

Development of Acute Transverse Myelitis following COVID-19 Infection: A Review on the Potential Pathways

Background: Acute transverse myelitis (ATM) is a rare neurological disorder in adults characterized by localized inflammation of gray and white matter in one or more contiguous spinal cord segments in the absence of a compressive injury. Several reports have connected the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) to the pathophysiology of ATM.

Summary: Direct invasion of the spinal cord, cytokine storm, or an autoimmune response are the possible pathways by which the SARS-CoV-2 virus can affect the spinal cord and lead to ATM. Direct invasion is facilitated by the presence of angiotensin converting enzyme 2 (ACE2) receptors on the membranes of the spinal cord neurons. Cytokine storm syndrome could be derived from elevated levels of several immunological factors following severe involvement with coronavirus disease 2019 (COVID-19). Finally, autoimmune responses can cause post-infectious ATM through several hypothesized processes, including molecular mimicry, epitope spreading, bystander activation, and polyclonal B-cell activation.

Key Messages: COVID-19-induced ATM is mostly a longitudinally extensive ATM (LEATM), in which more spinal cord segments are damaged, which results in a worse sequel compared to short-segment ATM. Therefore, it is suggested that COVID-19 patients, particularly severe cases, be followed up for a probable incidence of ATM, even long after recovery from the disease and elimination of the virus from the host, because an early diagnosis and effective therapy may stop the spread of inflammation to adjacent segments.