

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



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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 (C_{ss}) in this patient population across different routes of administration, identify influencing factors, and examine the relationship between clinical outcomes and C_{ss}.

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)

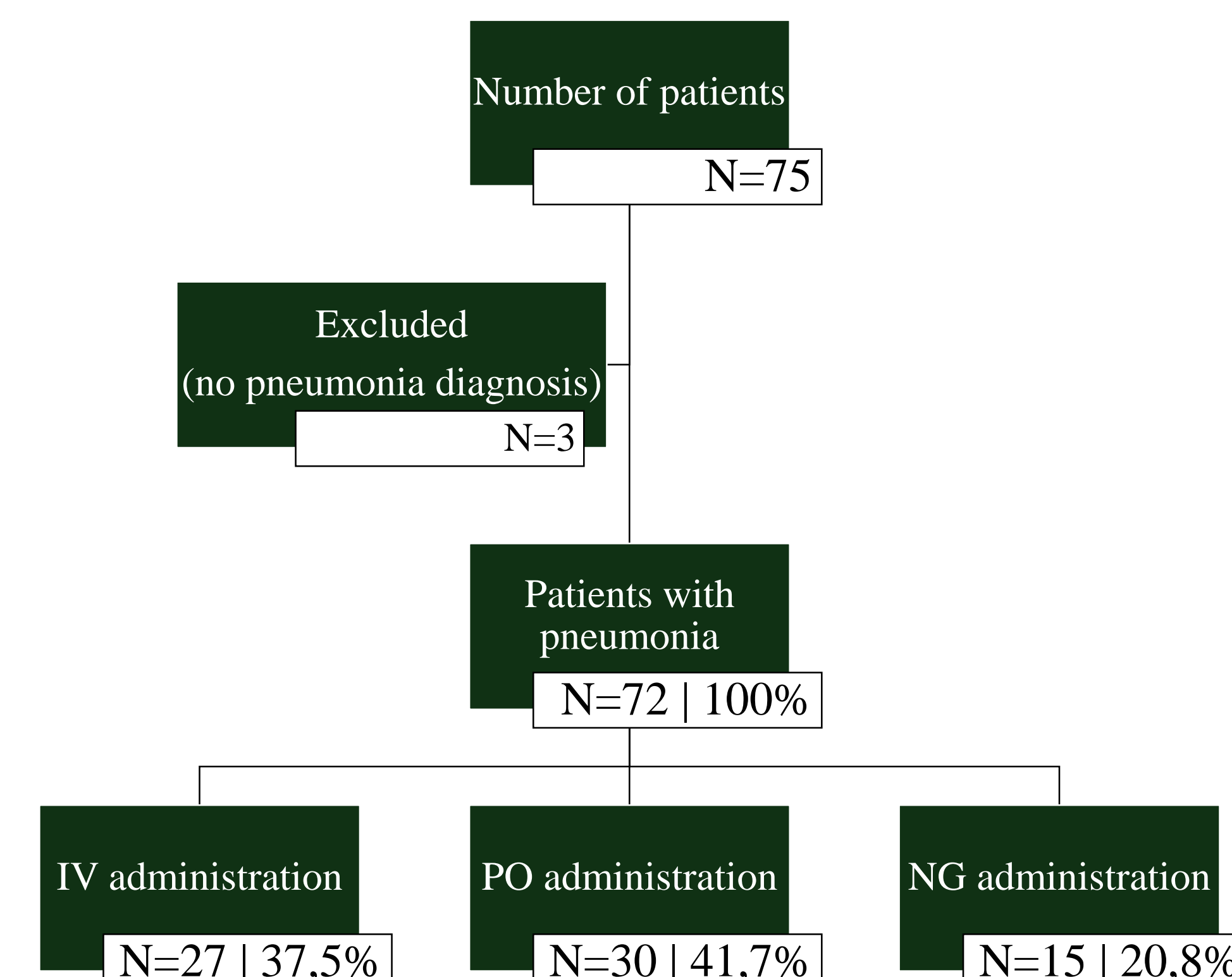
Blood sample collection: at steady-state (on day 3 of the CLAR administration)

