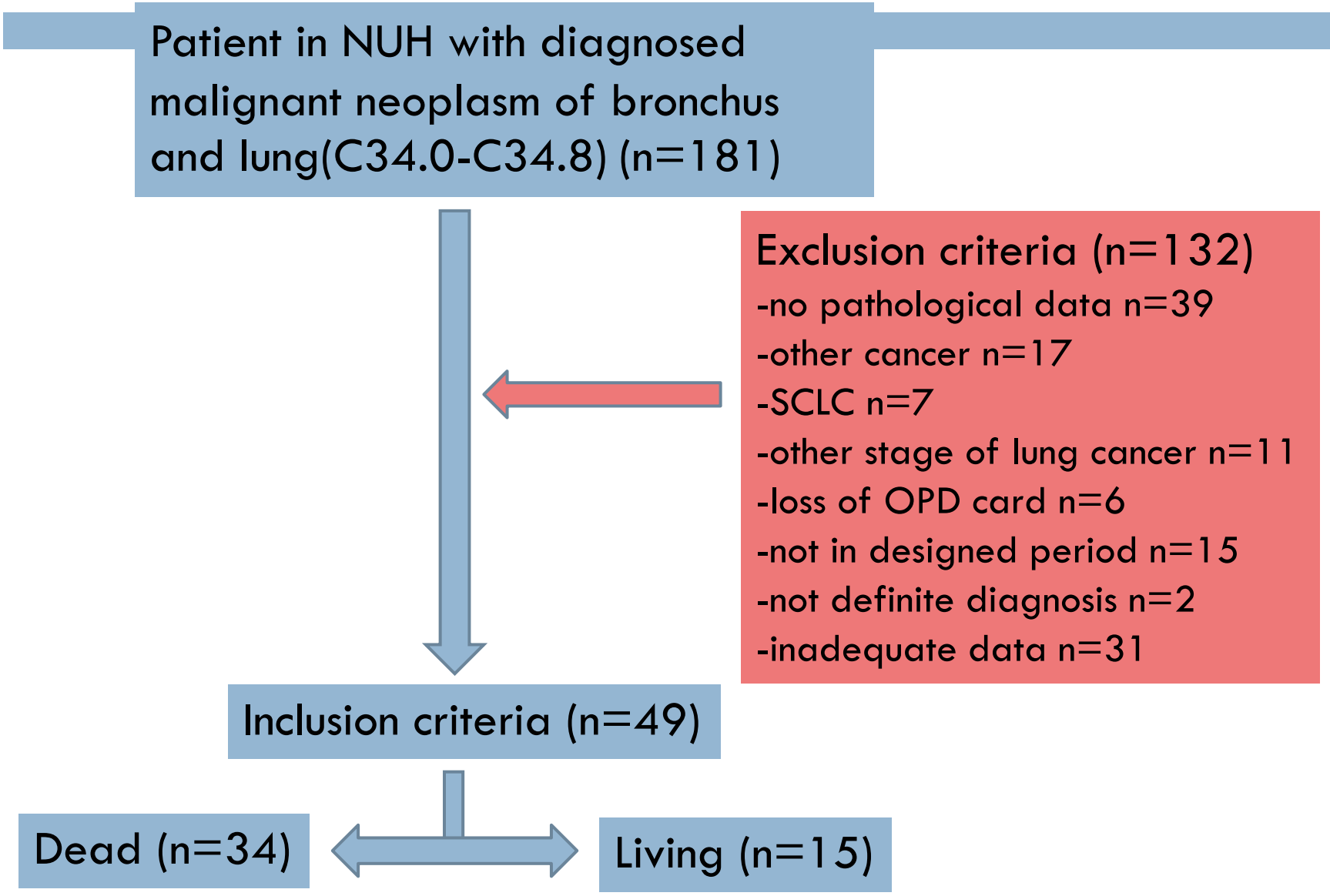
RESEARCH METHODOLOGY

Methodology

- This research is a retrospective analytical study based on medical records of the lung cancer patients in Naresuan University Hospital from 1st January 2010 to 31st March 2013
- The data was statistically analyzed by using percentage, standard deviation, Kaplan-Meier survival curve, and hazard ratio


