A Pilot Cross-Sectional Study to Investigate the Biomarker Potential of Phosphorylated Neurofilament-H and Immune Mediators of Disability in Patients With 5 Year Relapsing-Remitting Multiple Sclerosis

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Objective: To test the feasibility of conducting a full-scale project evaluating the potential value of the phosphorylated neurofilament H (pNF-H) and several cytokines as disability markers in relapsing-remitting multiple sclerosis (RRMS). Methods: Twenty-four patients with 5-year RRMS evolution and eleven healthy control subjects entered the study. None of the participants had an inflammatory systemic or metabolic disease. Disability progression was evaluated using the Expanded Disability Status Scale. Serum level of pNF-H, the anti-inflammatory cytokine transforming growth factor-? 1 (TGF-?1), and the pro-inflammatory cytokines tumor necrosis factor-? (TNF-?), interleukin-1? (IL-1?), interleukin-6 (IL-6), interleukin-8 (IL-8), interleukin-17A (IL-17A), monocyte chemotactic protein-1 (MCP-1), and soluble intercellular cell-adhesion molecule 1 (sICAM-1) were quantified using enzyme-linked immunosorbent assay (ELISA). Results: The patients had higher serum level of TGF-?1, IL-6, sICAM-1, and pNF-H. Based on these findings, a sample of at least 49 controls and 89 recent-onset RRMS patients is required to find an at least 1-point between-group difference in pNF-H with a power of 80% and an ? error = 0.05. The progression of the disease was correlated with the level of pNF-H (Spearman rho = 0.624, p = 0.006), but not with the cytokines'. Conclusions: The serum level of pNF-H, EDSS score-correlated,

might stand for a potential biomarker of disability in RRMS reflecting progressive axonal damage and cumulative neurological deterioration. The novelty of these results warrants conducting a larger confirmatory trial.

biomarker potential

cytokines

disability progression

expanded disability status scale

neurofilament heavy chain phosphoform

relapsing-remitting multiple sclerosis

cytokine

intercellular adhesion molecule 1

interleukin 17

interleukin 1beta

interleukin 6

interleukin 8

monocyte chemotactic protein 1

neurofilament H protein

neurofilament protein

transforming growth factor beta1

tumor necrosis factor

unclassified drug

adult

Article

axonal injury

case study

clinical article

clinical evaluation

controlled study

correlational study

cross-sectional study

deterioration

disease exacerbation

disease marker

enzyme linked immunosorbent assay

Expanded Disability Status Scale

feasibility study

female

human

immunomodulation

male

metabolic disorder

multiple sclerosis

observational study

pilot study

protein blood level

protein phosphorylation

scoring system