✓ One sample for albumin level

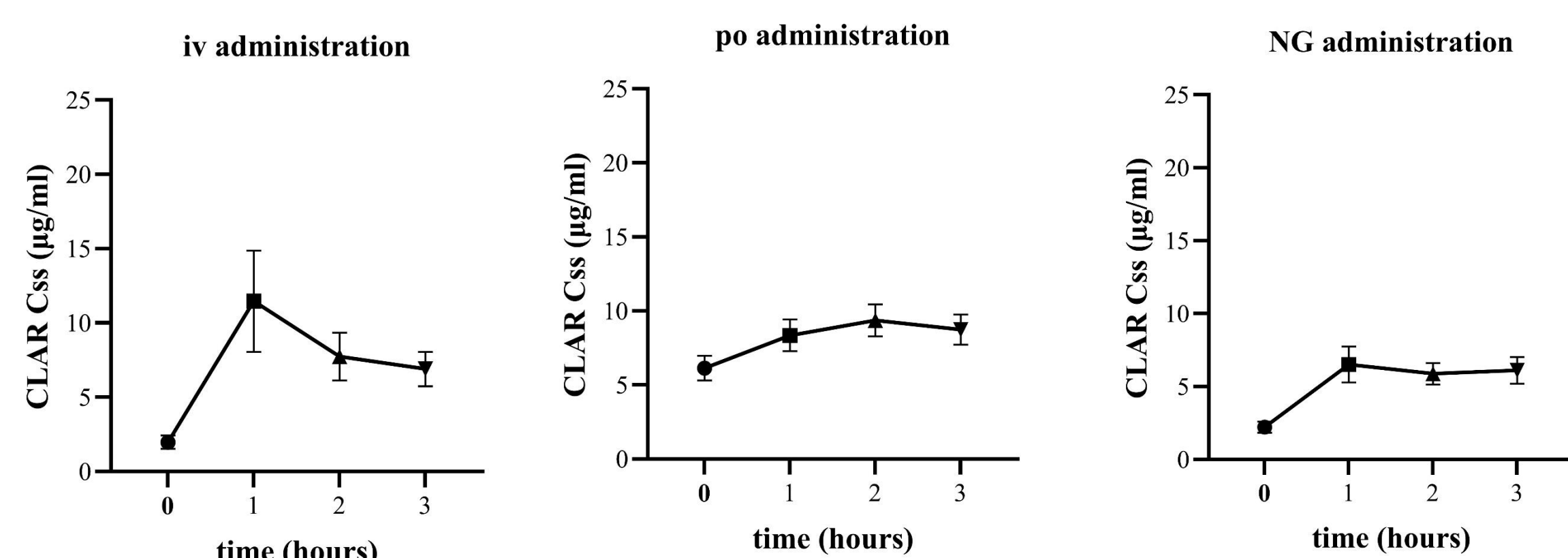
✓ Four samples for CLAR serum levels: at time 0 (before), 1, 2, and 3 hours after CLAR administration

CLAR serum level determination: by LC-MS/MS (using a CLAR EuPh Ref. St. by Merck)

