



Defense and Veterans Brain Injury Center “Clinical Updates in Brain Injury Science Today [CUBIST]” Podcast

“Persistent impairment based symptoms post mild traumatic brain injury: Does a standard symptom scale detect them?”

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Defense and Veterans Brain Injury Center “Clinical Updates in Brain Injury Science Today [CUBIST]” Podcast

Episode 204: Standard post-mTBI symptom tools and detecting impairments post-injury

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Betsy Myhre: The views, opinions and findings contained in this podcast are those of the host and subject matter experts. They should not be construed as official Department of Defense positions, policies or decisions unless designated by other official documentation.

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Myhre: Hi! Welcome to Clinical Updates In Brain Injury Science Today, or CUBIST, a podcast for health care providers about current research on traumatic brain injury, also known as TBI.

This program is produced by the Defense and Veterans Brain Injury Center, otherwise known as DVBIC. I’m your host today, Betsy Myhre. I’m a nurse practitioner in the Clinical Practice and Clinical Recommendations division here at DVBIC.

In today’s episode, I’ll be talking with Dr. Donald Marion. Dr. Marion is a neurosurgeon at DVBIC. Don and I will discuss a study entitled: Persistent impairment based symptoms post mild traumatic brain injury: Does a standard symptom scale detect them? by Galea, O’Leary, and Treleaven, and published in the February issue of the Journal Musculoskeletal Science and Practice.

Myhre Hi, Don

Marion: Hi Betsy, how are you?

Myhre: Good. Thank you. Can you tell us a little about this study-what are the key findings?

Marion: The investigators evaluated 62 mild TBI patients 1-6 months after their injury with a variety of outcomes assessment tools. They found that only 28% of individuals asymptomatic at 1-6 months after injury had abnormal scores on the most commonly used mTBI symptom scale in Australia, the Head Injury Scale (HIS). However, when the patients were given more detailed impairment specific tests, as expected, 94% of symptomatic individuals had abnormal scores, but so did 62% of “asymptomatic” individuals-34% more than

were detected with the HIS. They concluded that a significant number of individuals post-mTBI may experience ongoing impairments, and standard post-mTBI symptom tools may not detect all impairments post injury.

Myhre: What are the most commonly used outcomes assessment tools?

Marion: For this Australian study they used the HIS - a self-report tool with 16 items that the patient is asked to rate on a Likert scale (0=never, 6=always). The 16 questions are grouped into the following categories: Somatic (headache, nausea, vomiting, balance, sensitivity, numbness); Cognitive (slowed down, in a fog, concentrating, remembering); and neuropsychological (fatigue, falling asleep, sleep more than usual, drowsiness, sadness, nervousness).

The most commonly used and validated outcomes assessment tools in the US are the Glasgow Outcome Scale – Extended (GOSE), the Rivermead Postconcussion Symptoms Questionnaire (RPQ), and the Patients Health Questionnaire-9 (PHQ-9). The GOSE is a global assessment of functioning tool for the areas of independence, work, social, and leisure activities, and participation in social life. The RPQ consists of 16 items for cognitive (RPQ cognitive), emotional (RPQ emotional), and physical (RPQ somatic) domains and patients are asked to rate on a Likert scale the degree to which each item has become more of a problem during the previous 24 h compared to before the TBI. The Patient Health Questionnaire (PHQ-9) is a reliable and valid measure of the severity of depressive symptoms. It consists of nine items that reflect typical symptoms of depression. The response choices range from 0 to 3 (not at all to every day).

Myhre: Are the outcomes assessment tools different for concussion (mTBI) vs moderate/severe TBI?

Marion: Yes. The tools mentioned above (GOSE, RPQ and PHQ-9) are commonly used for patients with mTBI/concussion. For severe TBI, the Ranchos Los Amigos Scale, Functional Independence Measure (FIM) and Neurophysical Outcome Scale (NOS) are most commonly used. Those scales are more helpful for gauging the levels of long-term or permanent disability typically associated with severe TBI.

Myhre: How was the study designed?

Marion: The goal was to determine how well a commonly used outcomes assessment tool detects clinically meaningful post-concussion symptoms. Participants included 62 individuals diagnosed with mTBI and 32 healthy controls aged between 18 and 60 years who had never sustained an mTBI and who were recruited between October 2016 and July 2018. Participants in the mTBI group had received a diagnosis of mTBI or concussion from a medical specialist based on a Glasgow Coma Scale score of 13–15, post traumatic Amnesia <24 h, loss of consciousness <30 min following injury, or alteration of consciousness for at least 30 min post-injury. The 62 patients in the mTBI group were then subdivided into a “symptomatic”(n=33) and an “asymptomatic”(n=29) group based on their response to the question “Are you continuing to experience symptoms in relation to your most recent concussion?”.

The subjects were then administered the HIS, as well as 8 different impairment specific self-report clinical tools:

- The Neck Disability Index
- The Dizziness Handicap Inventory short form
- The visual complaint index
- Space and motion discomfort II
- The hyperarousal subscale
- The fatigue severity scale

- The Pittsburgh Sleep Quality Index
- The Depression, Anxiety and Stress Scale short form

At 4 weeks to 6 months after injury the self-reported outcomes for the HIS were compared with those for each of the 8 impairment specific clinical tools among each of the 3 subgroups: “healthy controls (no history of TBI)”, “asymptomatic mTBI”, and “symptomatic mTBI”. Compared with healthy controls, asymptomatic mTBI patients had significantly more complaints of neck pain and hyperarousal, and nearly significantly more complaints of fatigue.

Myhre: What are the limitations of this study?

Marion: The study was conducted using a screening tool popular in Australia (e.g. the HIS) but not typically used in the US. While the GOSE does not directly ask about the presence of neck pain, it is possible that such somatic complaints would affect scores in the higher range. The study did not include a quality of life scale that might have revealed extracranial problems such as post-traumatic neck pain that impaired the patient’s quality of life.

Myhre: What are the key take aways from this study?

Marion: A diverse range of symptoms such as cervical, vestibular, and physiological may be present in individuals following mTBI that can persist for months or longer. Symptoms may also be present in individuals who overall consider themselves symptom-free. Many generic self-reported symptom scales may not detect symptoms in these apparently asymptomatic individuals. None of the 3 most commonly used self-report outcomes tools (GOS-E, RPQ, or PHQ-9) ask about neck symptoms or hyperarousal. Decisions regarding recovery and return to activity following mTBI require a more comprehensive examination beyond the common concussion screening tools that considers several factors including potential impairment of the cervical spine, and most importantly, quality of and satisfaction with life.

Myhre: Thank you Don for your insights. That’s all we have time for today. We hope you enjoyed this quick literature update.

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CUBIST Is produced and edited by Deborah Bailin and was hosted today by me, Betsy Myhre. It is a product of the Defense and Veteran's Brain Injury Center, led by national director CAPT Scott Pyne, Medical Corps, United States Navy.

Thank you for listening to this episode. Next time, we will discuss TBI research getting attention in the mainstream press.

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