

Prevalence and factors associated with brain metastases in advanced non-small-cell lung cancer (NSCLC) at Phramongkutklao Hospital

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Background: Brain metastases (BM) remain a significant problem in NSCLC patients. Advanced NSCLC patients who develop BM either at the time of diagnosis or later during the course of disease seem to have shorter survival. The reports of factors associated with brain metastases are varied in previous studies including age, histology subtypes and oncogenic driver alterations.

Objective: To determine the prevalence and factors that associated with brain metastases in advanced NSCLC patients. And to analyze the median overall survival (OS) of the patients who had brain metastases at the time of diagnosed NSCLC and during the course of disease.

Methods: Medical records of 552 patients who were diagnosed advanced NSCLC between 2011 and 2018 were reviewed. The data of patient characteristics such as age, gender, ECOG performance status, tumor size, mediastinal node involvement, histology subtypes, EGFR and ALK testing and treatment modalities were recorded. The prevalence of brain metastases was calculated by descriptive statistics. Factors associated with brain metastases were analyzed by using univariate and multivariate logistic regression analyses. Kaplan–Meier methods were used to analyze the median OS of NSCLC patients with brain metastases.

Results: Between January 2011 and December 2018, of 552 patients newly diagnosed with advanced NSCLC, there were 164 patients who had brain metastases. The prevalence of brain metastases was 29.7%. There were 11.1% of patients (61/552) who had brain metastases at the time of advanced NSCLC diagnosis and 18.6% (103/552) who had brain metastases during the course of disease. In multivariate analysis, younger age and adenocarcinoma subtype were significantly associated with the presence of brain metastases, odd ratio = 1.547, 95%CI 1.049-2.280, $p = 0.028$) for age < 65 years and odd ratio = 2.529, 95%CI 1.262-5.067, $p = 0.009$) for adenocarcinoma subtype. The median OS of patients who had brain metastases at time of advanced NSCLC diagnosis was 7.5 months (95% CI; 6.4-8.5) and the median OS of patients who had brain metastases during the course of disease was 14.4 months (95% CI; 12.2 - 16.5).

Conclusions: One-third of advanced NSCLC patients developed brain metastases. Younger age and adenocarcinoma subtype were factors associated brain metastases. Patients who had brain metastases during the course of diseases had better survival outcomes compared to those who had brain metastases at the time of advanced NSCLC diagnosis. These might be due to good ECOG PS and the possibility to receive systemic therapy.