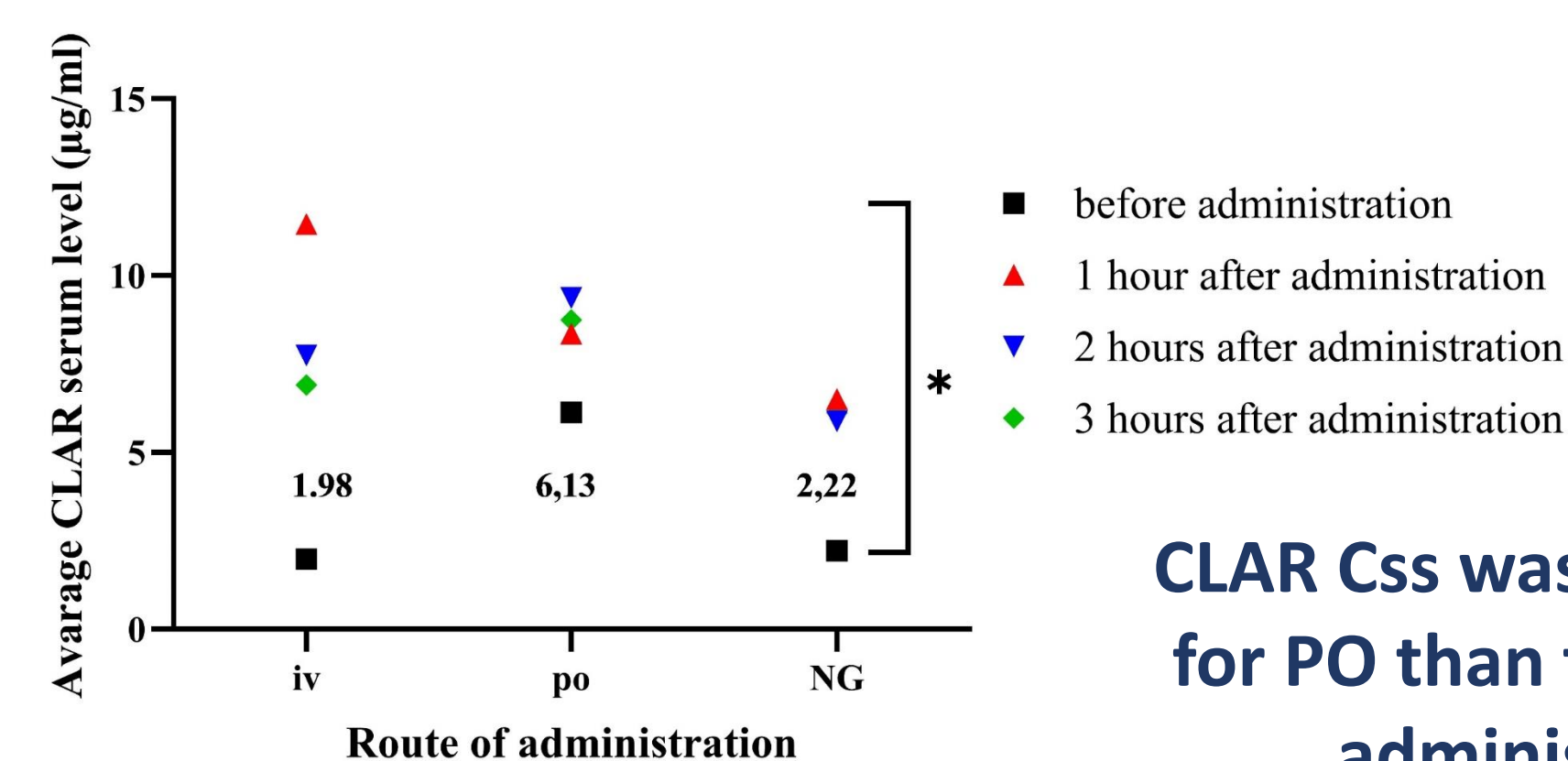
Ethics approval: DE RKEB/IKEB: 7094-2025



