Microparticles are new biomarkers of septic shock-induced disseminated intravascular coagulopathy

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Résumé en anglais	PURPOSE: Septic shock-induced disseminated intravascular coagulopathy (DIC) contributes to multiple organ failure. Mechanisms governing vascular responses to open occurrence of DIC have not yet been established. Circulating plasma microparticles (MPs), released upon cell stress, constitute a catalytic procoagulant surface and are surrogates of vascular cell activation/injury. Herein, MPs were assessed as possible markers of haemostatic and vascular dysfunction in the DIC time course. METHODS: One hundred patients with septic shock from three ICUs were enrolled and their haemostatic status evaluated at admission (D1), D2, D3 and D7. Circulating procoagulant MPs were isolated, quantified by prothrombinase assay and their cellular origin determined. DIC diagnosis was made according to the JAAM 2006 score. RESULTS: Ninety-two patients were analysed and 40 had DIC during the first 24 h. Routine clotting times and factor/inhibitor activity did not allow assessing vascular cell involvement. At admission, thrombin generation and fibrinolysis were observed in both groups while impaired fibrin polymerisation was evidenced only in DIC patients. Sustained thrombin generation persisted over time in both groups at D7. While total microparticle concentrations were in the same range regardless of DIC diagnosis, specific phenotypes were already detected at admission in DIC patients. Endothelial- and leucocyte-derived MPs were higher in DIC while an increased soluble glycoprotein V/platelet ratio was delayed, underscoring the first involvement of endothelial cells and leucocytes whereas platelet activation was delayed. Endothelium-derived CD105-MPs (OR 6.55) and CD31-MPs (OR 0.49) were strongly associated with early DIC in multivariate analysis. CONCLUSION: Endothelial-derived microparticles are relevant biomarkers of septic shock-induced DIC and could be used to evaluate early vascular injury.
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