

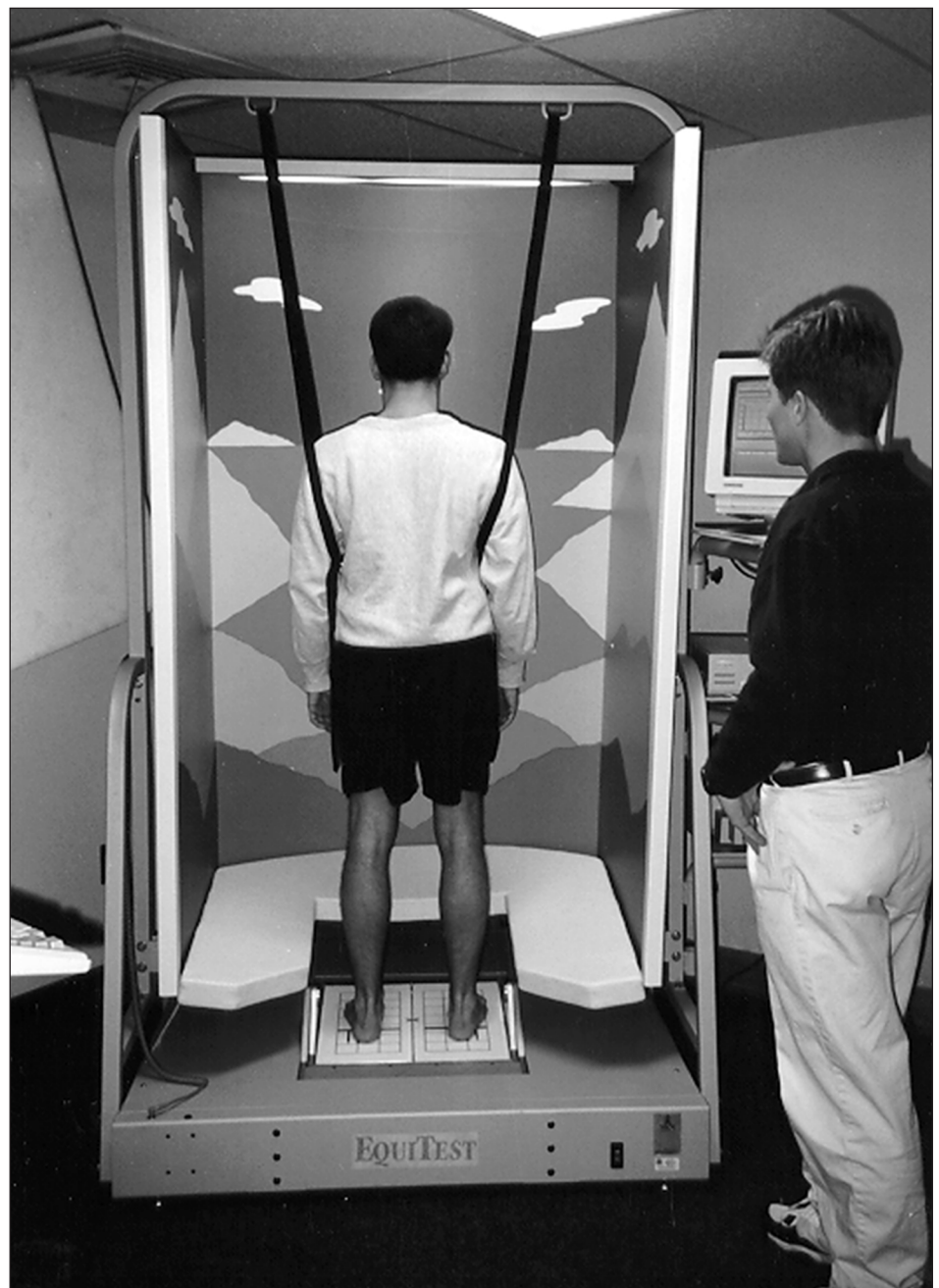


Grant Information Summary:

Effect of Mild Head Injury on Cognition and Postural Stability

Practical Recommendations

In all cases of mild head injuries, athletes should be prohibited from returning to play until day 3 of post injury and after receiving a thorough neurological exam by a medical professional.



Overview

When players engage in football, lacrosse, soccer and wrestling there is an increased chance that they may incur a mild head injury. A mild head injury was defined as a closed head injury causing mental confusion, some memory loss, and/or short term unconsciousness lasting less than 20 minutes. Sometimes, after an injury of this type, the athlete will deny having any lasting symptoms of the injury and seem normal when tested for cognitive function. The ability to maintain postural control has been cited as one return to play criteria. Using postural control, one can assess the degree and/or presence of temporary damage incurred by a mild head injury. If healing does not take place, and the athlete returns too soon, he is vulnerable to secondary impact syndrome. Fifty percent of secondary impact syndrome cases will result in death and the other half will result in some degree of permanent brain damage. Therefore, based on measurements of postural control, some guidelines of when an athlete should return to play after suffering a mild head injury have been developed.

Results

When compared to a matched control group, those with the injury scored lower on balance testing only on day 1. Among the injured group, improvement in balance was seen on day 3 post injury. These differences on the balance test were attributed to a lower level of visual input processing in the affected group when compared to the control group. No differences were found when the two groups were compared on traditional cognitive tests; furthermore, both groups improved on the cognitive tests at a similar rate. This suggests that scores on the cognitive tests can improve with practice.

In-Depth Analysis

Eleven Division I collegiate athletes who had incurred a mild head injury, from a group of 400 athletes screened during preseason, and eleven matched control subjects participated in this study. Postural stability for all subjects was measured using either the Chattecx Balance System or the NeuroCom Smart Balance Master. These machines and protocols allow for both measurement of center-of-pressure travel and the influences of the controlling sensory systems. Five separate cognitive tests (Paced Auditory Serial Addition Task, Trail Making Test A, Wechsler Digit Span Test, Stroop Test, and Hopkins Verbal Learning Test) were given to assess the subject's neuropsychological ability. After suffering a mild head injury, the athlete returned for follow-up testing 1,3,5 and 10 days post injury and post season. These test values were compared to preseason screening values. Separate analysis of variance with repeated measures were used to quantify differences between the 11 injured and 11 matched control groups. The Tukey Honestly Significant Difference (HSD) procedure was used for all post hoc tests. It seems that a mild head injury causes a sensory integration problem stemming largely from a difficulty in processing information from the visual system. Injured subjects did not return to near normal until at least 3 days post injury and seemed to improve further on day 5. No differences were found on the cognitive tests. ■

Researchers

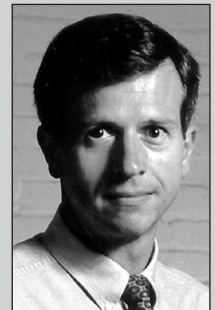
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For further information:

Abstract (2 parts) of this information were published in (1) the Supplement to the *Journal of Athletic Training* (31) 2:S-43, 1996, and (2) the Supplement to the *Journal of Athletic Training* (33) 2:S-8, 1998. This information was also presented at the 1998 NATA Annual Meeting & Clinical Symposia.



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