

## **Abstract:**

Introduction: The aim of our study was to assess the effect of dynamic changes in spinal flexion and extension assessed by dynamic magnetic resonance imaging (dMRI) on spinal cord functions assessed by dynamic evoked potentials (dEPs) in group of healthy individuals (group 1) and in group of patients with a small graphical pathology on cervical spine MRI in the neutral position, but with mild objective and progressive subjective difficulties (group 2).

Methodology: 10 healthy individuals and 10 patients were included in the study. Examination of dMRI as well as dEPs was performed in neutral position, flexion and extension. The anterior (PD) and posterior spinal cord length (ZD), transverse (PR) and anteroposterior dimension (PZ) and spinal cord area (P) were measured on the cervical spine MRI. The median and tibial nerves SEPs (somatosensory evoked potentials) and BB, APB and TA muscles MEPs (motor evoked potentials) were performed as well.

Results: In a group of patients we noticed a changes in the length and shape of the spinal cord but also spinal cord functions, already in the neutral position, even though there was no significant spinal cord compression. There were as well as healthy individuals elongation or shortening of PD and ZD during flexion and extension, There were, in contrast to healthy individuals, a reduction in PR, PZ and P in all segments during flexion and extension. At the same time, there were an alteration of spinal cord functions for the upper and lower limbs evaluated with the help of SEPs and MEPs.

Conclusion: Although the graphical examination shows a change in the shape and length of the spinal cord depending on the change in the axis of the cervical spine, it has no significant effect on the spinal cord function in healthy individuals. In individuals with a small objective neurological findings and small degenerative changes in the cervical spine, which in the neutral position do not lead to spinal cord compression, dynamic examination shows pressure on the spinal cord, leading to spinal cord function changes. Examination with these dynamic methods is therefore beneficial for decision making on the diagnosis of patients.