Helmet add-ons may not lower concussion risk in athletes

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Football helmet add-ons such as outer soft-shell layers, spray treatments, helmet pads and fiber sheets may not significantly help lower the risk of concussions in athletes, according to a study released today that will be presented at the American Academy of Neurology's 67th Annual Meeting in Washington, DC, April 18 to 25, 2015.

"Our study suggests that despite many products targeted at reducing concussions in players, there is no magic concussion prevention product on the market at this time," said study author John Lloyd, PhD, of BRAINS, Inc. in San Antonio, Fla., and a member of the American Academy of Neurology.

Researchers modified the standard drop test system, approved by the National Operating Committee on Standards for Athletic Equipment, by using a crash test dummy head and neck to more realistically simulate head impact. Sensors were placed in the dummy's head to measure linear and angular rotational responses to helmet impacts at 10, 12 and 14 miles per hour.

Using this device, BRAINS researchers evaluated four football helmet add-ons: Guardian Cap, UnEqual Technologies' Concussion Reduction Technology, Shockstrips and Helmet Glide. Riddell Revolution Speed and Xenith X1 football helmets were outfitted with each of these add-ons and impacted five times from drop heights of 1.0, 1.5 and 2.0 meters. Linear acceleration, angular velocity and angular accelerations of the head were measured in response to impacts.

The study found that compared to helmets without the add-ons, those fitted with the Guardian Cap, Concussion Reduction Technology and Shockstrips reduced linear accelerations by about 11 percent, but only reduced angular accelerations by 2 percent, while Helmet Glide was shown to have no effect.

"These findings are important because angular accelerations are believed to be the major biomechanical forces involved in concussion," said Lloyd. "Few add-on products have undergone even basic biomechanical evaluation. Hopefully, our research will lead to more rigorous testing of helmets and add-ons."

Provided by American Academy of Neurology