Results

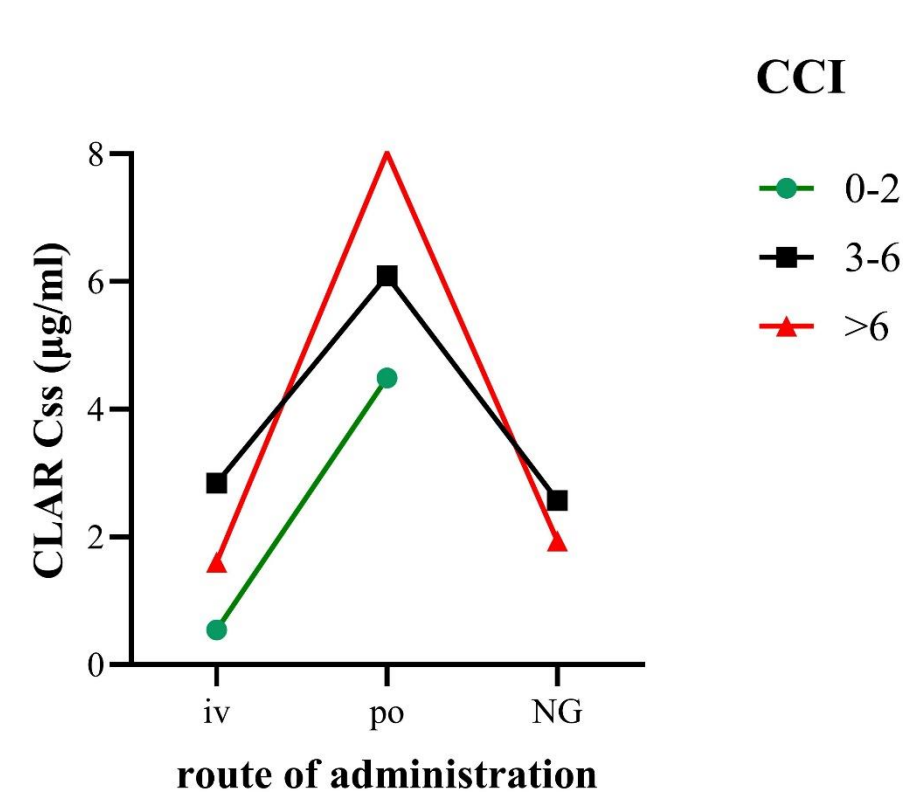


CLAR serum levels followed the expected pharmacokinetics for all routes of administration.

