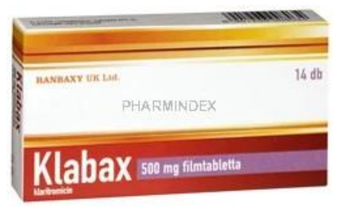
STEADY-STATE CONCENTRATIONS OF CLARITHROMYCIN UNDER DIFFERENT ROUTES OF ADMINISTRATION IN PNEUMONIA: RISK-FACTORS AND CLINICAL OUTCOMES

A. FÉSÜS [1], É. KOVÁCS [1], ZS. SZILÁGYI [1], I. BAK [1], I. BÁCSKAY [2], I. LEKLI [1], A. VASKÓ [3]

[1]Department of Pharmacodynamics, Faculty of Pharmacy, University of Debrecen, Hungary
[2]Department of Pharmaceutical Technology, Faculty of Pharmacy, University of Debrecen, Hungary
[3]Department of Pulmonology, Faculty of Medicine, University of Debrecen, Hungary

Background and importance

Appropriate antibiotic dosage is crucial for improving outcomes in critically ill patients facing pneumonia.



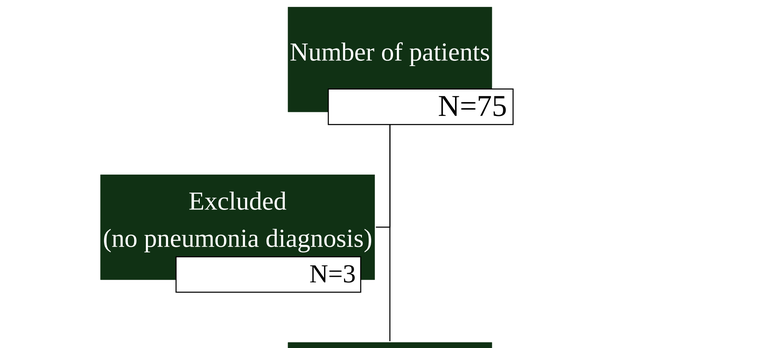
Aim and objectives

Our research aimed to evaluate the development of clarithromycin (CLAR) steady-state concentration (Css) in this patient population across different routes of administration, identify influencing factors, and examine the relationship between clinical outcomes and Css.

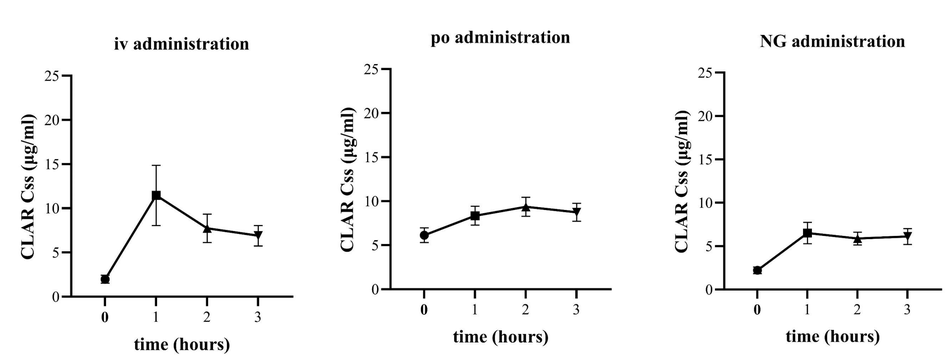
Materials and methods

Study design: single-center prospective observational study
Study location: ICU of a pulmonology department
Study period: 2 February 2025 - 05 December 2025
Study target group: adults with pneumonia treated with empirical CLAR (500 mg two times a day)
Routes of administration: intravenous (IV), oral (PO), and nasogastric (NG)
Blood sample collection: at steady-state (on day 3 of the CLAR administration)
- ✓ One sample for albumin level
- ✓ Four samples for CLAR serum levels: at time 0 (before), 1, 2, and 3 hours after CLAR administration

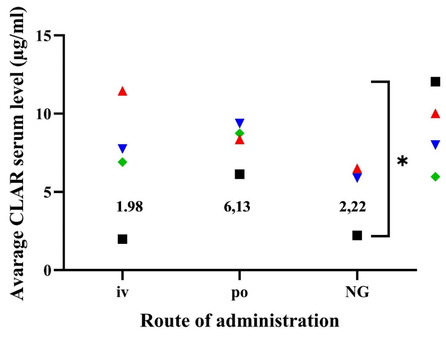
CLAR serum level determination: by LC-MS/MS (using a CLAR EuPh Ref. St. by Merck)
Ethics approval: DE RKEB/IKEB: 7094-2025



Results

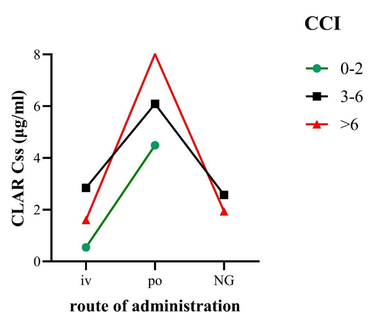


CLAR serum levels followed the expected pharmacokinetics for all routes of administration.

