Markers of collagen synthesis and degradation are increased in serum in severe sepsis

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Purpose

Sepsis-related multiple organ dysfunction is a common cause of death in intensive care units. The effect of sepsis on markers of tissue repair is only partly understood. In this study markers of collagen synthesis and degradation were measured during sepsis and the association to disease severity and outcome was investigated.

Patients and Methods

44 patients with sepsis participated in the study. Fifteen volunteers acted as controls. Blood samples were collected for 10 days following the first sepsis-induced organ dysfunction and after 3 and 6 months. Procollagen type I and III aminoterminal propeptides (PINP, PIIINP) as well as cross-linked telopeptides of type I collagen (ICTP) were measured.

Measurements and main results

PIIINP concentration was elevated in the septic patients (8.8 μg/L [25th–75th percentile 6.8–26.0]) compared with the controls (3.0 μg/L [25th–75th percentile, 2.7–3.3], P<0.001) on day one. Maximum serum PIIINP concentrations during sepsis were higher in non-survivors compared with survivors (26.1 μg/L [18.7–84.3] vs. 15.1 μg/L [9.6–25.5], P=0.033) and in multiple organ failure (MOF) compared with multiple organ dysfunction syndrome (MODS) (24.2 μg/L [13.4–48.2] vs. 8.9 μg/L [7.4–19.4], P=0.002). Although the PINP values of the septic patients remained within the laboratory reference values, the patients with MOF had higher values than patients with MODS (79.8 [44.1–150.0], vs. 40.4 [23.6–99.3], P =0.007). Day one ICTP levels were elevated in septic patients compared with the controls (19.4 μg/L [12.0–29.8] vs. 4.1 μg/L [3.4–5.0], P<0.001).

Conclusions

Markers of collagen metabolism are increased in patients with severe sepsis and may be used as markers of disease severity and outcome. ❐