Chronic Cerebrospinal Venous Insufficiency in Multiple Sclerosis: The Hydrostatic-Immune Paradigm and the Flow Cytometry as a Diagnostic Tool

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Abstract

In recent years, chronic cerebro-spinal venous insufficiency (CCSVI) has been associated with multiple sclerosi (MS). Balloon angioplasty of the affected veins (internal jugulars, azygos) has been proposed as a treatment method, with controversial results. The conflict is based on how a primarily immune disease can be affected by a primarily hydrostatic condition and its reversal. In our paper we briefly review novel paradigms in multiple sclerosis pathogenesis and propose a mechanism by which CCSVI could theoretically lead to blood brain barrier disruption, altered neuronal microenvironment, astrocyte and oligodendrocyte loss and demyelination. Altered antigen transfer to regional lymph nodes, affecting antigen presentation and processing could also contribute, affecting the sensitivebalance between tolerance and immunity. Thus, a combined hydrostatic-immune paradigm of MS emerges, which may explain the potential role of CCSVI in MS pathogenesis and provide a theoretical framework for future research.