Category : **Nutritional support**

A132 - *Using machine learning to compare gastric residual volume thresholds as predictors of clinical outcomes in critically ill patients*

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Introduction:

The aim of the study is to examine the association between feeding intolerance (FI), defined by different gastric residual volume (GRV) thresholds, and clinical outcomes in enterally fed critically ill patients. "Large" GRV is a key criterion used in most FI definitions, yet due to conflicting evidence, the determination of the optimal GRV threshold remained an unresolved issue.

Methods:

We included adult patients (2012-2018) admitted at Beilinson hospital ICU for more than 48 hours. FI definition is based on the occurrence of "large" gastric volumes (thresholds of 150, 250 and 500 ml), GI symptoms and "inadequate" delivery of enteral nutrition [1]. Admission conditions and FI occurrences, along 72 hours, were analyzed by machine learning classification algorithms predicting mortality and morbidity. Prediction performance was assessed by the area under the curve (AUROC) of ten-fold cross-validation and validation sets for 3 GRV thresholds.

Results:

The dataset comprised of 1,782 enterally fed patients. The median (IQR) age was 62 (48-72) years, BMI 26.5 (23-31). Main admission conditions: surgical (47%), trauma (27%) and medical (25%). Five algorithms were trained and tested (Python software). The best performing algorithm was Random Forest classifier. Models with GRV threshold of 250 ml achieved the best results (AUC=0.82-0.87, depending on outcome metric), followed by models using GRV threshold of 150 ml (AUC=0.81-0.86) and models using GRV threshold of 500 ml (AUC=0.76-0.85). Valuable predictors in the models were GRV>250 ml or GRV>150 ml in 72 hours.

Conclusion:

FI occurrences along 72 hours of ICU admission, using GRV threshold of more than 250 ml, have the best performance in predicting clinical outcomes in enterally fed critically ill patients.

References:

[1] Reintam-Blaser et al., Nutrition in Clinical Practice 36:1, 2021