Background: Rising from a chair is a simple task for people with normal physical capacity. However, when muscle strength and postural stability are decreased rising from a chair could implicate more time spent in sitting with the risk of a more sedentary life. There is also risk of falls when rising from a sitting position. Measuring the capacity of rising from a chair is an easy clinical test that has been used in different patient groups. The timed sit-to-stand test is a 10-repetition test of rising from a chair[1], but has not been validated for people with multiple sclerosis (MS).

Aims: The aim was to investigate construct validity of the Timed-stands test, and establish cut-off point to identify fallers.

Methods: Baseline values in a randomised controlled trial investigating balance training were used (X). The sample consisted of 84 people with MS who were able to walk 100 metres; mean age 50 years and 76% were women. The Dynamic Gait Index, Four Square Step test, 25-foot Timed Walk test, Multiple Sclerosis Impact Scale, and self-reported falls during the previous 2 months were used for validation, and establishing cut-off points for identifying fallers.

Results: Mean time to perform the 10-repetitions of timed stands was 34.1 (SD 11.3, range 10.6-74.4) seconds. The convergent validity was moderate (r=0.49-0.68) with the highest correlation coefficient found for the Dynamic Gait Index. Discriminant validity was shown with low correlation (r=0.18) for the psychological subscale of the Multiple Sclerosis Impact Scale. Significantly lower scores (p=0.011) were found for participants reporting falls (n=31). With a cut-off at 38 seconds, the sensitivity was 45% for identifying fallers and specificity 85% for identifying non-fallers.

Conclusions: A timed sit-to-stand test is a valid measure of functional capacity in people with MS, and but is more reliable for identifying people not at risk of falls than fallers.

1. Csuka M, McCarty DJ. Simple method for measurement of lower extremity muscle strength. American Journal of Medicine 1985; 78(1): 77–81.

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Relationship between the expanded disability status scale and walking capacity measures in persons with multiple sclerosis

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Background: The expanded disability status scale (EDSS) and walking capacity measures are frequently used to evaluate persons with multiple sclerosis (PwMS). The EDSS is importantly determined by ambulatory dysfunction but it is unclear if walking measures are equally predictive of the EDSS. Moreover, walking capacity is reduced in many PwMS but the level of walking impairment at various EDSS levels is unclear.

Aims: To examine the predictive value of various walking capacity measures in predicting the EDSS and to quantify the reduction in walking speed compared to norm data from healthy subjects.

Methods: In two RIMS cross sectional multicenter studies, EDSS was collected by neurologists and walking capacity was assessed with the timed 25 foot walk test (T25FWT), the two minute walk test (2MWT), the six minute walk test (6MWT) and the 12-item MS walking scale (MSWS-12) in 473 persons with mild (EDSS 1.0-4.0;n=200) to moderate (EDSS 4.5-6.5;n=273) MS. Pearson correlation coefficients were calculated between walking capacity measures and the EDSS. Reference equations/values for walking speed in healthy persons were used to quantify the reduction in walking speed in PwMS at various EDSS levels. Pitman's test was used to determine if walking capacity measures were equally predictive of the EDSS.

Results: The strongest correlations were found between the EDSS and the 6MWT in the total sample (r=-0.76, p<0.0001), the MSWS-12 in the mild MS sample (r=0.56, p<0.0001) and the 2MWT in the moderate MS sample (r=-0.51, p<0.0001). The MSWS-12 and 6MWT were better predictors of the EDSS than the T25FWT in the mild MS sample. In the total sample, walking speed was 55.7 % in the T25FWT, 61.3% in the 2MWT and 58.3% in the 6MWT of the expected walking speed in healthy persons. In the mild MS sample walking speed was 71.6 % in the T25FWT, 80.6% in the 2MWT and 78.2% in the 6MWT of the expected walking speed in healthy persons. In the moderate MS sample walking speed was 44.1 % in the T25FWT, 47.1% in the 2MWT and 44.2% in the 6MWT of the expected walking speed in healthy persons.

Conclusions: The 6MWT is the best linear predictor of the EDSS in PwMS with mild to moderate disability. In PwMS with mild disability the MSWS-12 is the best linear predictor of the EDSS, while the 2MWT is the best linear predictor of the EDSS in PwMS with moderate disability. PwMS walk slower than the expected walking speed in healthy persons.

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Can we correlate the MDST with the EDSS, the 25FwT, the 6MWT and the age in PwMS?

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The majority of patients with multiple sclerosis (PwMS) experience a decrease in their mobility as their disease progresses. It's well known now that movement and exercise therapy are beneficial: they can induce a (partial) recuperation of functional motor loss or maintain the present level of functional mobility. In the past several years, many studies have shown that fitness and power exercises have a positive impact on fatigue and general physical capacity of PwMS.

In the rehabilitation department from the NMSC, we work within a multidisciplinary team composed from PT, OT, speech therapist, social workers, psychologist en neuropsychologist, rehab nurses and rehab doctors.

In this study data from more than 850 patients is examined and the MDST (Melsbroek Disability Scoring Test) is correlated with demographic data of patients, EDSS, walking tests.

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Validation of a self-monitoring tool measuring functional status in people with MS with minimal gait impairment

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Background: Multiple sclerosis (MS) results in lower limb functional limitations (Broekmans et al 2013). With an average onset age of 30 years, people with MS (PwMS) live most of their