TACSM Abstract

Assessment of Multiple Concussive Athletes with Dual Task Triple STROOP and Aerobic Exercise

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ABSTRACT

BACKGROUND: Athletic concussion testing has mostly recently relied on a sedentary computer neurocognitive test battery called the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT). Previous tests directly compare baseline with post-concussion analysis of patient in regards to different cognitive aspects including; working memory, processing speed, and response time. No physical tests are included in the ImPACT analysis for return-to-play action. **PURPOSE:** In previous studies from our lab in these populations we concluded that the combination of a physical neural impediment with cognitive tests (dual-task with balance impairment) created a greater degree of impairment not observed in the sedentary ImPACT test. However, changes in the Post-concussed group were significant but not statistically significant in the participants with 5 or more concussions without a concussion diagnosed in the past month. Thus we hypothesized that increasing the degree of neural impediment with exercise at a moderate workload during treadmill exercise while completing a neurocognitive test (Triple Stroop) would show a higher cognitive impairment in the Post-concussed participants. **METHODS:** In this test participants were asked to come back to the lab within a week of completing their hour long cognitive battery to assess potential neurocognitive deficits of post concussive symptoms similar to our previous work. During the follow-up visit that participants completed the battery of Triple Dual Task Stroop while on a treadmill. After a brief 4 minute walking warm up, participants were tasked with increasing their speed in one minute speed increases until they reached their age and resting heart rate calculated 60% of heart rate reserve. At that point they were given a random sequence from the 4 possible patterns of the Triple Stroop 120 question cognitive test which asks the shape, color of the work, the word color, and/or the color of the shape. **RESULTS:** Of those who participated in the study (9 non-concussed and 7 multi-concussed) there is significant differneces in the cognitive deficites between the two groups of control and multi-concussed tested. However, there is a time deficit on average in the multi-concussed group, 108 seconds to complete as opposed to the non-concussed (84 sec) In addition the number of correct per minute was higher in the control than the multi-concussed group.**DISCUSSION:** These results have shown that it takes multi-concussed participants a greater time to process the cognitive testing while having the distraction of a physical test. The ultimate concern associated with the cognitive and reaction time deficits can be that atheltic trainers and/or coaches are allowing their athletes to participate in the event placing the athlete at a greater risk for additional head injury in sports with higher incidence of concussion including football, basketball, soccer and hockey. In addition to testing non-concussed and multi-concussed athletes, we aim to conduct the procedure on those who are recently diagnosed as post-concussed to determin whether a more appropriate field test like the Triple Stroop would show a more sensitive assessment of cognitive deficit in sports concussion protocols.