Predicting Mucosal Healing in IBD: The Interplay of Platelet Levels and Infliximab Pharmacokinetics

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Introduction

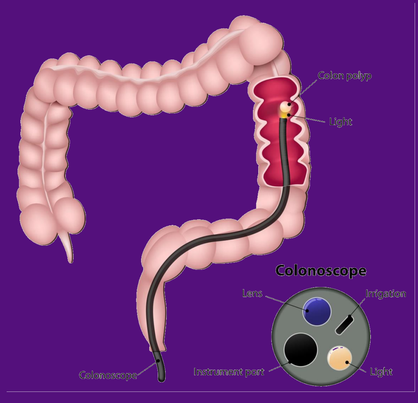
Challenge to maintain stable disease

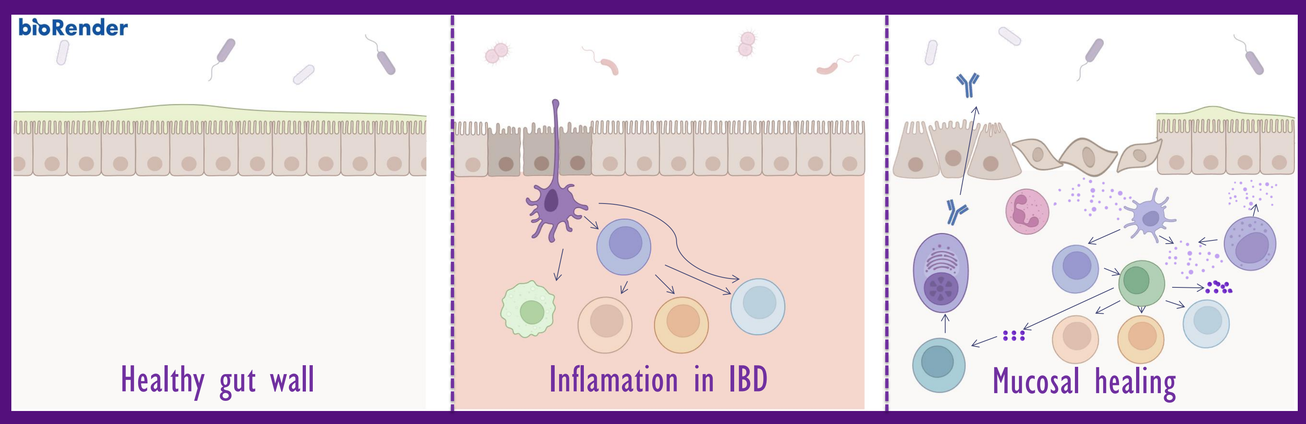
Mucosal healing (MH) - assessed by endoscopy - the most reliable indicator of remission

Endoscopic procedures: 🕐/€ consuming, uncomfortable for patients

🔍 measurable biomarkers that reliably reflect MH

Platelet (PLT) count as a reliable predictor





Objective

In this study, we aim to investigate how PLT levels intertwined with infliximab (IFX) pharmacokinetics, especially clearance (CL), influence the achievement of MH

Methods

✓ Retrospective study from patients' charts – until endoscopic evaluation, up to 104 weeks

✓ 248 patients (male 58.5%, age at diagnosis 36.5 (17-76) years, baseline weight 73.5 (43-110) kg)

✓ **IFX dosing:**

D = 200-800 mg ; Ti = 2 h; $\tau_{induction}$ = standard (week 0, 2, 6)/accelerated (every or every other week); $\tau_{maintenance}$ = every 4, 6 or 8 weeks

✓ $PRIOR subroutine for model building in NONMEM 7.5 software

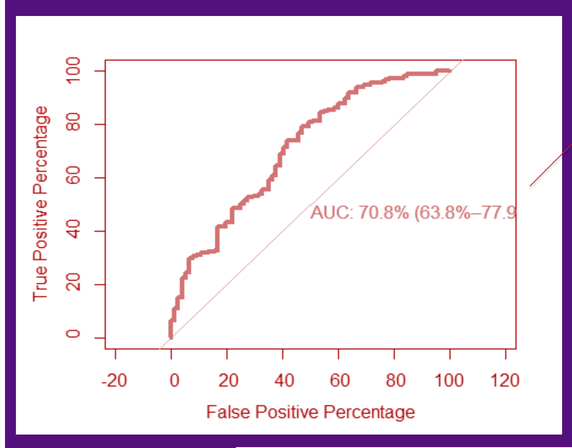
✓ Data processing using R software in RStudio (version 2025.09.1+401)

