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EDITORIAL

Predicting mortality in the critically ill: a tricky enterprise

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Red blood cell distribution width (RDW) represents the size variation of all red blood cells in a patient. An increase in RDW can result from any disease process that causes the premature release of reticulocytes into the circulation. Thereby, RDW is determined by a large variety of conditions, including erythropoiesis, erythrocyte clearance, iron status, other nutritional deficiencies, renal insufficiency and haemodilution. Inflammation is also thought to increase RDW, due to suppression of erythrocyte maturation and possibly due to enhanced clearance of erythrocytes.[1]

RDW is given routinely as part of a complete blood count panel by an automated flow cytometry machine, rendering RDW an easily acquired and cheap analysis. Thereby, it is advantageous to explore the utility of this test in clinical practice. In this issue, Dr. Meynaar and colleagues report on results of a study on the performance of RDW to predict mortality in a cohort of almost 3000 critically ill patients.[2] They found that RDW is an independent predictor of mortality, which remains after correcting for the most important confounders of mortality. This confirms other findings of an association between RDW and mortality in the critically ill.

An association between RDW and inflammation (reflected by an increase in CRP and leukocyte count) was not found here. This result differs from a previous study performed in >50,000 ICU patients, which employed the same study design, but found that RDW was correlated with infection.[3] This may perhaps be due to a difference in case mix. In the present study, half of the patients were elective surgery patients, who may have experienced blood loss with subsequent iron deficiency. Iron status was not determined in the present study.

Regardless of the mechanism, it is intriguing that the association between RDW and mortality is found not only in cohorts of critically ill patients, which may differ in case mix between centres, but also in a wide variety of other patient populations, including myocardial infarction, heart failure and the general hospital population. This universal finding suggests that RDW may reflect a common pathway in the chain of events that lead to death.

Predicting chances of survival is important in clinical care. It helps physicians to determine futility of treatment and to provide an outlook for patient and relatives on chances of recovery. However, although research in this field is plenty, not many predictors of mortality are used clinically in the decision to withhold or withdraw treatment, including the use of disease severity scores. Consequences of these decisions are irreversible, which leaves no room for doubt on the performance of predictors of mortality. Also, most studies focus on mortality predictors measured at admission, while discussions on futility of treatment typically occur later in the course of ICU treatment. Thereby, with possibly the sole exception of the sensory evoked potential test, prediction scores are not commonly used in discussions about end-of-life decisions.

In my opinion, as long as we do not understand the mechanisms of dying, determining predictors of mortality are useful to gain understanding of how humans die and to stimulate research in this field, but not to guide a treatment decision. Both statements certainly apply to RDW.

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