Title: Hyperactive behavior of athletes with post-concussion symptoms

Authors:
Ingo Helmich, Department of Neurology, Psychosomatic Medicine and Psychiatry, Institute of Health Promotion and Clinical Movement Science, German Sport University (GSU) Cologne, Germany

Hedda Lausberg, Department of Neurology, Psychosomatic Medicine and Psychiatry, Institute of Health Promotion and Clinical Movement Science, German Sport University (GSU) Cologne, Germany

Funding:
The study was funded by the University research funding of the German Sports University, Cologne (L-11-10011-175-122000).

Abstract:
Introduction: Observations of hyperactive (restless, agitated) behavior as a consequence of sport related concussions (SRC) are inconclusive as hypoactivity has also commonly been described. This might be grounded in the fact that the movement behavior of athletes has not been systematically investigated during standardized settings and with objective methods of movement analysis. Thus, we investigated the contradiction whether symptoms after SRC are characterized by a hyper- or hypoactive movement behavior experimentally. Methods: Three matched groups were investigated: 14 symptomatic and 14 asymptomatic athletes with a concussion; and 12 non-concussed athletes. Four certified raters analyzed the NEUROGES the Activation and Contact incl. Rest/Pose categories as reliable measures of hypo/hyperactivity of (hand) body movement activity that were displayed during a videotaped standardized anamnesis protocol. Results: Symptomatic athletes spend significantly more time with act apart hand movements and less time with closed rest positions when compared to non-concussed athletes. Post-concussion symptom (PCS) scores positively correlate with act apart hand movements. A linear regression analysis revealed that act apart hand movements significantly predict the PCS score. Discussion: In line with previous descriptions of hyperactivity after SRC, athletes with increased symptoms after mTBI in sports behave hyperactive and restless when analyzed systematically. Because agitated/restless behavior was previously described in the concussed athletes who were later diagnosed with chronic traumatic encephalopathy (CTE), we suggest that future diagnoses should concern the detailed analysis of the movement activity as a potential behavioral marker of sport related concussions.

References: