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Kickboxing causes damage to hormone producing area in brain

New research shows for the first time that kickboxing can cause brain damage. Head injuries in kickboxing can cause damage to an area of the brain called the pituitary, resulting in decreased production of hormones, which affect the body's metabolism and response to stress. Research published in the March edition of *Clinical Endocrinology* suggests that amateur kickboxers who have suffered head injuries should be screened to ensure their pituitary is producing enough hormones.

The pituitary is a pea-sized gland, weighing one gram or less, which is found in the brain. It produces many hormones that are involved in the body's regulation of metabolism, coping with daily stress, general wellbeing and sex drive amongst other areas. A team led by Prof. Fahrettin Kelestimur at Erciyes University Medical School in Turkey measured the levels of these hormones in 22 amateur kickboxers and compared these to sex-matched healthy controls. They found that kickboxers (27.3%) suffered more than controls from hypopituitarism, a condition where the pituitary does not produce enough hormones.

Kickboxing is one of the most popular martial arts, enjoyed by approximately one million people around the world. The head is one of the most common sites of injury for both amateur and professional kickboxers. Further studies are now needed to better understand the mechanisms of hypopituitarism in head trauma patients and to develop more effective head protection gear for kickboxers.

Researcher Prof. Kelestimur said:

“This is the first time that amateur kickboxing has been shown to cause damage to the pituitary, resulting in insufficient hormone production. Our study shows that kickboxers experience an increased risk of suffering from hypopituitarism, a condition where the pituitary fails to produce enough hormones. In healthy people, hormones produced by the pituitary fulfil a critical role in helping the body maintain a healthy metabolism and cope with daily stress.

Extrapolating from our results, potentially a quarter of a million people worldwide could be producing decreased amounts of hormones as a direct result of head injuries sustained during kickboxing. We recommend that people who take part in combative sports, like boxing or kickboxing, and are exposed to repeated head trauma should be screened to ensure their pituitary is working properly.”

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Notes for editors:

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ABSTRACT

Kickboxing sport as a new cause of traumatic brain injury-mediated hypopituitarism

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Objective Traumatic brain injury, which is a frequent and a worldwide important public health problem, may result in pituitary dysfunction. Concussion, a common type of lesion after traumatic brain injury, is an injury associated with sports including boxing and kickboxing. Kickboxing is one of the most popular martial arts and approximately 1-million people around the world participate in kickboxing sport. Head is the most common site of injury in amateur and professional kickboxers. Pituitary consequences of chronic repetitive head trauma in kickboxing have not been investigated until now. Therefore, the present study was designed to investigate the pituitary function in both retired and active amateur kickboxers.

Patients and Design Twenty-two amateur kickboxers who have boxed in national and international championships (16 men, 6 women) with a mean age of 27.3 ± 7.1 years, and 22 age- and sex-matched healthy controls were included in the study. Basal hormone levels were obtained from the participants. To assess GH-IGF-I axis, GHRH + GHRP-6 test and glucagon stimulation tests were used. Hypothalamo-pituitary-adrenal axis was assessed by glucagon stimulation test.

Results When mean basal hormone levels were compared between kickboxers and the controls, IGF-I level was significantly lower in kickboxers ($P < 0.05$). Five (22.7%) and two (9.1%) of the 22 kickboxers had GH deficiency had ACTH deficiency, respectively. There were significant negative correlations between IGF-I levels and age, duration of sports and number of bouts ($P < 0.05$).

Conclusions Present data clearly demonstrate for the first time that amateur kickboxing is a novel cause of hypopituitarism and kickboxers are at a risk for

hypopituitarism especially isolated GH deficiency. Therefore, participants of the combative sports who were exposed to chronic repetitive head trauma need to be screened