

## Study: sepsis-induced DIC associated with high mortality



Researchers in Japan conducted a multicentre retrospective observational study to investigate the epidemiology of disseminated intravascular coagulation (DIC) in patients with sepsis. They found that patients with DIC diagnosed by two consensus criteria had higher severity and in-hospital mortality than patients without DIC.

The study results confirm the previous findings that, using consensus criteria, DIC is a common condition co-existing in sepsis and associated with high mortality, according to the researchers.

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DIC associated with sepsis has been considered as a syndrome that should be diagnosed and treated early. The International Society on Thrombosis and Haemostasis (ISTH) established the first international diagnostic criteria for overt DIC in 2001. Afterwards, to facilitate the identification of and early interventions for DIC, the Japanese Association for Acute Medicine (JAAM) proposed new diagnostic criteria in 2006. Although these two criteria have been validated by several studies, validation of DIC diagnostic criteria is not an easy task because there is no gold standard for the diagnosis.

One way to validate DIC diagnostic criteria is to evaluate their ability to predict mortality. In the current study, the researchers assessed the two sets of criteria for their independent association with mortality and their ability to predict mortality. Data from an observational study (Japan Septic Disseminated Intravascular Coagulation [JSEPTIC-DIC] study), conducted in 42 intensive care units in Japan, were analysed. DIC scores were calculated using the ISTH and JAAM criteria. Demographics and clinical characteristics of patients with and without DIC were compared. Multivariable logistic regression analyses were used to assess the association of diagnosis and scores for DIC with in-hospital mortality.

Of 1,895 eligible patients, 1162 (61%) and 554 patients (29%) were diagnosed as having DIC by the JAAM and ISTH criteria, respectively. Patients with DIC had higher in-hospital mortality compared with those without DIC (33% vs. 20% in JAAM and 38% vs. 24% in ISTH). However, in multivariable analysis, the JAAM score (odds ratio 1.026, 95% confidence interval 0.958–1.097;  $p = 0.465$ ) and the ISTH score (odds ratio 1.049, 95% confidence interval 0.969–1.135;  $p = 0.238$ ) did not have an independent association with in-hospital mortality.

"We found remarkable difference in the incidence rate between the two criteria (29% by ISTH and 61% by JAAM)," the study authors note. "Since the criteria of the two scores are similar (both use platelet count, prothrombin time and fibrin/fibrinogen degradation products) but different (JAAM includes SIRS, ISTH includes fibrinogen), it is difficult to explore why these two criteria show such remarkable difference in the incidence rate of DIC."

The authors point out that thrombocytopenia in patients with severe sepsis is not only caused by DIC but also by various conditions. Many patients with severe thrombocytopenia and sepsis do not fulfil the criteria for overt DIC. Therefore, the authors say, thrombocytopenia not due to true DIC may distort the relation between the DIC score and prognosis.

The JAAM criteria include the SIRS (systemic inflammatory response syndrome) score. However, many studies have shown that the presence of SIRS is nearly ubiquitous in hospitalised patients and occurs in many benign conditions, and is not specific for inflammation. The new sepsis definition (SEPSIS 3) published recently no longer includes SIRS criteria.

"Our findings suggest that current DIC diagnosis criteria need further modification to meet the condition of displaying prognostic values. Recently several studies have suggested that new biomarkers might be useful for early assessment of sepsis-induced DIC. These new biomarkers may be important keys to revise DIC diagnostic criteria in future," the authors say.

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