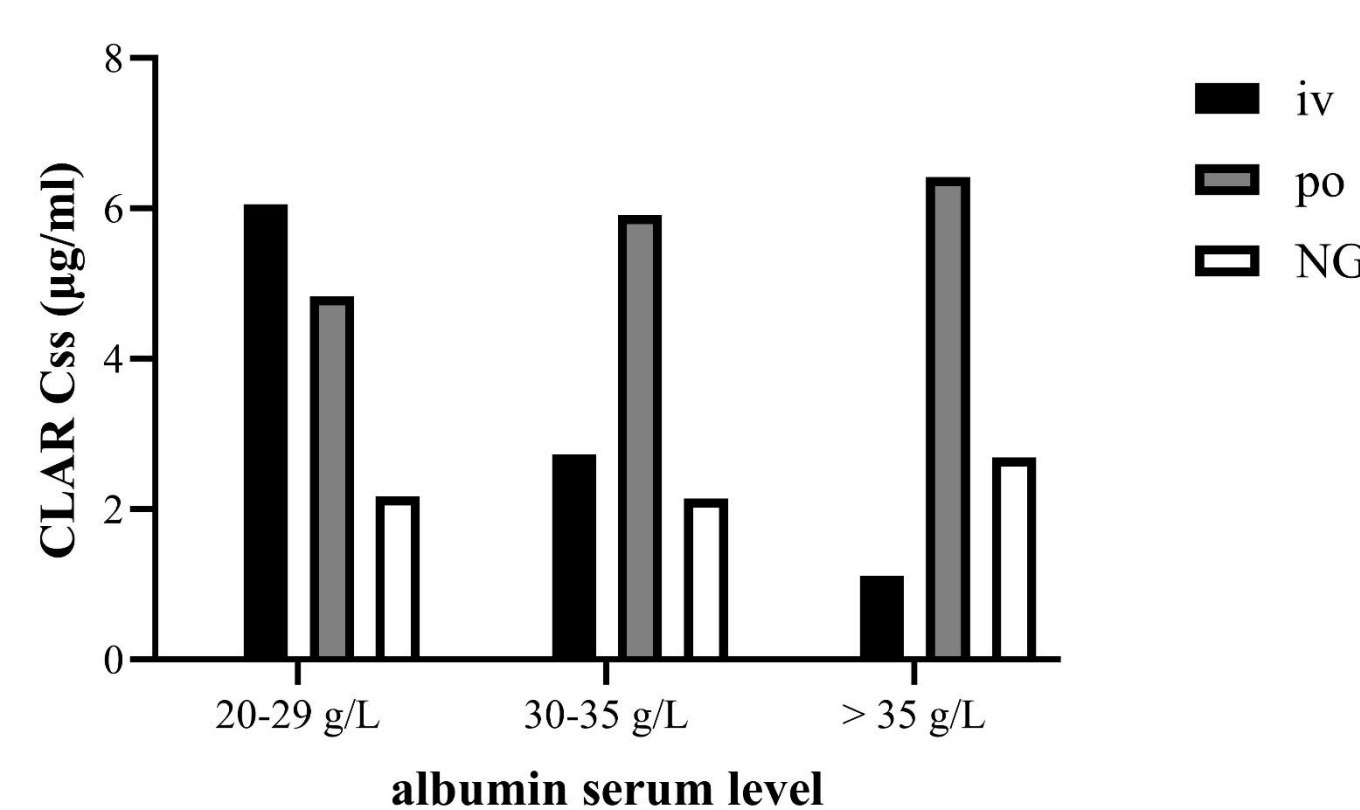


CLAR C_{ss} was 3-fold higher for PO than for IV and NG administration.

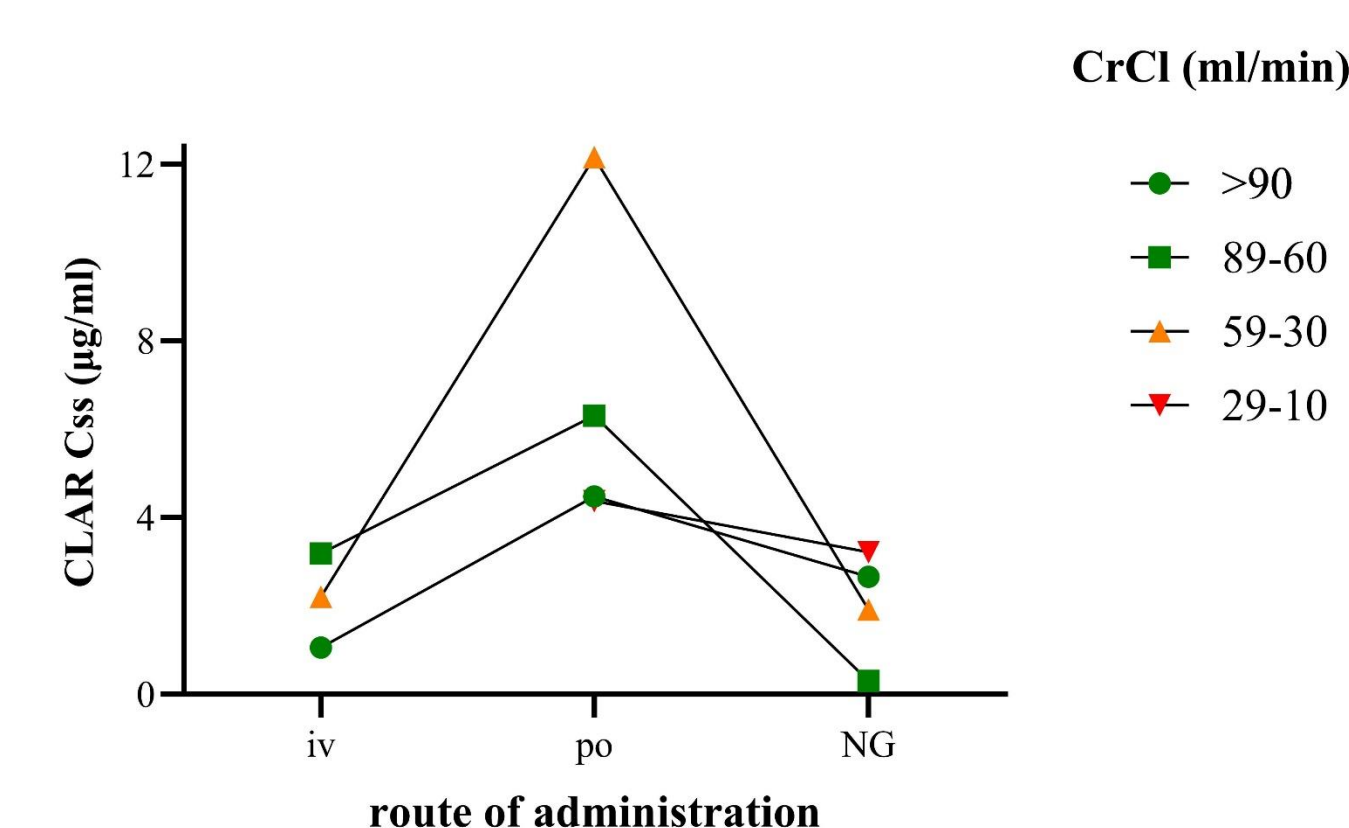
Influencing factors



C_{ss} increased with Charlson Comorbidity Index.

