**COMPARISON OF NEUROLOGICAL SCALES USED FOR DISABILITY ASSESSMENT IN MULTIPLE SCLEROSIS**

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### Background

There is no “gold standard” to assess disability in patients with MS. The most widely used Expanded disability status scale (EDSS) has some disadvantages: it is biased towards motor function, there is no distinction of cognitive and emotional functions, fatigue category is absent. Moreover, objectively assessed neurological lesion doesn’t always correspond strictly to true. According to the authors of the scale, the majority of neurologists around the world thought that there was no relevant scale to estimate disability in MS (85% of respondents) and there was a need for a new (97% of respondents), which must be multidimensional (83%,2%), ordinal (40%), patient orientated (46,6%) and not biased towards any particular disability (56,7%). The GNDSS correlated strongly with the EDSS (0,75), Scripps neurological rating scale (0,78) and Functional independence measure (0,81). It was found to be reliable when applied by a nurse or patient’s relative (compared to neurologist’s data) and valid while applied over the phone, too.

The GNDSS is not biased towards any particular function, fatigue category is present, it shows the impact of symptoms on patient’s daily life, but it is subjective, so there is a possibility of dissimulation or aggravation. The GNDSS structure is presented in the [Fig. 1](#).

### Objectives

1. To assess the relation between the EDSS and the GNDSS, find out the GNDSS functional groups, to which the relation of EDSS is the strongest;
2. To assess the GNDSS and the EDSS relation to depression and anxiety symptoms;
3. To assess the relation of GNDSS- and EDSS-estimated cerebral functions and cerebral functions-fatigue complex score to depression and anxiety.

### Methods and results

A questionnaire survey was performed in the Neurology center of Vilnius university hospital Santariskiu clinics. 56 multiple sclerosis (MS) patients filled the questionnaire and were examined neurologically from October 2009 till March 2010. Inclusion criteria: MS diagnosis confirmed by 2005 Revised McDonald Diagnostic Criteria for MS. Exclusion criteria: serious comorbid condition, constant use of antidepressants. The EDSS and the GNDSS sum score (ss), scores of separate functions, the HADS anxiety and depression scores (HADSad(n) and HADSad) were estimated. Data were analysed with SPSS 17.0, using Pearson correlation coefficient and were considered statistically relevant, if p<0.05.

56 MS patients were examined, 55 of them were included into final analysis: 14 (25.5%) men, 41 (74.5%) women [Fig.2] with a median age 40,21±10,98 years (range 20-65) [Fig.3], a median disease duration 9,92±5,77 years (range 0,25-30,25) [Fig.4].

MS distribution by subtypes is shown in the [Fig. 5](#): 44 (80%) – relapsing remitting (MS RR); 8 (14,5%) – secondary progressive (MS SP); 3 (5,5%) – progressive relapsing (MS PR). Median EDSS(ss) was 3,98±1,68 (range 1,5 – 7,5); a median GNDSS(ss) 16,74±8,94 (range 1 – 32); a median HADSad score 7,71±4,07 (range 1 – 17), a median HADSad score 6,13±3,75 (range 0 – 15) [Fig.6-9].

The EDSS(ss) correlated moderately with the GNDSS(ss) (P=0,574; p<0,001), the GNDSS limbs and fatigue sections sum score (P=0,596; p<0,001) [Fig.10].

If the GNDSS(ss) correlated moderately with the HADSad(n) (P=0,500; p=0,001) and the HADSad (P=0,500; p=0,001) scores. There was no statistically important correlation between the EDSS(ss) and the HADSad(n) and the HADSad scores [Fig. 11, 12]. The HADSad score correlated moderately with the GNDSS cognitive function and fatigue (cog fatigue/kogn_munu) sum score (P=0,509; p<0,001), and weakly with the GNDSS (cog/ kogn) (P=0,418; p<0,003). The HADSad score correlated moderately with the GNDSS (cog fatigue/kogn_munu) (P=0,574; p<0,001), and the GNDSS(cog/kogn) (P=0,492; p<0,001) [Fig.13, 14].

### Conclusions

1. Objective disability assessment estimation using the EDSS is related to subjective disability assessment using the GNDSS, mostly with limbs and fatigue sum score.
2. GNDSS-estimated disability is related to anxiety and depression, while EDSS-estimated disability is not.
3. The GNDSS cognitive disability and a complex of cognitive disability and fatigue are related to depression and anxiety. Fatigue increases cognitive disability relation to depression and anxiety.
4. Both cognitive disability and a complex of cognitive disability and fatigue have greater relation to anxiety than to depression.
5. The GNDSS scale, although is a subjective scale, could be useful in evaluation and monitoring of symptoms on patient’s daily life in addition to EDSS objective scale.

### Bibliography

- http://bse.uwe.ac.uk/dataanalysis/quantInfAssPiar.asp