Do brain activation changes persist in athletes with a history of multiple concussions who are asymptomatic?

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Source

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Abstract

PRIMARY OBJECTIVE:

To evaluate brain activation patterns of asymptomatic athletes with a history of two or more concussions.

RESEARCH DESIGN:

A paired case-control design was used to evaluate brain activation patterns during cognitive performance in 14 athletes with a history of two or more concussions and 14 age- and sex-matched controls with no previous concussion.

METHODS AND PROCEDURES:

Percentage Blood-Oxygen-Level-Dependent (BOLD) change during an N-back working memory task was assessed in all participants. Performance on the Trail-Making Test Form A and B, Symbol-Digit Modalities Test and the Immediate Post-concussion Assessment and Cognitive Test (ImPACT) was also compared between groups.

MAIN RESULTS:

As expected, brain regions activated during the performance of the N-back were equivalent between groups. The groups performed similarly on the neurocognitive measures. The history of concussion group was less accurate than controls on the 1-, 2- and 3-back conditions of the N-back.

CONCLUSIONS:

Following the complete resolution of symptoms, a history of two or more concussions is not associated with changes in regional brain activation during the performance of working memory task. Compensatory brain activation may only persist during the typically brief time athletes experience symptoms following concussion.