✓ Normality: Shapiro-Wilk test; Group comaprison: Student's t-test or Mann-Whitney U test

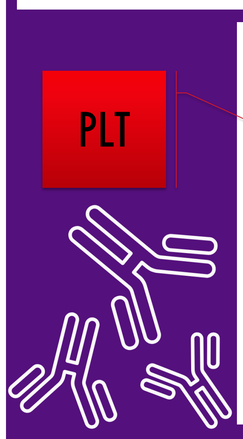
✓ Diagnostic performance of variables: Univariate binary logistic regression

✓ Combined influence on probability of MH achievement: Multiple regression analysis

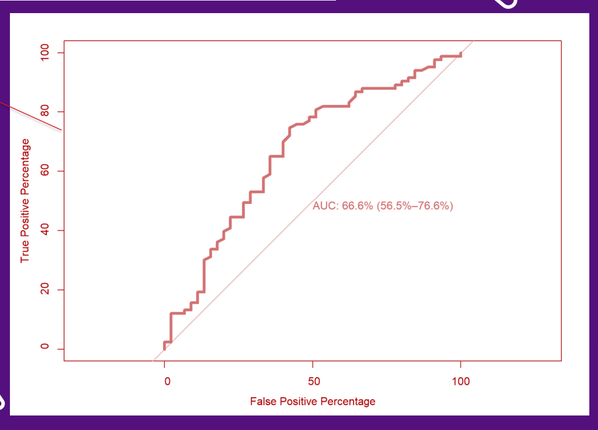
Results



CL



PLT

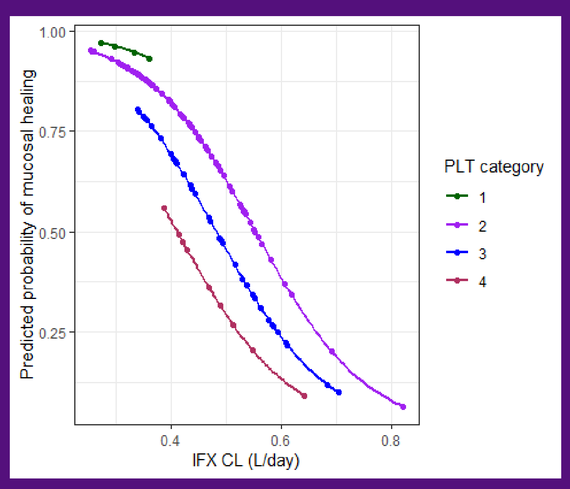


Out of 248 patients, 77 (31%) did not achieve MH during IFX treatment. Patients that achieved MH had lower median CL (0.412 L/day vs 0.494 L/day, $p < 0.05$) indicating lower drug exposure in unstable cohort. Median platelet levels were higher in patients without MH achievement (307•10⁹/L vs 260•10⁹/L, $p < 0.05$) indicating higher inflammation burden which contributes to lower IFX concentrations and unstable disease status.

Univariate logistic regression suggested IFX CL could be a good predictor of MH ,while PLT levels had slightly less promising results. In multivariate analysis, patients were stratified by PLT levels: **low** <150•10⁹/L, **normal** 150-300•10⁹/L, **high normal** 300-400•10⁹/L and **high** >400•10⁹/L. Statistically significant difference was observed between subcategories (p = 0.0288). Patients with high PLT levels had lower MH probability (<60%) and higher drug CL. Patients in low PLT level cohort had lower drug CL and a high probability of MH achievement (>90%). Normal PLT level patients had various CL values, and any probability to achieve MH, while the high normal ones had slightly higher CL and slightly lower probability (<80%).

Conclusion

Both IFX CL and PLT levels are important determinants of MH in IBD patients. The achievement of MH is predicted well by IFX CL. PLT levels should be considered as a promising and routinely available biomarker together with IFX pharmacokinetics to predict response in IBD patients.



Acknowledgement

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