Is neurodegeneration in ms always the consequence of inflammation or it is a separate pathogenetic mechanism?

J. Losy
Department of Clinical Neuroimmunology, University School of Medicine, Poland

Multiple sclerosis is a chronic autoimmune, inflammatory disease of the central nervous system,which leads to focal inflammatory demyelinated lesions with secondary neurodegeneration. Inflammation in multiple sclerosis appears as a crucial multi-step process beginning with peripheral immune reactions creating autoreactive T cells, transmigration of immune cells through blood-brain barrier, followed by demyelination, degeneration and axonal damage in the white and gray mater. Multiple molecular and cellular components mediate neuroinflammation in MS. They unclude CD4+ T cells, CD8+ T cells, B cells, microglia and macrophages. Infiltrating Th1 CD4+ T cells secrete proinflammatory cytokines,which stimulate the release of chemokines,expression af adhesion molecules and can be factors that can damage myelin sheath and axons. CD8+ T cells can directly damage axons. The mechanism of axonal damage is multifactorial and include also actions of proteases , microglia activation with free radicals released during CNS inflammation and oxidative injury ,mitochondrial damage as well as lack of neurotrophic factors provided to axons. A highly significant association between inflammation consisting of T cells, B cells, plasma cells and macrophages and axonal injury exists in MS patients including progressive forms of MS. The above association does not exclude the possibility that neurodegeneration may develop independently from inflammation. Active demyelination in the cortex is associated with microglia activation and related to meningeal inflammation. Some anti-inflammatory , immunomodulating drugs influence the course of MS, have influence on disability and decrease progression of brain atrophy.