

Could better eye training help reduce concussion in women's soccer?

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In a study from the University of Cincinnati, a photo analysis of soccer headers found that 90 percent of females close their eyes when heading the ball, Credit: University of Cincinnati Athletics

With the ever-growing popularity of women's soccer, attention to sports-related concussions is also a growing concern, as the act of heading the ball is thought to contribute to increased incidence of concussion.

"Current evidence shows that high school female [soccer players](#) incur a higher concussion rate than males," says Joe Clark, PhD, professor in the Department of Neurology and Rehabilitation Medicine at the University of Cincinnati College of Medicine. "While this is often attributed to gender differences in physical build or neck muscle strength, our study suggested that there might be other behaviors such as field awareness that are contributing factors that result in these higher concussion rates."

Researchers working with Clark observed that in photographs of female soccer players during play, the players often had their eyes closed while heading the ball. They wanted to quantify whether female athletes closed their eyes more frequently than male counterparts, as a first step toward determining if less visual awareness might expose players to a higher risk of injury. Their results of the first part of this study have been published in the online version of *Medical Hypotheses*.

Through an analysis of Google images of soccer headers by both male and female players in active game play, 100 images of each gender were reviewed and categorized. Some images showed more than one athlete participating in the header, what some people may call a 50-50 ball.

Of 170 females identified in the photos, 90.6 percent of them were shown to have their eyes closed during play. By comparison, 79 percent of male players had their eyes closed, of the 170 male athletes evaluated in the photos.

These findings indicated that female players were more likely to close their eyes at the act of heading the ball, versus males. Vision training methods in other concussion-prone sports like football work to train the athletes to use visual tactics to be aware of the ball and aware of other players prior to a hit something the researchers refer to as "eye discipline."

It is felt that better eye discipline may account for the difference in concussion rates between males and females. "In other studies, [vision training](#) has successfully reduced the rates of concussion in college football athletes; overall lack of [visual awareness](#) in a contact sport may increase the risks of concussion. Therefore vision training and better eye discipline may decrease concussion rates."

Clark, who works with high school and college-level athletes on vision training techniques to improve their awareness in avoiding hits on the field, says that with practice, athletes can learn to play safer. "The startle reflex, or blinking or closing one's eyes upon a perceived risk, can be suppressed through training and coaching. So it is possible that training to improve eye discipline and maintain control of ball handling, may help mitigate concussions in soccer [players](#) heading the ball," he says.

Hagar Elgendy, a medical student at the UC College of Medicine, and a co-author of the study, has been involved with the sports medicine research at UC for the past few years. "Concussion in sport has gained much attention recently. It was exciting and interesting to be involved in this project and to propose a hypothesis for the greater concussion incidence in the [high school](#) athletic setting for females over males." Elgendy, along with her sister, Hanna Elgendy, worked to obtain and analyze the Google images for the study.

Clark says, "We hope to follow up with larger future studies as to whether eyes closed upon impact correlate with higher rates of [concussion](#), to validate this hypothesis."

More information: Joseph F. Clark et al, Lack of eye discipline during headers in high school girls soccer: A possible mechanism for increased concussion rates, *Medical Hypotheses* (2017). [DOI: 10.1016/j.mehy.2016.12.016](#)

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