

ABSTRACT

Background: Lung cancer is the leading cause of cancer-related deaths worldwide, with non-small cell lung carcinoma (NSCLC) accounting for approximately 85% of all cases. Mutations in the Epidermal Growth Factor Receptor (EGFR), particularly exon 21 L858R and exon 19 deletions, play a crucial role in guiding the use of targeted therapies such as Tyrosine Kinase Inhibitors (TKIs). However, limited availability of tumor tissue samples often hampers the assessment of EGFR mutation status. MicroRNAs (miRNAs), especially miR-361b-5p, have emerged as potential non-invasive molecular biomarkers for EGFR mutation prediction based on previous studies.

Objective: To determine the relationship between miR-361b-5p expression and EGFR mutation status in patients with lung adenocarcinoma.

Methods: This cross-sectional study used cytological samples of lung adenocarcinoma with known EGFR mutation status. miR-361b-5p expression was assessed using Reverse Transcription Polymerase Chain Reaction (RT-PCR), and relative gene expression was quantified using the fold change method. Statistical analysis to examine the association between miR-361b-5p expression and EGFR mutation status was performed using One-Way ANOVA.

Results: A significant difference in miR-361b-5p expression was found between EGFR-mutant and wild-type groups ($p < 0.05$). The highest expression was observed in patients with the exon 21 L858R mutation.

Conclusion: There is a significant association between elevated miR-361b-5p expression and the presence of EGFR mutations, particularly exon 21 L858R. These findings support the potential of miR-361b-5p as a non-invasive biomarker for predicting EGFR mutation status in lung adenocarcinoma patients.

Keywords: NSCLC, adenocarcinoma, miR-361b-5p, EGFR, L858R

INTISARI

Latar belakang: Kanker paru merupakan penyebab utama kematian akibat kanker di dunia, dengan kanker paru karsinoma bukan sel kecil (KPKBSK) mendominasi 85% kasus. Mutasi *Epidermal Growth Factor Receptor* (EGFR), khususnya mutasi L858R di ekson 21 dan delesi ekson 19, berperan penting dalam menentukan pemilihan terapi target berupa Tyrosine Kinase Inhibitor (TKI). Namun, keterbatasan sampel jaringan tumor seringkali menjadi hambatan dalam pemeriksaan status mutasi EGFR. MikroRNA (miRNA), khususnya miR-361b-5p, berpotensi menjadi biomarker molekuler non-invasif yang dapat menggambarkan status mutasi EGFR berdasarkan penelitian terdahulu.

Tujuan: Mengetahui hubungan antara ekspresi miR-361b-5p dengan status mutasi EGFR pada pasien adenokarsinoma paru.

Metode: Penelitian ini menggunakan desain potong lintang dengan sampel sitologi adenokarsinoma paru yang telah diketahui status mutasi EGFR-nya. Penilaian ekspresi miR-361b-5p menggunakan metode pemeriksaan Reverse Transcription Polymerase Chain Reaction (RT-PCR), kemudian kuantifikasi relatif ekspresi gen dihitung berdasarkan metode *fold change*. Analisis statistik untuk mengetahui hubungan antara miR-361b-5p dengan status mutasi EGFR menggunakan One Way Anova.

Hasil: Terdapat perbedaan ekspresi miR-361b-5p yang signifikan antara kelompok dengan mutasi EGFR positif dan kelompok wild type ($p < 0,05$). Ekspresi tertinggi ditemukan pada pasien dengan mutasi L858R di ekson 21.

Kesimpulan: Terdapat hubungan antara peningkatan ekspresi miR-361b-5p dan keberadaan mutasi EGFR, khususnya L858R ekson 21. Hasil ini mendukung potensi miR-361b-5p sebagai biomarker non-invasif untuk prediksi status mutasi EGFR pada pasien adenokarsinoma paru.

Kata kunci: KPKBSK, adenokarsinoma, miR-361b-5p, EGFR, L858R