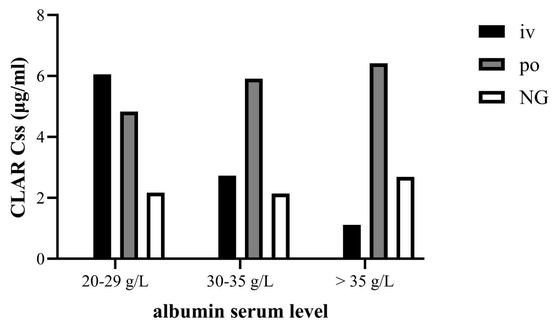


CLAR Css was 3-fold higher for PO than for IV and NG administration.

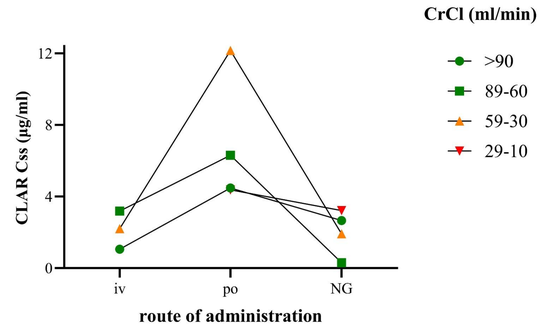
Influencing factors



Css increased with Charlson Comorbidity Index.

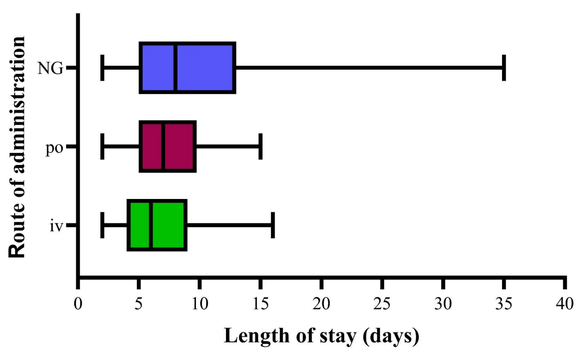


Albumin levels strongly influenced Css.
Does CLAR inhibit its own metabolism at high Css?

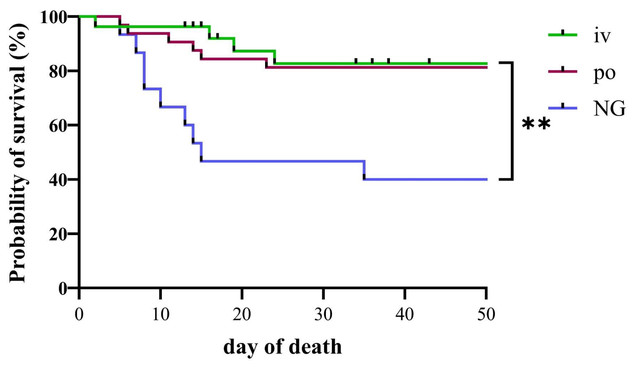


CrCl (< 59ml/min) increased serum levels.

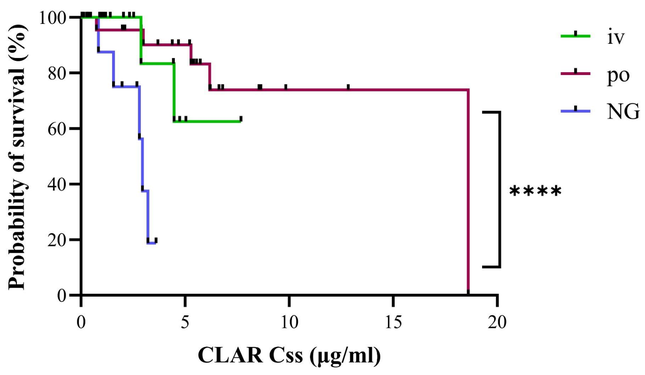
Clinical outcomes



No significant difference in length of stay.



30-day survival was significantly higher with iv and po administration (82% and 80%, respectively, vs 46%).



Higher Css did not improve the probability of survival.

Conclusions

PO administration presented the highest CLAR Css levels. CrCl, albumin levels, and CCI were found to be influencing factors of CLAR Css. PO and IV administration resulted in similar clinical outcomes. Higher Css levels did not improve clinical outcomes.

Resources
Project no. TKP2021-EGA-18 and TKP2021-EGA-19 has been implemented with the support provided by the Ministry of Culture and Innovation of Hungary from the National Research, Development and Innovation Fund, financed under the TKP2021-EGA funding scheme.