

# Serum Phosphorylated Neurofilament Heavy Chain Level in Relapsing Remitting Multiple Sclerosis in Correlation to Disease Activity and Disability

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Multiple sclerosis (MS) is a disease of clinical diagnosis. There is no single specific diagnostic test available, no single clinical feature is sufficient to diagnose MS. Hence the necessity to research the presence of new diagnostic, prognostic markers and markers of activity of the disease. As principal components of the axonal cytoskeleton, Neurofilaments (NFs) are released in the interstitial fluid after axonal injury or degeneration. NFs was detected in the serum or cerebrospinal fluid (CSF) allowing their potential use as biomarkers of neurodegeneration as well as disease activity, progression and to directly assess the efficacy of current and emerging therapies for reducing axonal injury and the likely pathological substrate of progressive neurological decline. Serum biomarker of axonal injury could prove useful as a prognostic or monitoring tool. We aimed to study the relationship between serum Phosphorylated Neurofilament Heavy Chain (pNF-H) level and clinical activity of relapsing-remitting MS (RRMS) and disability measured by EDSS score. The study included 60 patients suffering from RRMS diagnosed according to *McDonald's criteria* 2010 and 30 healthy controls. After verbal consent, all were subjected to detailed medical history, clinical examination using EDSS score and measurement of serum pNF-H by quantitative ELISA. Results demonstrated a significantly higher serum levels of pNF-H in MS patients than healthy controls; pNF-H was  $5.02\pm 3.25$  in cases and  $0.65\pm 0.2$  in controls ( $P<0.05$ ), with a calculated sensitivity and specificity of 95% and 100%, respectively, and a positive and negative predictive values of 100% and 90.9%, respectively, at a cut-off level of 1.1ng/dl. Additionally, levels of pNF-H were significantly higher among relapsing than remission groups, with 93.33% and 83.33% calculated sensitivity and specificity, respectively, and a positive and negative predictive values of 84.8 % and 92.6 %, respectively, (at that cut-off level 4 ng/dl). In conclusion, pNF-H is a promising marker of MS disease activity and disability assessment.