

## **Abstract**

This thesis focuses on the role of anti-cytoskeletal antibodies in various neurodegenerative diseases. Autoantibodies against different axonal cytoskeletal proteins, such as the light (NF-L) and medium (NF-M) subunits of neurofilament and tubulin (TU), in serum and cerebrospinal fluid may be generated in response to the release of cytoskeleton from damaged neurons.

The aim of this study was to assess autoimmune involvement in amyotrophic lateral sclerosis (ALS) as well as to evaluate antibody light and medium neurofilament subunit in serum and cerebrospinal fluid (CSF) of patients with ALS. Furthermore, we were interested in the relationships among these antibodies in the serum and in the CSF as well as between the two anti-NF antibody subtypes. Secondly, the aim was to compare the levels of anti-tubulin antibodies (anti-TU) in cerebrospinal fluid and serum in multiple sclerosis (MS) disease, using bovine tubulin as the antigen in one enzyme-linked immunosorbent assay (ELISA) method (anti-Tub antibodies) and a synthetic neuron-specific octapeptide of tubulin in a second ELISA method (anti-TUs antibodies).

In the observed groups of ALS patients, serum levels of anti-NF-L antibodies were higher in ALS patients than in controls and serum anti-NF-L antibodies and intrathecal anti-NF-M antibodies were related to patient disability. Positive correlation was found between anti-NF-L levels and anti-NF-M levels in ALS patients and the controls in the CSF.

Levels of CSF anti-TUs and anti-TUb antibodies were significantly higher in MS patients compared to the normal control group. The intrathecal synthesis of anti-TUs antibodies was higher compared to anti-TUb in all groups. Positive correlation was found between anti-TUb and anti-TUs antibodies in the CSF of all examined groups.

Our results point to opportunities anti-cytoskeletal antibodies as using marker of axonal damage.

**Key words:** multiple sclerosis; amyotrophic lateral sclerosis; anti-cytoskeletal antibodies; neurofilament; tubulin; ELISA method