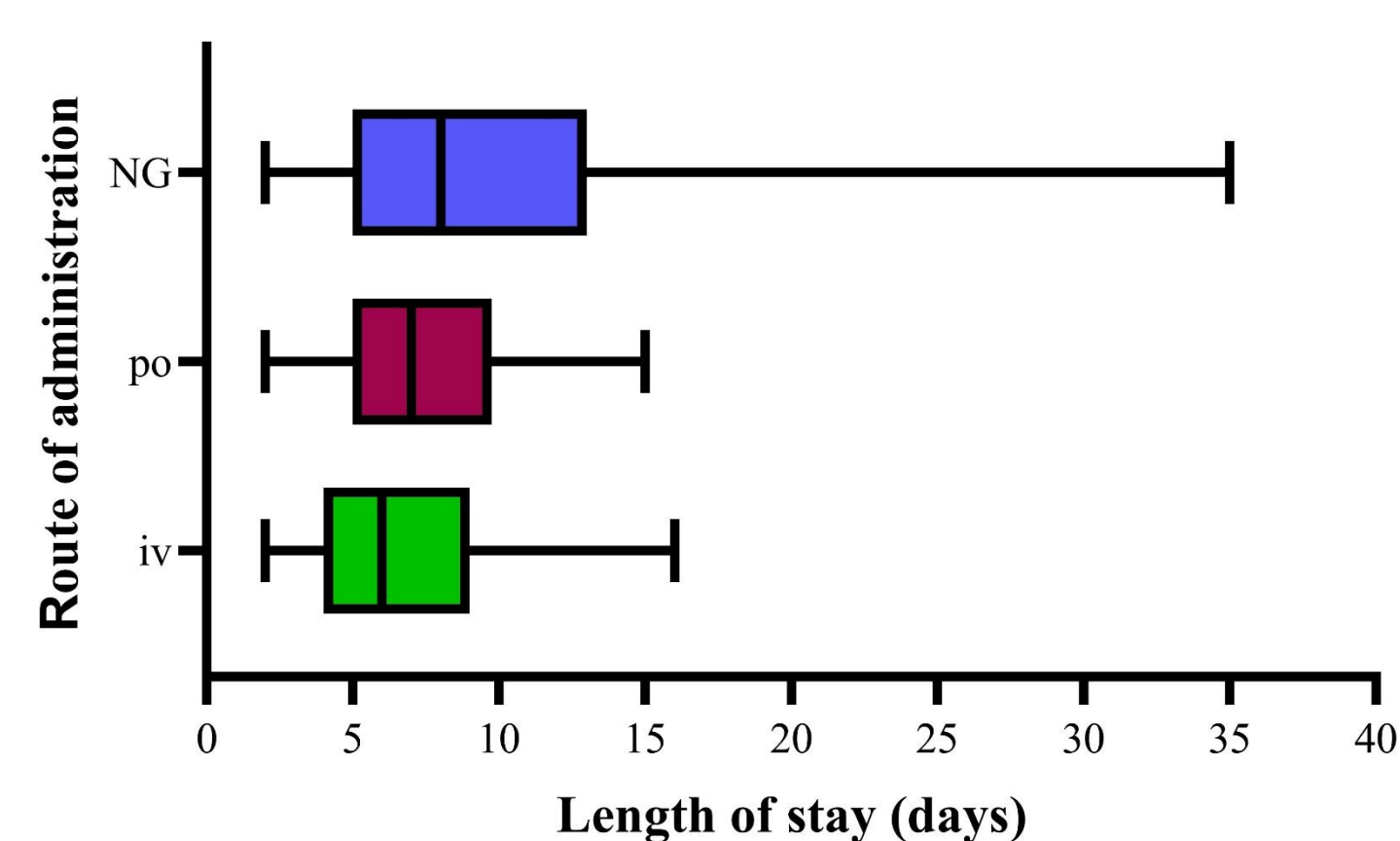


Albumin levels strongly influenced C_{ss}. Does CLAR inhibit its own metabolism at high C_{ss}?

