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Dr. John De Finney Research Funding Grant - Perceptual-cognitive capacity as a determinant of clinical recovery in athletes' post-concussion

Abstract

Introduction:

Concussion incidence is progressing and sports activities account for a significant proportion of hospitalizations associated with this problem. To date, recovery is mostly established by measuring the presence of physical and cognitive signs and symptoms. Due to its subjective nature, concussion management represents a challenge for clinicians since they do not have access to satisfactory diagnostic tools to confirm or deny the presence of a concussion. In fact, some athletes return prematurely to their sport with deficits that are difficult to detect with current assessment tools. Sport practice with such deficits is detrimental to performance exposing them to unnecessary risks.

Paediatric studies have shown that perceptual-cognitive functions measured using a Three- Dimensional Multiple Object Tracking (3D-MOT) device could be a reliable concussion recovery marker. In adults, 3D-MOT shows a stronger association to symptoms presentation than widely recognized concussion identification tools, showing the promising role 3D-MOT could play. However, no studies have yet assessed the potential of 3D-MOT as a clinical recovery marker in adults following concussion.

Objective:

Determine the added value of a 3D-MOT protocol in adults to establish concussion diagnosis and recovery.

Methods:

200 athletes will be recruited in pre-season to complete an initial concussion assessment (ImPACT, VOMS, reaction time, self-efficacy questionnaire) and a 3D-MOT session. Following a concussion, injured athletes will be evaluated during five additional 3D-MOT sessions after which the initial assessment will be repeated. As a comparison, a healthy control group from the same population will follow the same process.

Expected outcomes:

We anticipate that concussed athletes will demonstrate an initial reduction in their 3D-MOT performance following the injury and a learning delay compared to the control group during the initial 3D-MOT sessions that should normalize within 7 to 14 days post-injury. An association

between 3D-MOT results and the evolution of the initial concussion assessment is expected.

Dr Alexandre Deschamps graduated in chiropractic at UQTR in 2020 where he had the opportunity to develop his interest in sport's chiropractic while treating the school's swimming team. His academic implications and early research interest earned him the Foundation's chiropractic student award of excellence. At the master level, Alexandre chose to work with two sport's therapists from the department of physical activity sciences of the UQTR to expand his knowledge about to the management of sport concussions. His current project aims to determine to added value of a three-dimensional multiple-object tracking device to access cognitive healing following a concussion.

