

GCRI INTERVIEW

Dr. med. Inga Katharina Koerte, M.D.

**Radiology Resident, Senior Research Fellow, University Hospital Munich,
Ludwig-Maximilians-Universität München**

To what extent do sports-related head injuries affect a person's memory?

There is evidence that sports-related concussions may lead to chronic neurobehavioral impairment, such as impaired memory, reduced attention span, and impaired concentration.

Is there a gender-specific difference when it comes to Traumatic Brain Injuries (TBI)? Are the female skull and brain more prone to head injuries? If so, why?

Female players of certain contact-sports, such as soccer, are indeed more likely to suffer from sports-related concussions. To date, there is conflicting data as to whether being female is a risk factor for more post-concussive and chronic symptoms.

Could sports-related mild traumatic head injuries lead to the development of memory loss, aggression, confusion and depression later in life? If so, could you please explain how this occurs?

Most people who suffer from a concussion will recover completely. However, about 30% of patients will develop some kind of chronic neurobehavioral impairment, e.g. impaired memory, reduced attention span, and impaired concentration. The mechanisms that lead to these symptoms are not fully understood.

A small number of patients may develop a progressive neurodegenerative disease which is called chronic traumatic encephalopathy, or CTE. CTE is caused by a degeneration of brain tissue due to the accumulation of tau protein.

When do you expect the implications of sub-concussions, like decreased attention span, visual processing, lessened ability of complex thought processes and memory, become symptomatic?

To my knowledge, there is no study out there that actually studied the long-term neurocognitive effects of only sub-concussive blows to the head. Most studies included subjects with a combination of sub-concussive and concussive head trauma. Besides the acute symptomatology following a concussion, a player may develop chronic post-concussive symptoms even years later.

What do you consider possible implications of your research and which aspects of this subject matter should, in your opinion, be further investigated?

We found that soccer players who had not suffered from a clinically diagnosed concussion showed changes in white matter in the brain compared with professional swimmers. These changes are consistent with the kind of changes reported in mild traumatic brain injury.

We think this is an important message for all soccer players, so that they may be aware of the changes we have observed. While we do not yet know what these changes mean, soccer players should be aware that they may be putting themselves at some risk for developing brain injuries.