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Biomarkers linked to sports-related concussion recovery

Bethesda, Md. – Certain blood-based biomarkers may inform clinicians and athletes how long their recovery time may be after sustaining a sports-related concussion, according to a new study published in JAMA.

The results of a multi-institution study supported by the Department of Defense (DoD), the National Collegiate Athletic Association (NCAA), and the National Institutes of Health (NIH), show promising results in improving our diagnostic capabilities and treating individuals with concussion (brain injury).

Made possible by the NCAA-DoD Concussion Assessment, Research and Education (CARE) Consortium, research teams at six CARE Consortium Advanced Research Core (ARC) sites, including West Point and the U.S. Air Force Academy, collected blood specimens and symptom recovery scores of 127 male (n=97) and female (n=30) student-athletes both before and after concussion. All samples were carefully processed, catalogued and shipped to the National Institute of Nursing Research at the NIH, where Dr. Jessica Gill and her team at NIH and the Center for Neuroscience & Regenerative Medicine (CNRM) at the Uniformed Services University (USU) performed sophisticated analyses, revealing that higher concentrations of tau protein along with lower glial fibrillary acid protein (GFAP) is likely associated with longer recovery after sports-related concussion.

Dr. Paul Pasquina, one of the study Principal Investigators, and chair of Physical Medicine and Rehabilitation at USU, said that it is estimated that over 20,000 service members sustain a traumatic brain injury (TBI) each year, with many suffering from the short- and long-term effects of sports-related and blast-related concussion. Therefore, this is of high priority to both the DoD and the NCAA.

“We are proud to be part of such great team science,” Pasquina said. “It is extremely rewarding to be part of this outstanding group effort to try and better understand one of the most common injuries impacting the health of our military service members and student-athletes across the United States.”

Blood-based biomarkers not only give researchers further insight into the pathophysiology of brain injury, but may also soon help clinicians better educate their patients, coaches, or military leaders how long it may take for them to safely return to sports or military duty, he said.

This study is also the largest study of collegiate athletes and military cadets, and it highlights the power of collaborations to address this critical issue, as understanding the impact of concussions on the health and well-being is essential, Gill said.

“This study expands our previous findings in a far larger cohort, showing that higher concentrations of tau in the blood within a day of a concussion predicts a longer recovery period,” she said.

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