Abstract

The theoretical part of the thesis deals with stroke from the medical and physiotherapeutic point of view with respect to movement deficit of the paretic upper limb. Specifically, the diagnosis of the disease, therapy and incidence including risk factors are mentioned.

The practical part deals with 7 case reports of patients who underwent rehabilitation using virtual reality 2-3 times a week over the course of 8 weeks. The aim of these case studies is to determine the influence and evaluate the effectiveness of virtual reality therapy on functional deficit of the upper limb in different patients after stroke. The purpose is also to monitor practical aspects of therapy of specific patients after stroke, which will be taken into account in cooperation with the developers for future improvement of rehabilitation systems using VR.

The Frenchay arm test, the modified Frenchay scale and the Visual Assessment Score of the Hand Functional Task are used to objectify the function of the upper limb. The evaluation is complemented by the quality of life questionnaires EQ-5D-3L and Short Form-36. The measurement further evaluates the momentum of the paretic upper limb, in particular the joint extent and the rate of spasticity using the modified Ashworth scale. All examinations are performed both at the initial examination and at the final examination after the end of a series of therapies. The developed case reports also include the described course of therapy with practical and technical aspects.

Although the work is based on the description of individual case studies, a summary statistical evaluation of the primary endpoints was also performed, namely the modified Frenchay scale and the Visual Assessment Score of the Hand Functional Task.

The mean entry point score of the modified Frenchay scale was 63.2±12.9 points, the output score was 73.3±12.1 points out of 100 points. Each patient scored an average of 10.2±3.9 points. The mean entry point score The visual evaluation score of the hand function task was 10.7±5 points, the output score was 13.6±5.4 out of a possible 20. The mean improvement was 2.9±1.6 points.

The statistical analysis of the data obtained confirms a significant improvement in the modified Frenchay scale testing both statistically (p=0.002) and factually (Cohen d=0.81). The same is true for the Visual Evaluation Score of the hand function task, where there was a statistically (p=0.004) and significantly factually (Cohen d=0.77) significant difference in the entry and exit examination. According to the Kolmogorov-Smirn test, the data meet the normal distribution.

Keywords