

Endothelial Vascular Reactivity in Septic Patients: Systematic Review

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Introduction. Sepsis is characterised by hemodynamic alterations associated with organ dysfunction. Even in macrohemodynamically stable patients there are signs of microvascular perfusion abnormalities. Endothelium is thought to be the key organ involved in pathogenesis of these phenomena. Reactive hyperemia to ischemic or pharmacologic stimuli has been used as a test of endothelial nitric oxide bioavailability and dysfunction in conduit arteries and microvasculature. Several different stimuli and methods of measuring of resulting reactive hyperemia have been used with variable results.

Aim, Material and Methods. The aim of this study was to conduct a systematic review of the current published literature of conduit artery and microvascular dysfunction measured by provocation tests to determine their performance in predicting the severity of sepsis and clinical outcomes. A systematic search was conducted in MEDLINE and Scopus according to the PRISMA guidelines and restricted to English publications. Endothelial dysfunction was described as changes in endothelial vascular reactivity in relation to presence or severity of sepsis, development or severity of single or multiple organ failure and mortality.

Results. We found 363 possibly relevant articles in our search and of these 15 studies met our inclusion and exclusion criteria. 14 of them found blunted endothelium dependent vasodilatation in patients with sepsis compared with healthy volunteers. There were conflicting results regarding correlation between increasing severity of sepsis and degree of endothelial dysfunction. Endothelial function markers in early sepsis did not reliably predict mortality or clinical worsening, but subsequent improvement in repeated measurements was associated with clinical improvement. No correlation was found with biochemical markers of endothelial dysfunction.

Conclusions. Endothelial vascular reactivity is decreased in patients with sepsis, but the degree of dysfunction does not correlate with severity of sepsis or mortality.