July 2018 Spasticity in Stroke

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Hello members.

We are continuing our focus on spasticity for July.

The first abstract, article, and the clinical point of view is provided below. The focus is on defining and understanding what spasticity is.

This week looking into outcome measures for spasticity: Ashworth and Tardieu, links below to access how to perform.

Enjoy.

Modified Scale and Modified Ashworth Scale
Li F, Wu Y, Li X. Test-retest reliability and inter-rater reliability of the Modified Tardieu Scale and the Modified Ashworth Scale in hemiplegic patients with stroke. *EUR J PHYS REHABIL MED* 2014;50:9-15.
Link to article: ReliabilityofthemodifiedTardieuscale.pdf

Abstract:
Background. The most commonly used tools for the assessment of spasticity are the Modified Ashworth Scale and Modified Tardieu Scale, but the results on the reliability of both scales keep equivocal.
Aim. To evaluate the test-retest reliability and inter-rater reliability of the Modified Tardieu Scale (MTS) and Modified Ashworth Scale (MAS) in hemiplegic patients with stroke.
Design. Cross-sectional study.
Setting. Inpatients referred to a rehabilitation hospital.
Population. Fifty-one inpatients with hemiplegic stroke.
Methods. MTS and MAS were collected from the affected elbow flexors and ankle plantar flexors by: 1) two raters who were blinded to the results of the other assessment. 2) one rater one day apart.
Results. In the MAS measurement, the inter-rater and intra-rater Kappa values were 0.66 and 0.69 for the elbow flexors, 0.48 and 0.48 for the plantar flexors, respectively. In the angle measurement of the MTS, the inter-rater and intra-rater ICCs were between 0.58-0.89 for the R1 and R2, and between 0.62-0.70 for the R1-R2.
Conclusion. The MAS provided moderate to substantial test-retest reliability and inter-rater reliability in the spasticity/tone measurement. The agreement of MAS elbow flexors scores was higher than that of plantar flexors scores. The reliability of angle measurement in the MTS was insufficient.
Clinical Rehabilitation Impact. Further work should avoid observing error when taking advantage of angle difference on measuring spasticity

Definitions: Spasticity-"one component of upper motor neuron syndrome. It is characterized by a velocity dependent increase in the tonic stretch reflexes with exaggerated tendon jerks, resulting from the hyperexcitability of the stretch reflex"
Clinical Point of View:

- Modified Ashworth Scale (MAS) and the Modified Tardieu Scale (MTS) are the most commonly used tools to assess spasticity. Studies use MAS to evaluate spasticity treatments.
- MTS measures/compares muscle reaction to passive stretch at slow and fast velocities- thought to be a better alternative to the MAS.
- Many studies have looked at intra and inter-reliability of both scales with equivocal results. (Some intra-rater/inter-rater reliability for some muscle groups but not others in various patient populations).
- The stimulus in both scales is not well controlled; no standard for test position, number of reps when testing, speed of testing and testing time. This study tried to control for this.
- Authors found MAS did not suitably reflect spasticity according to the defining characteristic, but they suggest use for measuring tone. MAS reflects muscle overactivity (elements of spasticity, spastic dystonia, muscle stiffness).
    - moderate to substantial test-retest reliability (agreement higher in elbow flexors than plantar flexors). Likely due to more ROM at elbow for testing.
- Authors report MTS quantifies spasticity but does not define quality of muscle reaction and can be time consuming.
    - reliability of angle measurement was sometimes insufficient.
- Authors suggest need to design a better scale that can measure spasticity accurately.

Modified Ashworth Scale Link:
https://www.sralab.org/sites/default/files/2017-06/Modified%20Ashworth%20Scale%20Instructions.pdf
Modified Tardieu Scale Link:
https://www.sralab.org/rehabilitation-measures/tardieu-scalemodified-tardieu-scale

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