

New biomarkers of multiple sclerosis pathogenesis

May 22 2017

Multiple sclerosis (MS) is a chronic debilitating inflammatory disease targeting the brain. The pathogenesis of MS remains largely unknown, though brain tissue damage in MS is likely due to immune cells attacking myelin basic protein (MBP), which composes the insulating sheath of nerve tissue. Most MS brain lesions are found near small veins, and have prominent immune cell infiltration, supporting the hypothesis that brain lesions are due to leukocyte damage to neurons. Clinical data as well as evidence collected using an animal model of MS suggest that leukocytes cross the blood-brain barrier (BBB) and localize in brain lesions. However, it is still unclear whether inflammation in the brain is initiated within the central nervous system or is the result of leukocyte migration across the BBB driven by systemic inflammation.

An international team led by Dr Svetlana Khaiboullina presented novel data on cytokine activation in serum and cerebrospinal fluid from multiple sclerosis (MS) patients. This data suggests a central role for interferon gamma (IFN γ) in MS-related brain inflammation. The authors propose that high serum IFN γ could activate astrocytes triggering production of a novel subset of chemokines, establishing an inflammatory milieu and promoting migration of autoreactive encephalitic T lymphocytes into the brain. The study was published in *Frontiers in Immunology*, 18 May 2017.

Collected data supports the hypothesis that a specific subset of cytokines activates, regulating Th1 and Th17-type immune response in MS. However, the most interesting finding was that the CSF and serum

cytokine profiles differ in MS. The authors found an increase in IFN γ and IL12(p40) levels in the [cerebrospinal fluid](#), suggesting upregulation of Th1 leukocytes in the brain, while a high level of IL17 was found in serum, indicating Th17 leukocytes activation in the circulation.

More information: Timur Khaibullin et al, Elevated Levels of Proinflammatory Cytokines in Cerebrospinal Fluid of Multiple Sclerosis Patients, *Frontiers in Immunology* (2017). [DOI: 10.3389/fimmu.2017.00531](#)

Provided by Kazan Federal University

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