
Optimised Prediction of All-Cause Mortality of ICU Patients



Outcomes research on ICU patients requires accurate measures of comorbidity to predict mortality. The Simplified Acute Physiology Score (SAPS3) is widely used and provides some information on comorbidity. The Charlson comorbidity index (CCI) uses general comorbidity measures and may not be sufficiently discriminative. These risk scores use the presence of comorbidity as binary variables but disregard quantitative information. A previous study shows that CCI combined with other administrative data performed as well as physiology-based scoring systems in predicting mortality.

A study was conducted to optimise the prediction of long-term all-cause mortality of ICU patients, using quantitative comorbidity information assessed from hospital discharge diagnoses before intensive care treatment. The goal of the study was to improve the prediction of long-term mortality rate after an ICU stay, using the granularity of hospital discharge history and the impact of the length of follow-up and potential bias introduced by readmission.

Patients admitted to the ICU during 2006-2012 were followed for four years. The performance of comorbidity measures based on the 5-year history of the number of hospital admissions, length of stay, and time since the latest admission in 36 comorbidity categories were compared with CCI and SAPS3.

In 7 years, there were 230,056 ICU admissions and 62,225 deaths among 188,965 individuals. The time interval from the most recent hospital stays and total length of stay within each comorbidity category optimised mortality prediction and provided specific separation of risk categories. Risk separation was also observed within SAPS.

Findings show that comorbidity measures that included the time interval from the most recent hospital stay in 36 different comorbidity categories improved long-term mortality prediction after ICU admission compared to the Charlson index and the SAPS score.

Source: [Critical Care](#)

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