Title: **Investigation of the interleukin profile in the cerebrospinal fluid of minimal consciousness state patients after mesenchymal stem cell therapy**

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Abstract:

The state of minimal consciousness (MCS) is characterized by a severely impaired consciousness, with symptoms of wakefulness and partial preservation of awareness. It has been documented that the constant activation of glial cells responsible for the production and secretion of pro and anti-inflammatory factors contributes to the exacerbation of pathological changes in states preceding the occurrence of MCS. Although the prevalence of MCS is estimated at 100,000 to 300,000 adults and children, there is no effective treatment for MCS. One of the promising therapeutic approaches appears to be mesenchymal stem cell (MSC) therapy, mainly due to immunoregulatory properties of MSC.

The aim of the study was (i) to investigate the profile of interleukins (ILs) in the cerebrospinal fluid (CSF) of patients with MCS and (ii) to determine the potential impact of MSC therapy on the level of ILs expression. Nine patients aged 19–45 years, remaining in MCS for3–14 months, were included in BM-MSC therapy and received three autologous MSC administrations. CSF was collected before transplantation (control) and after the first and second administration of MSC. The concentration of 26 selected ILs was measured semi-quantitatively by dot-blotting.

Our results confirmed the presence of IL8, IL19, IL23, IL24, IL32, IL33 in the CSF of examined MCS patients. Administration of BM-MSC resulted in the decrease of IL18, IL19, IL23, IL33 levels and increase of IL24 level, compared to the content before transplantation of BM-MSC. Expression of IL8 and IL32 was constant during therapy. The above results indicate the immunomodulatory effect of MSC therapy on the inflammatory process in MCS, possibly through the paracrine action of MSCs.