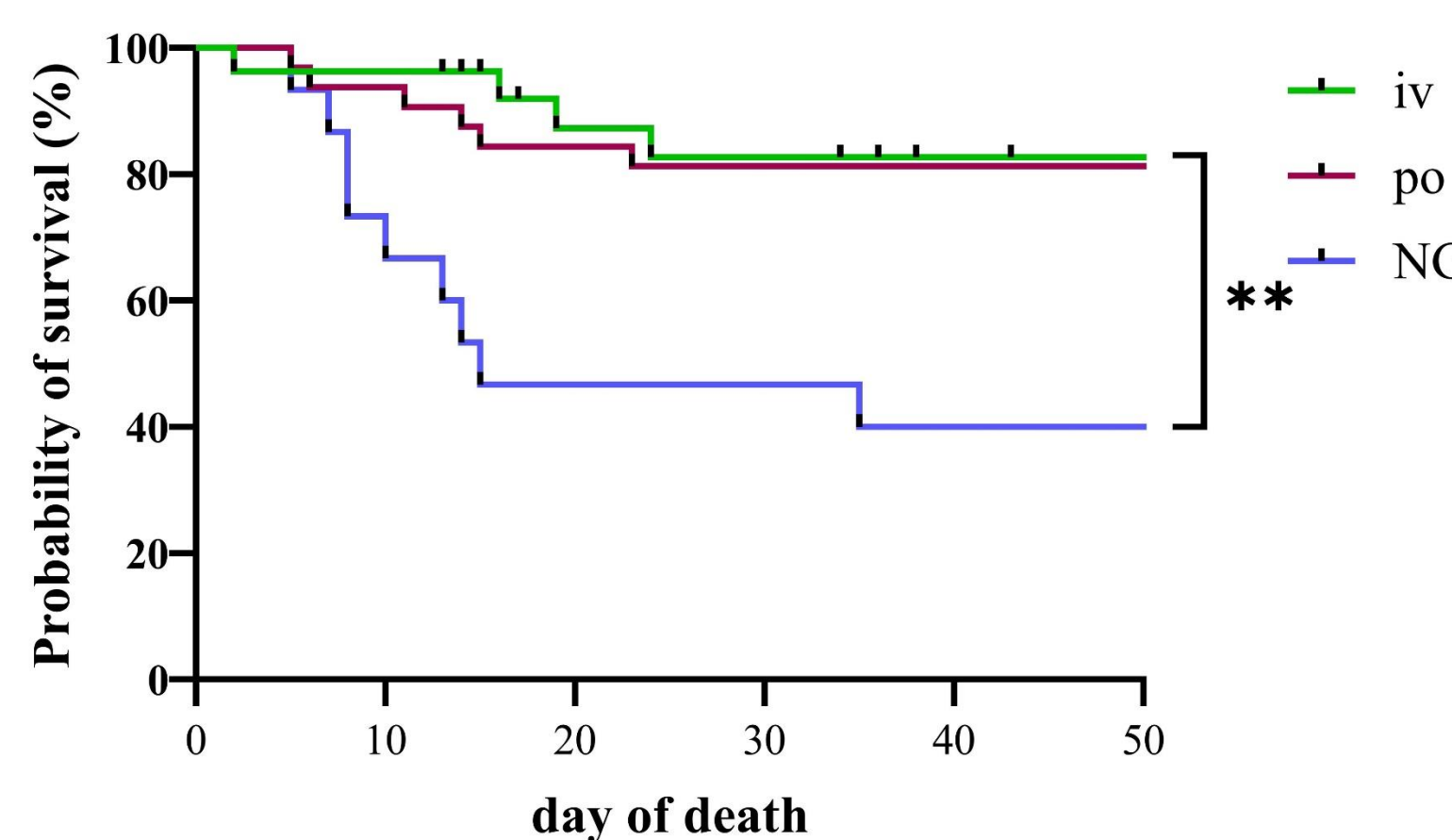


CrCl (< 59ml/min) increased serum levels.

