

## **Abstract**

**Title:** Effect of neurotraining on post-concussion syndrome in a football player – a case report

**Aims:** The aim of this study is to analyse the effectiveness of neurotraining for alleviating the symptoms of post-concussion syndrome using a case study of an adult football player after concussion.

**Methods:** The case-control study used the test, re-test technique. The standardized SCAT5 questionnaire, neuroimaging system testing using optotype, prismatic flipper 6/12, Neurotracker, RightEye and Senaptec Sensory Station were used to assess changes in the effectiveness of the method. Stability measurements were performed using the Physics Toolbox Sensor Suite and, for cognitive function, the Stroop effect. Next, a neurodiagnostic was performed, based on which the proband was selected to perform neurotraining exercises for two months (visual system and mechanoreception were tested).

**Results:** The proband improved in visual acuity by 20 %, vergence flexibility by 44 %, neurocognitive function by 44 %, reaction time by 29 %, depth of field binocularly by 12 %, visualization by 6 % and improved on the neurotracker by 0.3. There was a slight deterioration in left eye accommodation and binocularity by 5 %, depth of field in the right eye by 1 %, in the left eye by 4 %, and in the transition of focus from long distance to short distance by 16 %. Improvement was evident in measures of stability in standing with eyes closed and stability on both the right and the left leg with eyes open. The proband also improved in the Stroop test by a total of 30 points when all three trials were added together and his symptoms of post-ictal syndrome such as headache, cervical spine pain, difficulty concentrating and falling asleep also improved.

**Keywords:** Neuro-athletic training, concussion, brain, neuro-visual training, proprioception, vestibular system