Patient in NUH with diagnosed malignant neoplasm of bronchus and lung(C34.0-C34.8) : Non-small cell lung cancer
Collecting data into Record form
analyzed data
Overall survival (median survival time by Kaplan-Meier survival curve , Hazard ratio)

Flow diagram

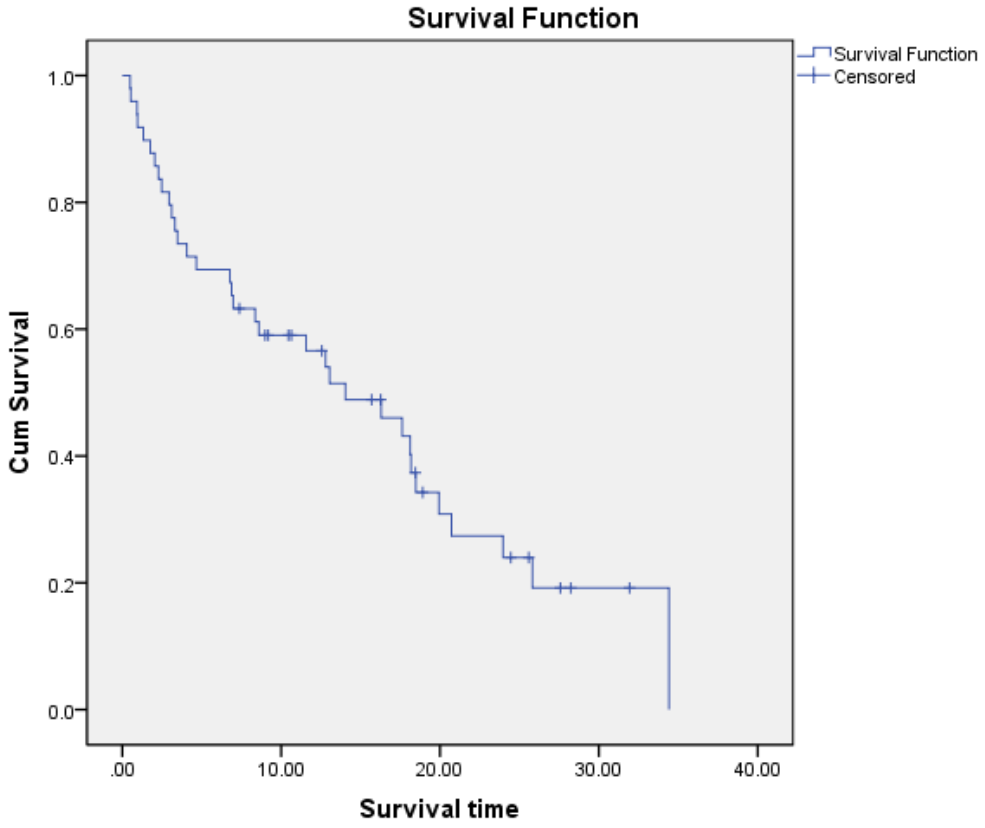


RESULT

Result

- The median survival time of the 49 participants was 14.05 months.The result of the study showed that the significant factors affecting the overall survival are female($p = 0.008$), having no brain or pleura metastasis($p = 0.025$), and being treated with chemotherapy ($p < 0.001$)

