was performed: CRP, hs-CRP D-dimers, fibrinogen, TNF$\beta$, TGF$\beta$1, matrix metallopeptidase 2 (MMP2), neutrophile to lymphocytes ratio (NLR), C3 and C4 seric complement, homocysteine, and IL-6. Quantification of the protein markers was performed from the patients' serum; blood samples from patients were centrifuged at 1000*g* for 15 minutes. Afterwards, the serum was separated and it was aliquoted and stored at −80°C. The samples were collected 24 hours before and after revascularisation.

**Results:** The results were quantified in terms of profiling patients with CLTI. The main outcomes were major limb amputation or death. Cox regression showed that patients who had negative outcomes had higher values of biomarkers pre-operatively, with an increased value post-operatively, especially in case of CRP, hs-CRP, NLR, IL-6 ($p > .010$). A very significant correlation was found between CRP, hs-CRP, NLR, and Il-6 with the ankle−brachial index (95% CI, $p = .0001$). Patients who had a good outcome after the revascularisation had a decrease in the biomarkers analysed, which correlated with the clinical status of the patients.

**Conclusion:** It is believed that further studies are needed to identify the targeted feasibility of using inflammatory markers in the diagnosis, prognosis, and treatment of critical ischaemia in practice.

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**Abstract O-013**

## Tailored Risk Assessment and Forecasting in Intermittent Claudication: A Proof of Concept Decision Support Tool

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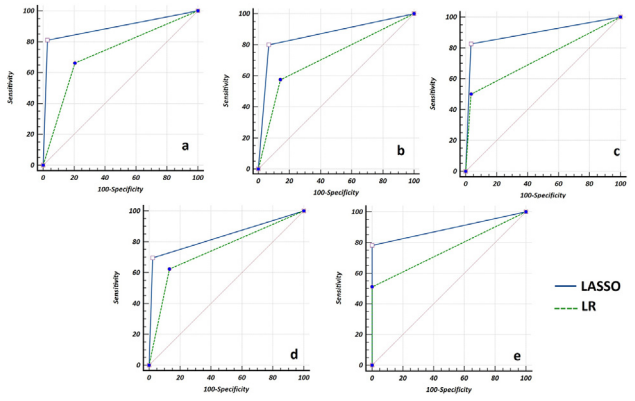
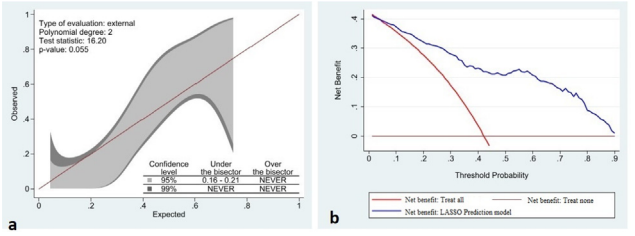
**Objective:** Current guidelines advocate for cardiovascular risk reduction and supervised exercise therapy as the primary intervention for patients with intermittent claudication (IC). Despite these recommendations, variability in management and outcomes persists due to implementation challenges and suboptimal patient adherence. A machine learning based decision support system was designed to offer personalised outcome predictions for various initial management strategies, enhancing the precision of patient care.

**Methods:** Utilising the least absolute shrinkage and selection operator method for feature selection(LASSO), the model was developed from a bootstrapped sample of 10 000 patients, originating from 255 patients at the vascular centre. It incorporates 27 baseline characteristics, adherence to best medical therapy/smoking cessation, and initial treatment strategy. Validation was performed with a separate dataset of 254 patients. The data set consisted of patients with IC (Rutherford 1 − 3) who were referred to the vascular clinic from December 2014 to March 2018. Their clinical progression was followed from the time of presentation until the most recent follow up. Missing data in the training and validation sets were compensated for using a multiple imputation by chained equations framework. Outcome class imbalance was addressed using random oversampling. The decision support system, built in R using lasso, glmnet and shiny packages, features a dropdown menu for each predictor, facilitating the assessment of two and five year risks for chronic limb threatening ischaemia (CLTI), major adverse cardiovascular events (MACE), major adverse limb events (MALE), and revascularisation across different treatment strategies. The system's utility is further enhanced by generating binomial deviance curves, which offer insights into the model's fit and predictive accuracy, alongside calibration curves that compare predicted outcomes with actual events, thereby ensuring reliability. The effect size and model accuracy metrics provide a quantitative measure of the model's predictive power and overall performance.

**Results:** The AUROC curves demonstrated excellent discrimination for the risk of progression to CLTI at two (0.892) and five years (0.866), and the likelihood of MACE (0.836), MALE (0.891), and revascularisation (0.896) within five years, regardless of the initial treatment strategy. Calibration curves revealed a strong alignment between predicted and observed outcomes (test statistic = 16.2; $p = .055$), affirming the model's reliability. The binomial deviance curve, alongside decision curve analyses, underscored the model's clinical utility by illustrating its accurate fit to the binary outcomes. With an accuracy exceeding 80% and an effect size greater than 0.5, this proof of concept decision support tool stands as a robust instrument for guiding treatment decisions.

**Conclusion:** The developed decision support system adeptly forecasts outcomes for IC patients across various initial treatment strategies, promising enhanced risk stratification and improved patient outcomes. By providing personalised outcome predictions and leveraging comprehensive analytical tools such as the binomial deviance curve and calibration curves, the system empowers clinicians with a sophisticated tool for informed decision making, ultimately aiming to optimise patient care and management in the face of IC.

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