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New blood test by Australian scientists tracks brain recovery after concussion

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A blood test can accurately detect the ongoing effects of sport-related concussion and help determine when it's safe to return to the field, Australia's Monash University-led research has found.

Researchers measured two brain-specific proteins in the blood of 81 Victorian Amateur Football Association (VAFA) players who experienced concussion and compared them with 56 players who did not.

By tracking levels of the blood biomarkers over time, they monitored how long it took the players' brains to recover, otherwise known as 'neurobiological recovery', to help determine when it may be safe to return to play without elevated injury risk. Until now, there have been no well-established tools for tracking neurobiological recovery after sport-related concussion.

This cohort study delved into the dynamics of two brain cell proteins, glial fibrillary acidic protein (GFAP) and neurofilament light (NfL), which are released into the blood following brain trauma. While the team's previous research demonstrated diagnostic potential of these blood biomarkers, this study aimed to reveal how their levels changed over time in concussed players.

The most striking finding was the variability in biomarker changes among individuals, with over 20 per cent of concussion cases showing substantial and persistent increases in both GFAP and NfL that remained elevated compared to non-concussed footballers for over four weeks.

Individuals with these extreme biomarker changes were substantially more likely to have lost consciousness as a result of their head knock.

Study lead and Monash Trauma Group Principal Investigator Dr Stuart McDonald, from the Monash University School of Translational Medicine, said while his team and others had investigated these biomarkers before, it was the first time a thorough profile of post-injury progress had been recorded.