Survival



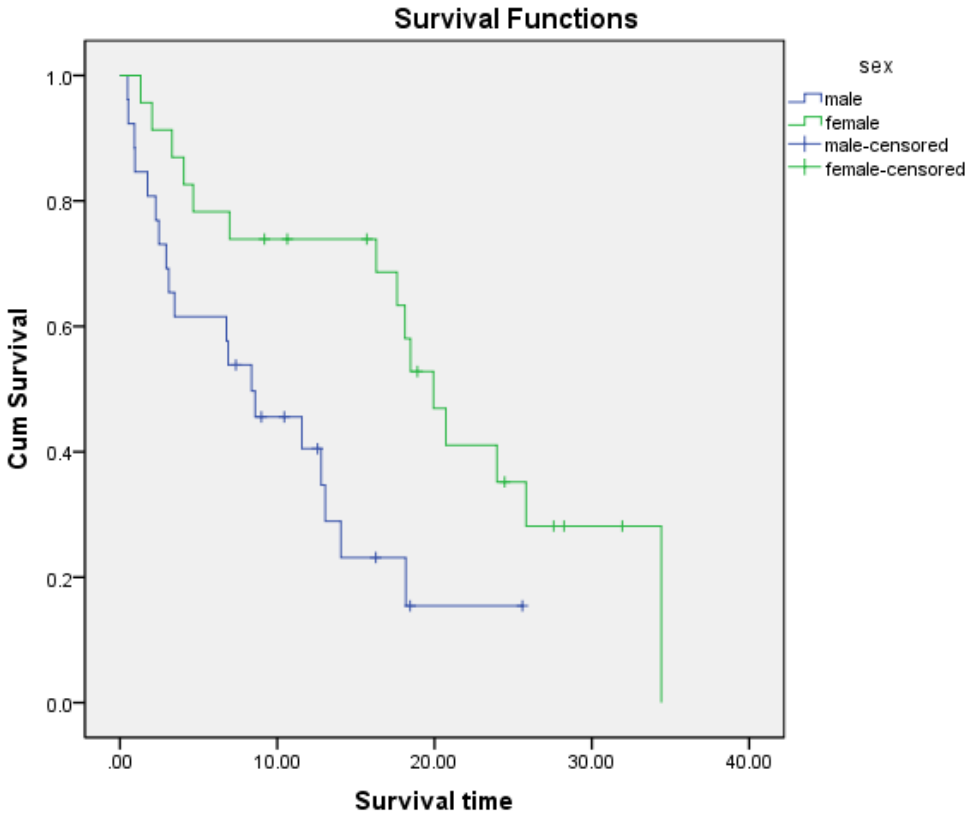
Graph was shown the survival of all research participants

Survival

Sex	Median survival time (month)	SD (month)	95% CI (month)
Male	8.4	2.75	2.97 – 13.75
Female	19.9	1.73	16.54 – 23.33

Sex	Hazard Ratio	SD (month)	95% CI (month)	P-value
Male	2.75	1.06	1.29 – 5.85	0.008
Female				

Survival



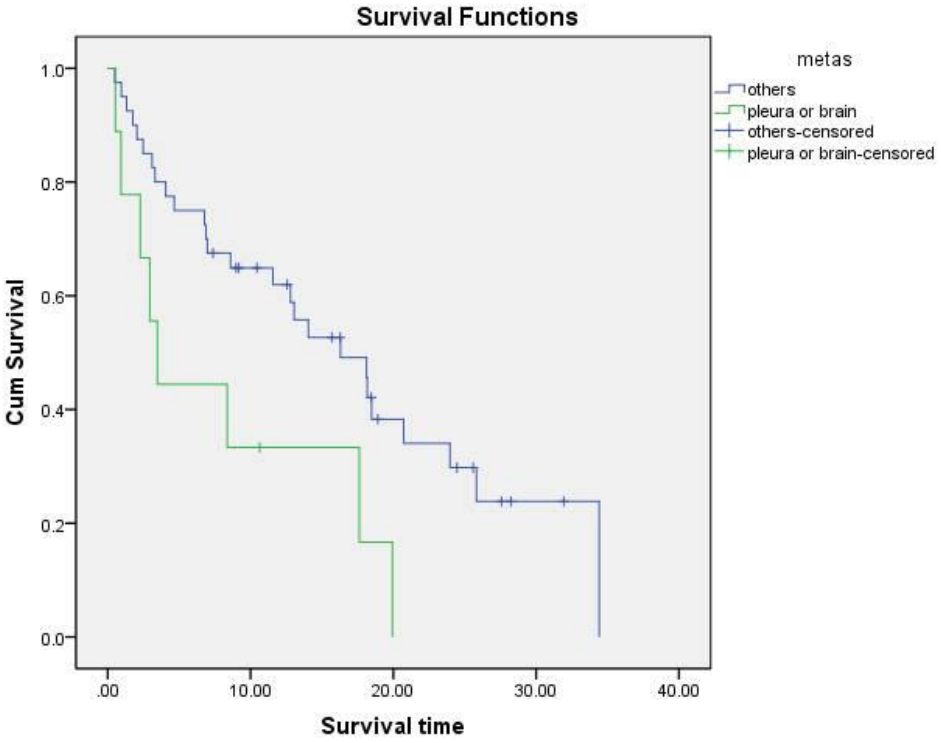
Graph was shown the survival of all research participants by gender

