Developing the Hierarchical Domains of Sympathetic Activation of the Autonomic Nervous System

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Abstract

For a larger research project clinicians were tasked with identifying domains of sympathetic activation of the autonomic nervous system. Signs and symptoms used for clinical decision making during Computer Assisted Rehabilitation Environment treatments across multiple diagnoses were identified by clinicians. Domains were reduced and stratified through an informed consensus exercise.

keywords: Autonomic nervous system (ANS); Sympathetic activation of the autonomic nervous system (SAANS); mTBI; Pain; PTSD

1 Introduction

Clinicians at the Ottawa Hospital Rehabilitation Centre (TOHRC) have been using a Computer Assisted Rehabilitation Environment (CAREN) for the treatment of many conditions which have elements of sympathetic activation of the autonomic nervous system (SAANS). Civilian and military patients treated in the CAREN frequently have co-morbid SAANS conditions which can result in excessive autonomic responses which can be detrimental to therapeutic progress and in some cases even cause rehabilitation set-backs. As part of "SAANS The Bigger Picture", important domains of SAANS activity were identified as a consensus exercise among experienced clinicians treating within the CAREN environment. These domains will be used to quantify and track patient responses in an effort to use big data analytics to produce data informed therapeutic decision making.

2 Methodology

A clinical reflection exercise of all diagnostic groups seen within the CAREN was conducted to identify those with SAANS. Particular attention was paid to treatment sessions in which duo or tri diagnostic states existed within the same individual. Six experienced clinicians were requested to highlight SAANS signs and symptoms that require monitoring within identified diagnoses in order to tailor treatment. A total of nine domains were identified. These were reduced to six domains by consensus exercise. Further discussions led to a consensus agreement of stratification of signs and symptoms. This stratification allowed for the creation of anchor markers of signs and symptoms within each domain. The final six domains were agreed upon by the clinicians and represented most signs and symptoms of SAANS observed within the CAREN environment.

3 Results

The consensus exercise identified the following six domains in which signs and symptoms will be ordered in ascending severity.

Each domain has ascending symptom anchors with definitions of severity.

- Vestibular Domain

- Hyperarousal Domain

- Motor Systems Domain

- Sensory Domain

- Cognitive Domain

- Pain Domain

These domains, along with ascending anchors, were incorporated into the mobile application for "SAANS The Bigger Picture."

4 Conclusion

Using clinical pattern recognition skills, signs and symptoms of SAANS states have been identified as part of the normal treatment monitoring of a physiotherapist. SAANS signs and symptoms were clinically stratified to represent increasing levels of SAANS activation. The clinical consensus exercise identified important signs and symptoms domains to be transformed into quantifiable physiological measures with the use of a mobile application.