EGFR Inhibitor Associated Paronychia: Integrated Signal Detection and Bioinformatics Analysis

RWD174

Gouri Nair[1], Ummai Salma A[1], Bharathi B A[1], Spandana J[1], Mohammed Salim[2]

1 Dept of Pharmacology, Faculty of Pharmacy, M S Ramaiah University of Applied Sciences, Bengaluru, India

2 Dept of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal, India

INTRODUCTION

Signal detection is an emerging field in pharmacovigilance that helps identify adverse events not seen in pre-marketing trials.

Epidermal growth factor receptor inhibitors (EGFRi), used to treat various cancers, act by selectively blocking EGFR-expressing tumor cells

Paronychia, a painful inflammation of the nail fold, can be acute or chronic. Studies report that patients receiving EGFR inhibitors such as Gefitinib, Erlotinib, or Osimertinib for stage IV adenocarcinona often develop paronychia, especially on the thumb and great toe.

OBJECTIVE

- **The objective of this study was to evaluate the possible association between EGFRi and the occurrence of paronychia through disproportionality analysis and to investigate the potential molecular pathways underlying this relationship**

METHODOLOGY

Data Source
FDA's Adverse Event Reporting System (FAERS) via OpenVigii 2.1 (2004Q1–2025Q1)

Study Term & Drugs
"Paronychia" associated with Afatinib, Erlotinib, Dacomitinib, Gefitinib

Analysis Method
Drug–Event Combination (DEC) assessed using Reporting Odds Ratio (ROR) for disproportionality

Signal Criteria
Positive signal defined as ROR–1,96SE > 1 with ≥3 co-occurrences

Signal Refinement
Performed by gender and age, excluding reports involving known paronychia-causing drugs (MEK inhibitors, Retinoids, Protease inhibitors, Chemotherapeutics)

Mechanistic Exploration
Off-target interactions identiffied vía STITCH and BindingDB; validated through molecular docking

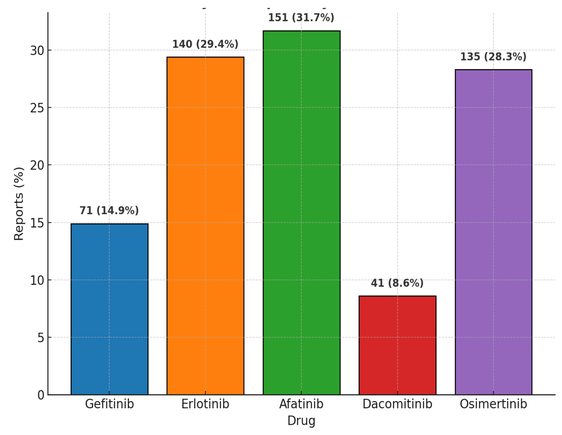
RESULTS

A total of 2,092 cases of paronychia were reported in FAERS, of which 476 were associated with EGFRi

476

65 The median patient age was (IQR: 61–75)

Number of Reports



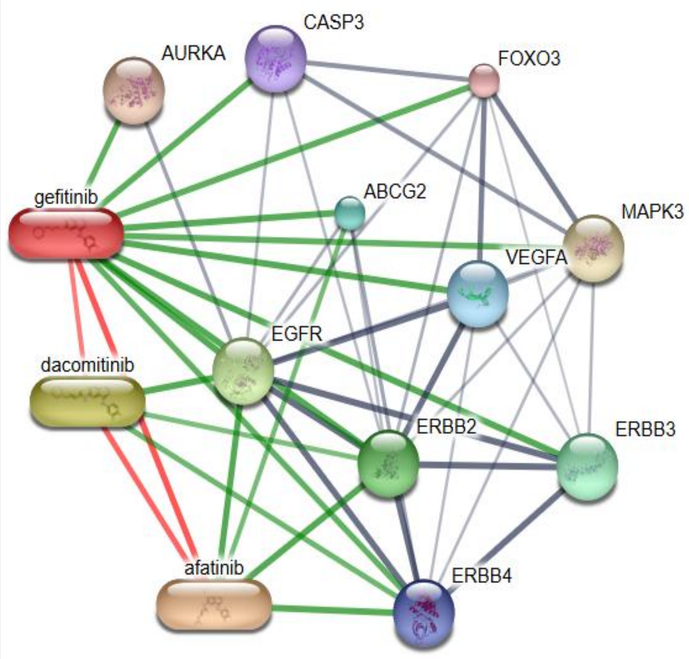
Signal Strength

EGFRi	63.015 (56,988 ; 68,782)
Gefitinib	74.613 (58.813 ; 94,659)
Erlotinib	31.027 (26.128 ; 36.845)
Afatinib	276.122 (233.263 ; 326.855)
Dacomitinib	518.775 (376 295 ; 715.203)
Osimertinib	41.916 (35.189 ; 49.928)

Subgroup Analysis

Category	ROR (95% CI)	Number of Reports
EGFRi	63.015 (56.988 ; 68.782)	476
Refined Signal	61,725 (55.797 ; 66.244)	459
Male	41.862 (34.538 ; 50.74)	126
Female	79.302 (69.231 ; 90,839)	285
<18yrs	NA	1
19–65yrs	85.654 (71.868 ; 102,085)	151
>65yrs	91.154 (76.787 ; 108.21)	204

Drugs –Targets interaction



GENE CARDS ANALYSIS
610 genes associated with paronychia

OFF-TARGET ANALYSIS
Afatinib and gefitinib interact with ABCG2 (Docking score: –6,3)

Dacomitinib was found to interact with ERBB2 and ERBB4 (Docking scores: –4,3 and –8,2)

CONCLUSION

EGFRi are possibly associated with paronychia, with Dacomitinib showing the highest signal strength.

Off-target interactions involving ABCG2, ERBB2, and ERBB4 may contribute to the underlying pathophysiology.

These findings underscore the importance of further investigatior into the molecular basis of this adverse event.

REFERENCES

- Zubair T, Bandyopadhyay D. Small Molecule EGFR Inhibitors as Anti-Cancer Agents: Discovery, Mechanisms of Action, and Opportunities. Int J Mol Sci. 2023 Jan 31;24(3):2651.
- Wollina U. Systemic Drug-induced Chronic Paronychia and Periungual Pyogenic Granuloma. Indian Dermatol Online J. 2018;9(5):293–8. fda-adverse-event-reporting-system-faers-public-dashboard
- Research C for DE and. FDA Adverse Event Reporting System (FAERS) Public Dashboard. FDA [Internet]. 2023 Dec 7 [cited 2025 Mar 11]; Available from: https://www.fda.gov/drugs/fdas-adverse-event-reporting-system-faers/

Contact Us

neethugouri@gmail.com, Phone: +91-9400422075

RAMAIAH UNIVERSITY OF APPLIED SCIENCES