Inter-rater Agreement and Validity of the Functional Activity Component Scale (Sit-to-Stand) [FACS(STS)]

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Introduction

Physiotherapy intervention during neurological rehabilitation focuses on the re-education of motor control to allow functional movement and therefore functional activities to be achieved.

Functional outcome measures, such as the Rivermead Mobility Index (RMI), used by multi-disciplinary teams are effective in monitoring patient progress at a function and participation level (WHO, 2001). However, the smaller changes in movement control that occur as a consequence of physiotherapy intervention, or progressive disease process, are more subtle and go undetected by these measures.

The ability to stand up from sitting allows integration within the environment and use of the upper limbs whilst in an upright stance (Figure 1), and therefore is a prerequisite to many activities of daily living (Pai and Rogers, 1991). Loss of movement control during this activity hampers balance and leads to loss of independence and falls.

The FACS(STS) (Table 1) was devised to assess the degree of normal production of the activity of STS in neurological patients. It was developed from the component parts of STS identified from research literature, to provide a measurement tool that is able to detect small changes in component movement production within STS (Sarin, 2000).

Aim

• To determine the relationship between novice and expert physiotherapists (inter rater) scores when using the FACS(STS) with neurological patients

• To test the criterion-related validity of the FACS(STS) in relation to the RMI

Figure 1
Sit-to-stand allows us to have easy access to activities of daily living, such as answering the phone, or rising to go to the door to greet a visitor.

Method

Two raters were used for this pilot study. One rater was an experienced neurological physiotherapist, the other a 2nd year physiotherapy student.

Both raters independently viewed 12 video clips of neurological patients performing STS once. All patients had previously been rated using the RMI by a separate assessor. The raters were blind to the RMI scores.

Each video clip was rated using the FACS(STS), with scoring based on a scale of 0-3 for each of 6 components. An overall score of 18 is reflective of normal achievement of the STS activity. (Table 2)

Spearman's Correlation Co-efficient was used to evaluate agreement between raters' scores and the relationship between RMI and FACS(STS).

	Phase 1 Flexion-momentum Start to initial weight shift/lift off	Phase 2 Momentum-transfer Lift off to max dorsiflexion	Phase 3 Extension Max dorsiflexion to hip extension ceases	SCORE
Head	Extension in relation to	the trunk	Flexion towards vertical axis	
Shoulder girdle	Protraction		Moves up and back	
Pelvis	Anterior tilt		Posterior tilt to midline	
Hips	Flexion	Extension to full	stance	
Knees		Extension		
Ankles		Dorsiflexion	Plantarflexion to neutral	
			TOTAL	

Table 1
Functional Activity Component Scale (Sit-to-Stand)

Table 2
Scoring system for the FACS(STS)

Score

0 = not able to produce movement at all
1 = component achieved in part only
2 = whole component achieved, but not consistently or totally accurately
3 = whole component achieved consistently

Results

Correlation of the degree of agreement on the 12 measures taken by the 2 raters was calculated using Spearman's Correlation Co-efficient and showed a significant correlation between novice and expert rater scores giving r = 0.866, p = 0.01 (2 tailed).

FACS(STS) scores for both raters were analysed for correlation with the RMI scores. There was found to be a significant correlation between the validated RMI, with the expert rater results of r = 0.68, p< 0.05 (Figure 2), and novice rater with r = 0.79, p< 0.01. (Figure 3)
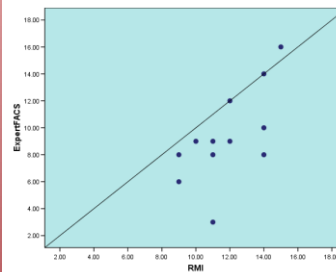

Figure 2
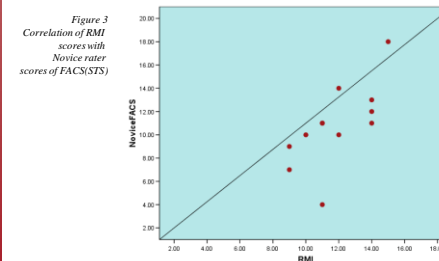*Correlations between RMI scores and Expert rater FACS(STS) scores*

Figure 3
Correlation of RMI scores with Novice rater scores of FACS(STS)

Figure 4
Sit-to-Stand

Conclusion

In this pilot study two raters, with different levels of experience in assessing normal movement and movement dysfunction, were able to show significant agreement when using the FACS(STS) on video clips of neurological patients.

FACS(STS) scores were able to reflect the patients' functional activity levels, as indicated by its correlation with the RMI.

Re-education of normal movement control to allow function is a vital part of neurological rehabilitation. STS is the bridge between static & dynamic activities, and as such acts as a transition point between levels of independence. As such, a measure of achievement, progression or regression of STS is an important tool for use in clinical decision making and discharge planning (Laferriere et al, 2001).

The FACS(STS) is being developed to provide the means to specifically measure this area. Further investigations into the clinical application should be conducted.

References

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Ethical approval was gained through BroTaf LREC & School of Healthcare Studies Ethics Board, Cardiff University