Clinical effectiveness of osimertinib in non-small cell lung cancer patients with EGFR mutation between plasma and tissue re-biopsy: a systematic review and meta-analysis of real-world evidence

Wan-Chi Wu[1], Kai-Cheng Chang[1], Hui-Yu Chen[1]

[1] Department of Pharmacy, Chang Gung Memorial Hospital, Linkou, Taoyuan, Taiwan.

Background

- Osimertinib is the third-generation epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor (TKI) that is approved for non-small cell lung cancer (NSCLC) patients with refractory to first or second-generation TKI and EGFR T790M mutation.
- Plasma and tissue re-biopsy are the most common method to detect T790M. However, the real-world effectiveness of osimertinib between plasma and tissue re-biopsy remain unclear .

Objective

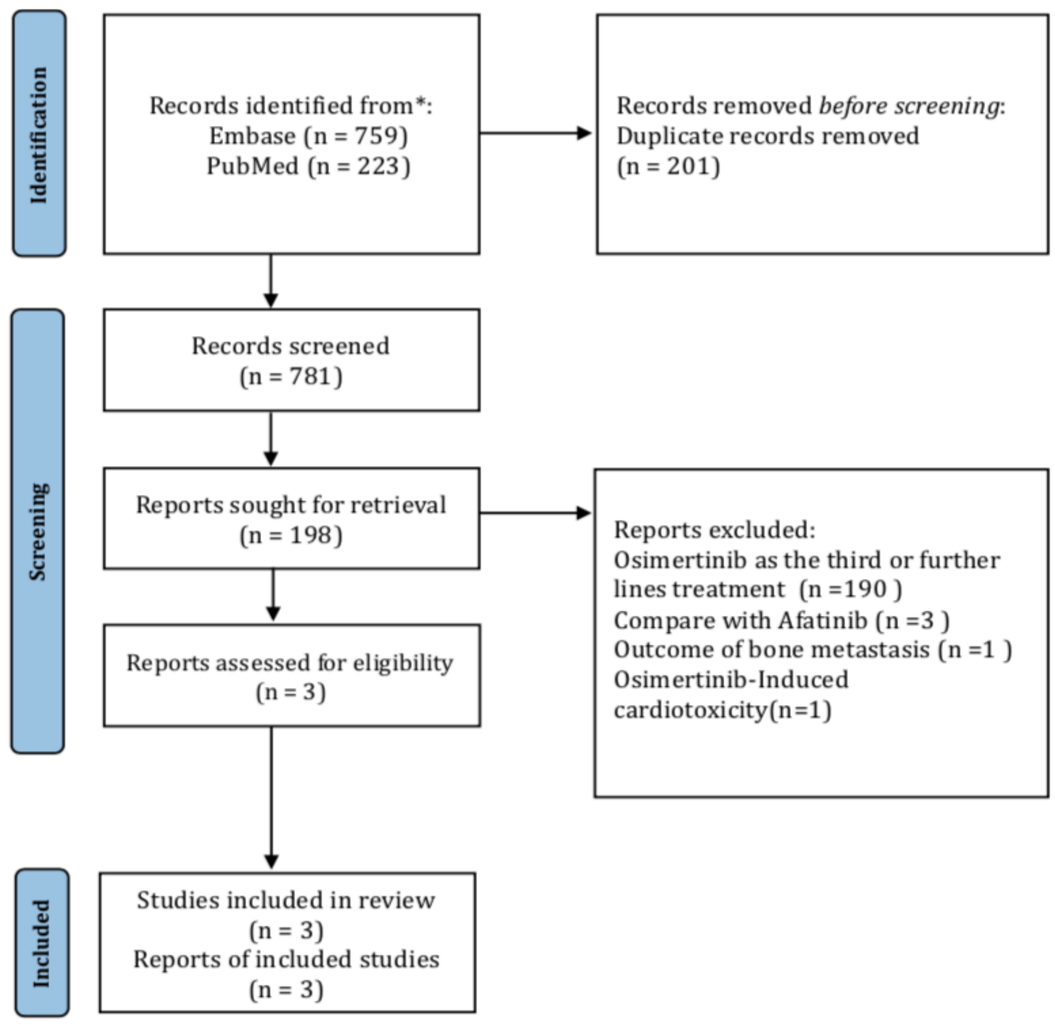
- This study aimed to compare the clinical effectiveness between plasma and tissue re-biopsy .

Methods

- We systematically searched on Pubmed, Embase and Cochrane library databases for studies that were published form January 2016 to December 2021. The terms we searched were “non-small cell lung cancer”, “osimertinib”, ”biopsy”. There were two authors independently to screen all studies, extract data and assess the risk of bias. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline was followed. The studies met following criteria were included: (1) advanced NSCLC, (2) the effectiveness of plasma and tissue re-biopsy after the first line EGFR-TKI treatment, (3) osimertinib as the second line EGFR-TKI treatment, (4) observation study. In meta-analysis, we applied pooled hazard ration (HR) and 95% confidence interval (95%CI) to compare the progression-free survival (PFS) and overall survival (OS) between plasma and tissue re-biopsy.

Results

- PRISMA study flow chart is illustrated in Figure 1. Our search identified three articles after removing duplicates and screening . Among them , three cohort studies with a total of 355 (tissue vs. liquid biopsy: 209 vs. 146) T790M mutation NSCLC patients receiving osimertinib met our inclusion criteria and were included in our study.
- The median PFS for tissue- and plasma-based detection of T790M mutation were 13.0 to 17.2 and 7.4 to 19.4 months, respectively. In pooled analysis, tissue biopsy was associated with better PFS compared to liquid biopsy (HR: 0.57, 95% CI: 0.35 – 0.92)
- Figure 1 .



Conclusions

- Osimertinib as second-line treatment in non-small cell lung cancer patients detected T790M by tissue re-biopsy was associated with better clinical benefit than plasma rebiopsy.