Category : **Sepsis: biomarkers**

A171 - *Using the cardio-vascular index (cvri) to predict mortality in septic shock*

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Introduction:
The Cardio-Vascular Index (CVRI) is a multi-vital sign index suggesting promising association with diverse conditions and morbidities along the entire hemodynamic spectrum [1, 2, 3, 4]. Our study aimed to evaluate CVRI predictability of death in septic shock.

Methods:
Dataset included adult patients stayed at Beilinson hospital ICU for more than 48 hours (2012-2018). This study uses a cohort of 2,122 patients. CVRI patterns along 48 hours from ICU admission were computed. Five machine learning (ML) classification algorithms were trained and tested for the development of prediction model of ICU mortality (Python software). We compared models using admission conditions only with models adding CVRI. Prediction performance was assessed by the Receiver Operating Characteristics area under the curve (AUC) of ten-fold cross-validation and validation sets. The study was authorized by the local IRB.

Results:
In the cohort, the median (IQR) age was 63 (49-72) years, BMI 26 (23-31). Main admission conditions: surgical (40%), trauma (28%) and medical (21%). Septic shock was detected in 509 patients (24%). The best performing ML algorithm was Random Forest classifier. The model adding CVRI was preferable (AUC=0.85) over model including admission conditions only (AUC=0.77) (Figure 1).

Conclusion:
CVRI values of the first 48 hours added to admission conditions were good predictors of death in septic shock. CVRI had an added value in predicting death over the existing admission conditions. This index may improve overall identification of high-risk patients.

References:
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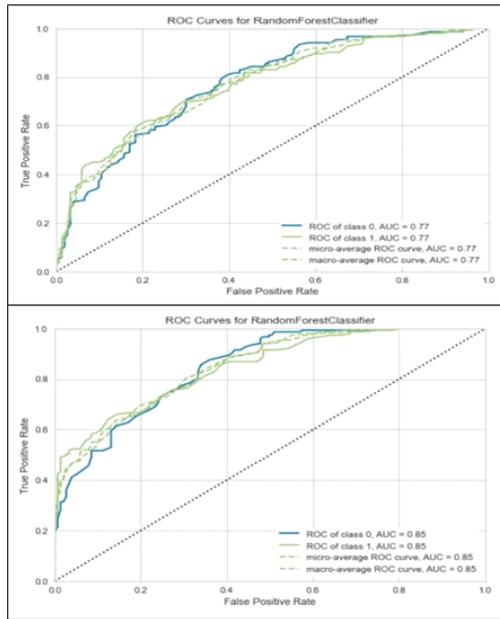
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Figure 1: ROC Curves: admission conditions model (top) admission conditions & CVRI model (bottom)