# KAPPA FREE LIGHT CHAIN CONCENTRATIONS CORRELATE WITH BRAIN ATROPHY IN MULTIPLY SCLEROSIS.

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**Introduction.** Brain atrophy is caused by axonal damage and demyelination in a clinical course of multiple sclerosis (MS) and correlate with progression with MS Several studies indicate that production of CSF immunoglobulin free light chains kappa (k-FLC) in MS is also associated with the disease progression. No studies so far report is FLC production in the CSF correlate with brain atrophy.
**Aim.** The aim of this study was to assess the correlation between FLC and atrophy.
**Materials and methods.** FLC-concentrations were measured using a novel ELISA assay (Polignost Ltd., St. Petersburg, Russia) based on monoclonal anti-k antibodies directed against cryptic epitopes of FLC molecules. FLC quotient (Q-k) was calculated as a ratio of concentrations in the CSF to serum concentrations to correct for possible BBB penetrance. Brain atrophy was assessed using fully automated technique called SIENAX (Structural Image Evaluation, Using Normalization, of Atrophy Cross-sectional). Spearman's test was performed to assess correlations.
**Results.** 65 patients (male (n=22), female (n=43)) with MS were included into this study (RRMS (n=57), SPMS (n=2) and PPMS (n=6)). The median (IQR) age and disease duration were as follows: 33 (12) years, 17 (42) months, respectively. The concentrations of k-FLC in the CSF, Q-k showed significant inversed correlation with normalized brain volume (k-FLC: $r = -0.2613$, $p = 0.0355$; Q-k: $r = -0.3456$, $p = 0.013$) and with normalized gray matter volume (k-FLC: $r = -0.2858$, $p = 0.021$; Q-k: $r = -0.3367$, $p = 0.0157$).
**Conclusion.** The results of the study show the correlation between concentrations of k-FLC in CSF and brain atrophy. K-FLC could be a possible prognostic biomarker for neurodegeneration.