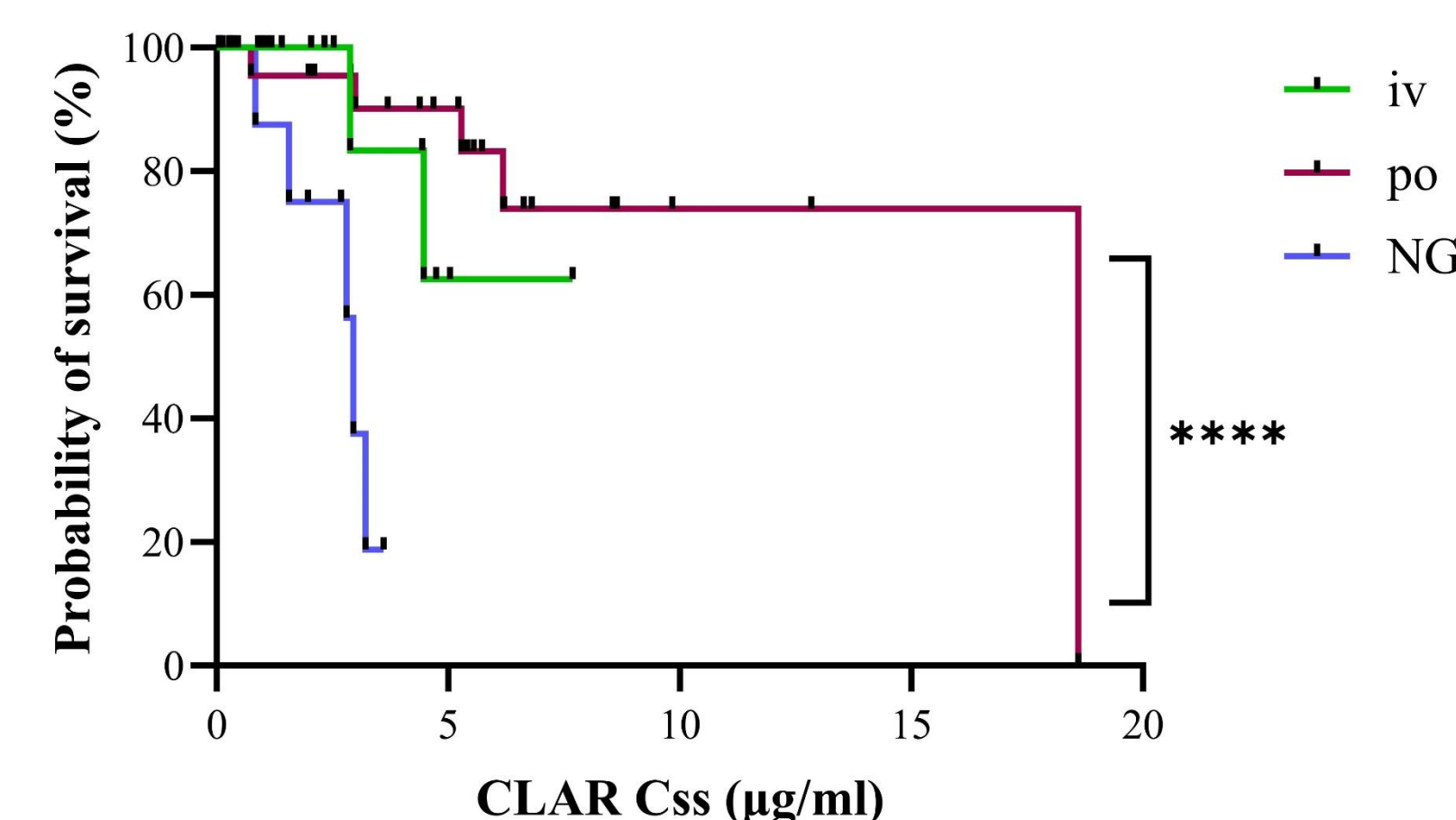
Clinical outcomes



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 C_{ss} did not improve the probability of survival.

Conclusions

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

Resources

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