Survival

Metastasis	Median survival time (month)	SD (month)	95% CI month)
Metastasis to the brain or pleural	3.47	0.79	0.53 – 17.62
No metastasis to the brain or pleural	16.3	3.16	8.6 – 23.97

Metastasis	Hazard Ratio	SD (month)	95% CI (month)	P-value
Metastasis to the brain or pleural	2.55	1.06	1.13 – 5.76	0.025
No metastasis to the brain or pleural				

Survival



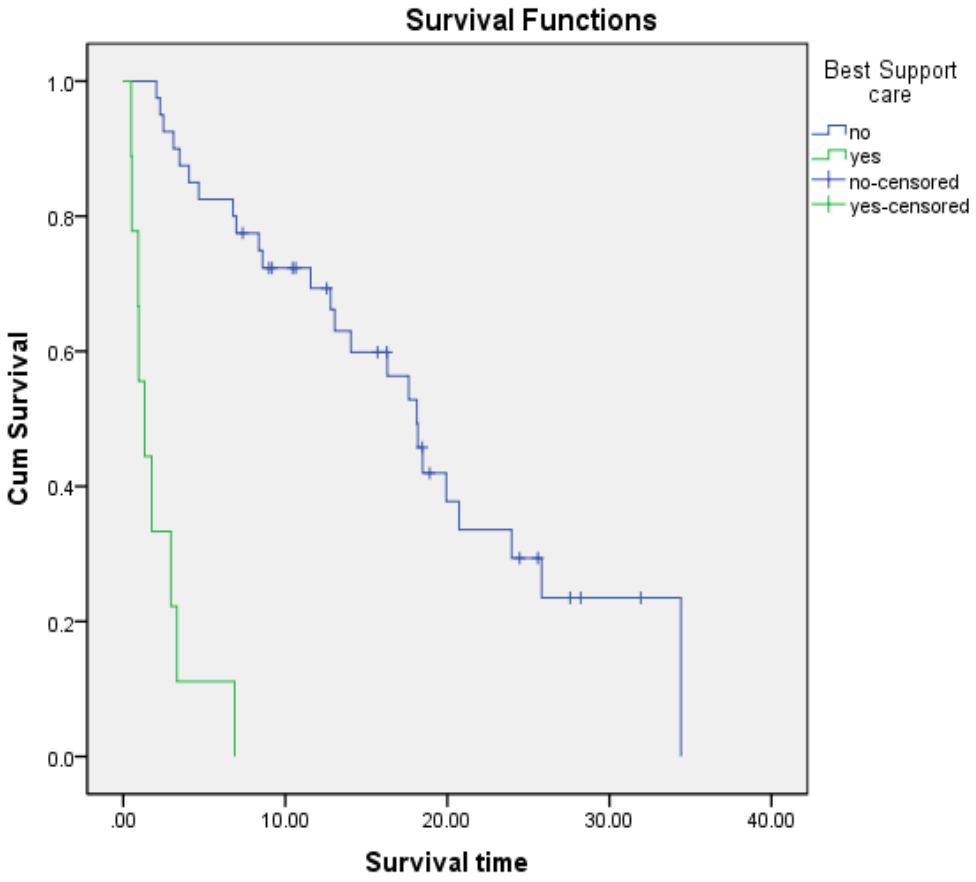
Graph was shown the survival of all research participants by metastasis

Survival

Treatment	Median survival time (month)	SD (month)	95% CI (month)
Best supportive care	1.32	0.54	0.5 -3.31
chemotherapy	18.12	1.32	15.53 – 20.71

Treatment	Hazard Ratio	SD (month)	95% CI (month)	P-value
Best supportive care	15.89	8.17	5.81 – 43.52	< 0.001
chemotherapy				

Survival



Graph was shown the survival of all research participants by treatment

CONCLUSION

Conclusion

- The significant factors affecting the overall survival in patients with stage IV non-small cell lung cancer are female, having no brain or pleura metastasis, and being treated with chemotherapy.
- This research can be used to compare overall survival between Naresuan University Hospital and other hospitals in order to develop an effective treatment for stage IV non-small cell lung cancer.