

Comparative Analysis of Impact Attenuation Properties from Soccer Headgear

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ABSTRACT

Athletes suffering from long-term neurocognitive deficiency due to subconcussive impacts is a major concern for football and soccer players today. Football players wear helmets that can help reduce injury risks like skull fractures, and these helmets must meet standard criteria that determines how well a functional helmet should reduce accelerations of the player's head. Currently no standard exists for testing soccer headgear despite studies demonstrating soccer players experience similar magnitudes of impacts. In this study, a modal impact hammer was used in conjunction with a Hybrid III 50th percentile test dummy head to simulate impacts experienced by soccer players to quantify the effectiveness of headgear in attenuating head acceleration due to direct impacts. The study found one device to be functional, and able to reduce the translational acceleration for an average hit experienced by a soccer player by 20%. Devices need to be developed and common testing standards need to be established to allow for a more widespread implementation of similar devices to protect players from short and long-term injuries due to impacts.

KEYWORDS

Protective equipment, Soccer, Head Impacts, Helmet Evaluation, Dimensional Analysis