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A Head Start on Concussions

By DANIEL AKST

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Athletes who get concussions need to be kept out of action to prevent further damage, but the injury is often difficult to diagnose.

Symptoms such as headache and confusion can be misjudged by coaches or played down by athletes eager to remain in the game. What's needed is a more objective test of whether or not a concussion has occurred.



Brian Stauffer

Scientists at the University of Rochester in upstate New York and colleagues in Germany have taken a step in that direction by developing a blood test that appears to reliably correlate with sports-related concussion. The scientists report that a brain protein called S100B soars in the immediate aftermath of a concussion, enough so that a finger-prick test administered on the sidelines could help make on-the-field diagnosis much more reliable.

The scientists took baseline S100B measurements from 46 players of contact sports in Rochester and Munich and then, within three hours of injury, tested 17 who appeared to have concussions based on symptomatic diagnosis. They found that an increase of at least 46% in S100B above baseline levels was a reliable indicator of concussion.

Although used in Europe to assess the risk of intracranial bleeding or the need for a CT scan of the head, S100B testing lacks U.S. Food and Drug Administration approval, and the equipment is unwieldy. But companies are developing easy-to-use S100B finger-prick tests, potentially enabling coaches and trainers to deploy them in the field or arena. Athletes could have preseason tests to establish a baseline, just as many now take preseason cognitive tests to establish a baseline for symptomatic diagnosis of head injury.

Jeffrey Bazarian, one of the researchers, says between 1.6 million and 3.8 million U.S. sports concussions are diagnosed annually, but that the true number is probably twice that. A simple sideline biomarker test could make it harder to hide or overlook these—and easier get athletes with head injuries out of the game.

"Subject-Specific Increases in Serum S-100B Distinguish Sports-Related Concussion from Sports-Related Exertion," Karin Kiechle, Jeffrey J. Bazarian and eight other authors, PLOS One (Jan. 8)

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