

This dissertation is providing evidence that rehabilitation with biofeedback improves postural stability in patients with poor balance. We used two methods of biofeedback during the rehabilitation of the patient groups, visual control and electrotactile stimulation of the tongue. The thesis is based on the body of five scientific publications. The introduction is explaining how postural stability is controlled and how this is assessed by posturographic examination. Discussed also is neurorehabilitation using biofeedback, in patients with poor balance. Throughout the first experiment, we studied the effect of rehabilitation using visual feedback in patients during the early postoperative period after resection of vestibular schwannoma. The results showed stability adaptation is accelerated, using visual biofeedback in patients who have early postoperative rehabilitation, when compared to patients who did not use biofeedback during the postoperative rehabilitation. In the second experiment, we focused on assessing the subjective visual vertical in patients with defined postural deformity - idiopathic scoliosis. Our results showed that patients with idiopathic scoliosis (IS) have an abnormal perception of subjective visual vertical when compared to age matched healthy individuals. This finding supports the hypothesis that patients with IS may have an asymmetric function of the vestibular system.

Also attached are two publications which describe the use of the electrotactile stimulation and posturographic examination in clinical practice.

In the third experiment, we evaluated the effect of rehabilitation with electrotactile stimulation on patients with cerebellar ataxia. The results of our experiment showed that rehabilitation using the electrotactile stimulation of the tongue is an appropriate rehabilitation for patients with degenerative cerebellar diseases.