SIDELINE SCREENING FOR BALANCE AND NEUROCOGNITION
THERE’S AN APP FOR THAT …

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Question:
Are measures of neural function obtained with the Concussion Manager app in healthy athletes similar to SCAT2 test results?

Background:
• Symptoms of concussion can be subtle, have variable onset, and can be difficult to measure.
• Identifying a concussion accurately is critical for preventing subsequent brain injuries, particularly in youth sports.
• Current tests of neural function are not practical or objective when used in practice/play settings.

SCAT2 test1:
• Widely accepted as a “sideline evaluation” tool
• Free to use; 20-minute one-on-one interview
• Subjective scoring; requires training to administer
• Standardized testing & multiple baselines not common

Concussion Manager app:
• Developed for Apple iOS devices; uses on-board accelerometers to measure balance objectively.
• Also measures Memory (working & recognition) and Reaction Time (simple & 4-choice).
• Immediate display of results; also on-line access
• Spreadsheet reports available for detailed analysis

Methods:
• Obtain informed consent & demographic data
  - 22 members of the KC Spartans full-contact women’s football team
  - 30 ± 5.5 years old, 15 ± 1.7 years education, 28.4 ± 4.8 BMI
  - 41% of subjects reported prior head injuries (8 of 22)
  - 27% reported more than one head injury (6 of 22)
  - 14% have been diagnosed with concussion (3 of 22)
• SCAT2 test (20 min) given by trained administrator
• Concussion Manager testing (5-7 min) with iPod Touch
  • Test results compared to determine extent of agreement between SCAT2 and CM app measures
    - Bland-Altman analysis determines “agreement” of scores across tests, irrespective of differing measurement scales; is more robust than tests of variance or correlation when test format is a consideration.

Answer #1: Yes
• Balance tasks
  - Strong agreement across tests
• Memory tasks
  - Good agreement across tests

Plus:
• Reaction time
  - Strong agreement across tests

Conclusions:
Concussion Manager app is a viable alternative to the SCAT2 in screening for concussion symptoms
• High agreement of CM app & SCAT2 test results
• Objective (CM app) vs. subjective (SCAT2) balance tests
• CM app includes reaction time measures, automatic data recording, and on-line access to current & prior test results
• Supports evidence-based education through hands-on involvement of stakeholders (athletes, coaches)

Implications & Observations:
• Wider use in concussion awareness & symptom screening
• Testing/monitoring does not require return visits to clinic
• Further study is warranted for detecting lingering concussion symptoms & monitoring trajectory of recovery

References:

Classified: Secured

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