Assessing the Predictive Validity of the TUG, Timed Up and Go Test, and a Falls Screening Questionnaire to Determine the Risk of Falling in People with Multiple Sclerosis

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Background

Multiple Sclerosis is a chronic disease with a high falls incidence of greater than 50% (Gunn et al, 2013)[1]. Poor balance and cognition, progressive MS and use of a mobility aid are all risk factors associated with falling. Predictive tools are essential to allow early identification of PwMS who are at risk of falling and initiate more timely and appropriate falls prevention interventions. As of yet there is no reliable, quick, easy to use falls assessment tool validated for people with MS. The Timed Up and Go (TUG) (see Figure 1) is a dynamic walking test frequently used by clinicians; it is an objective measure which is quick to administer and therefore useful for busy neurology clinics. The addition of an arithmetic task to the TUG forms the TUG-Cognitive. The Symbol Digit Modalities Test, SDMT, has been shown to be a reliable screen for cognitive impairment in MS with good psychometric properties and is quick and easy to administer (Drake et al, 2010)[2]

Aim

The objective of this analysis is to examine the difference between fallers and non fallers for the timed up and go test (TUG) with and without cognitive challenges, and the Symbol Digit Modalities Test (SDMT).
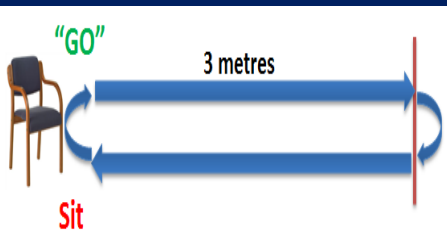

Figure 1. TUG/TUG-C Administration

Methods

Consecutive patients with MS attending the Neurology service in a tertiary hospital were recruited. Data collected included the EDSS score (disability), SDMT score (cognitive impairment), time since diagnosis, type of MS and walking aid(s) used. Consenting participants completed a questionnaire of falls risk factors, TUG and SDMT.
Falls were prospectively recorded for 3 months using falls diaries and participants were also asked about retrospective falls. A descriptive analysis of the data was carried out using SPSS. Paired t or related non-parametric tests were used to test for significant changes in each parameter between the TUG and TUG-C.

Results

Mean age of participants (N=75) was 54.4 (SD 10.33) and 67% were female. Mean disease duration was 14.4 (SD 9.24) yrs. The majority of the group had secondary progressive MS (53%) and 75% used a walking aid. 49% of the group reported falls retrospectively and 51% of the group recorded falls prospectively. EDSS scores ranged from 3 to 6.5 with a mean of 5.45 (SD 1.05).
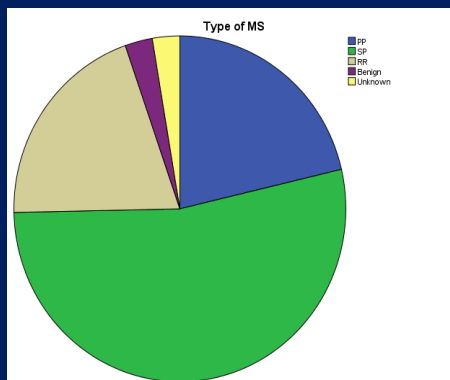
Results
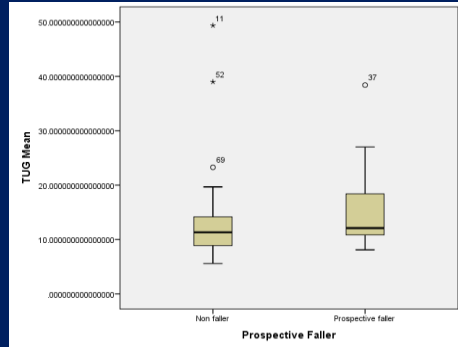
There was a total of 539 falls recorded over the 3 month period from 38 participants. 58% of the fallers were multiple fallers (> 1 fall).There was a statistically significant difference (Mann-Whitney U test) in the TUG scores between fallers 12.1(7.6 IQR) and non-fallers 11.3(5.4 IQR) (p=0.041) but not in the TUG cognitive scores 13.7(10.7 IQR) for fallers and 13.2(6.3 IQR) for non-fallers. There was no statistically significant difference between fallers and non-fallers in SDMT scores with a mean difference of 2.2, 95% CI (-7.5, 3.2), (p=0.425). (Independent Samples T Test).

Conclusion

Initial analysis suggests that there is a difference in TUG scores between fallers and non-fallers but not with TUG cognitive or SDMT. Data collection is ongoing and further analysis of a larger sample will be carried out. A simple screening questionnaire will also be evaluated in this study, along with combinations of disability, symptoms and walking mobility in order to develop a fall risk algorithm and thus prompt more focused and timely interventions.

References:

[1] Gunn, H. J., Newell, P., Haas, B., Marsden, J. F. and Freeman, J. A. (2013) 'Identification of Risk Factors for Falls in Multiple Sclerosis: A Systematic Review and Meta-Analysis', Physical Therapy, 93(4), 504-513.

[2] Drake, A.S., Weinstock-Guttman, B., Morrow S. A., Hojnacki D., Munschauer F.E., Benedict R.H.B. (2010) ' Psychometrics and Normative Data for the Multiple Sclerosis Functional Composite; replacing the PASAT with the Symbol Digit Modalities Test', Multiple Sclerosis, 16 (2), 228-237.