

Cerebral hemodynamics

Cerebral hemodynamics is a complicated subject because many factors are interacting. For example, the blood flow in a specific brain region is influenced by: 1. [arterial pressure](#), 2. [intracranial pressure](#), 3. [hematocrit](#) (viscosity), 4. degree of eventual proximal stenosis, 5. calibers and extent of collateral channels and 6. action of the [cerebral autoregulation](#).

Cerebral [hemodynamics](#) and metabolism are frequently impaired in a wide range of neurological diseases, including traumatic brain injury and stroke, with several pathophysiological mechanisms of injury. The resultant uncoupling of cerebral blood flow and metabolism can trigger secondary brain lesions, particularly in early phases, consequently worsening the patient's outcome. Cerebral blood flow regulation is influenced by blood gas content, blood viscosity, body temperature, cardiac output, altitude, cerebrovascular autoregulation, and neurovascular coupling, mediated by chemical agents such as nitric oxide (NO), carbon monoxide (CO), eicosanoid products, oxygen-derived free radicals, endothelins, K⁺, H⁺, and adenosine. A better understanding of these factors is valuable for the management of neurocritical care patients. The assessment of both cerebral hemodynamics and metabolism in the acute phase of neurocritical care conditions may contribute to a more effective planning of therapeutic strategies for reducing secondary brain lesions ¹⁾.

¹⁾

Bor-Seng-Shu E, Kita WS, Figueiredo EG, Paiva WS, Fonoff ET, Teixeira MJ, Panerai RB. Cerebral hemodynamics: concepts of clinical importance. Arq Neuropsiquiatr. 2012 May;70(5):352-6. Review. PubMed PMID: 22618788.

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