Intensive neurorehabilitation is associated with improved fatigue and depression in patients with progressive MS

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Background and Objectives

Motor disability, depression and fatigue often coexist in people with progressive Multiple Sclerosis (PMS), with negative consequences on their quality of life.
Predisposing risks factors for depression in PMS could be represented by several psycho-social conditions such as inadequate coping strategies, insufficient social support, MS-related biological processes, such as brain tissue and functional changes and immunological and inflammatory pathways.
We aimed at exploring the effect of pre-existing depressive symptoms on the outcome of intensive motor neurorehabilitation treatment in PMS.

Methods

Forty consecutive patients with PMS (22 F, age 48.52± 8.18; median EDSS=6) entering our Neurorehabilitation department and participating in a randomized trial on repetitive TMS coupled with intensive motor neurorehabilitation were recruited. They were tested using 10 meter walk test (10MW), 2 and 6 minutes walking test (6MWT), MS walking scale (MSWS); fatigue severity Scale (FSS); numerical rating scale (NRS) for spasticity and pain, functional independence measure (FIM), Beck depression inventory (BDI), and paced auditory serial addition test (PASAT), at baseline (T0) and at T3, after an intensive neurorehabilitation program twice a day, 5 days/week for 3 weeks.

Results

Baseline.
Baseline population characteristics are: EDSS (5.85 ± 0.62), 6MWT(175.33 ± 87.23), MSWS(42.86 ±11.88), pain NRS (2.87 ± 2.63), FSS (42.69 ± 14.74), BDI (10.44 ± 9.23). There was a significant correlation between EDSS and pain NRS (p=0.05, r=0.316) and between FSS and BDI (p<0.001, r=0.732).
Eleven patients (28%, 4 female) had mild/severe depression (BDI > 14).
Compared with patients without depression, patients with depression had a worse FSS score (p<0,001), pain NRS (p=0.031) and disconfort NRS (p=0.031) with U. Mann-Whitney Test; the other measures did not significantly differ between the two groups at baseline.

End of treatment.
At the end of the 3-week intensive neurorehabilitation, considering all enrolled patients, a significant improvement was found for:
-6 minute test (175.33±87 vs 209.5±102; p < 0.001)
-10 meter walk test (20.06± 11.83 vs 17.30 ± 11.70, p < 0.001)
-MSWS (42.86 ± 11.88 vs 36.31 ± 11.76, p = 0.002).
-NRS spasticity scale(5.54 ± 2.05 vs 4.57 ±2.31, p = 0.004)
-BDI (10.44 ± 9.23 vs 7.81 ± 8.17, p = 0.006)
A trend of FSS improvement (42.69 ± 14.74 vs 37.78 ± 11.85, p = 0.083) and PASAT test improvement (34.69 ± 13.96 vs 39.61 ±10.32, p = 0.053) were found .

Patients with depression compared with people without depressive symptoms at baseline had a significant improvement in fatigue (delta FSS 1.47±1.8 vs 0.16±9.7; p=0.036) and depression (delta BDI 9.4±9.6 vs 1.7±3.2; p=0.025) at the end of the 3-week treatment **Figure 2.**
They also showed a trend to a greater improvement during the three weeks of neuro-rehabilitation in 6MWT (55.3± 70 vs 19± 31.7mt; p = 0.06), in MSWS (35.2±34.7 vs 9.6± 21.2; p = 0.054) and in pain NRS (-1.000±1.802 vs 0.105±1.15; p=0.059) compared to the other group, despite these measures did not significantly differ between the two groups at baseline.
The enhanced improvement in 6MWT might be due to association we have found between the recovery in 6MWT and in FSS (Spearman -0.589; p=0.002) **Figure 1.**

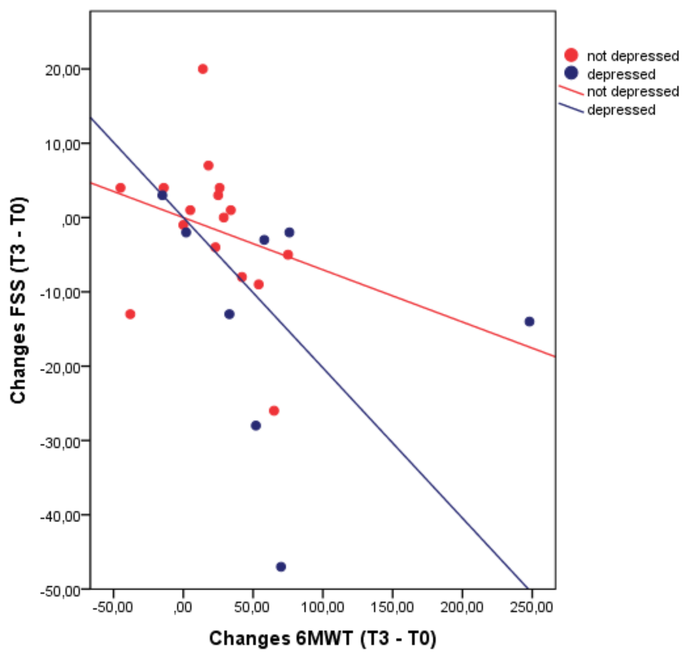

Figure 1: Correlation between changes in FSS scale and in 6MWT at baseline and at the end of 3-weeks of intensive neurorehabilitation in the two subgroups of patients with and without depression at baseline assessment.

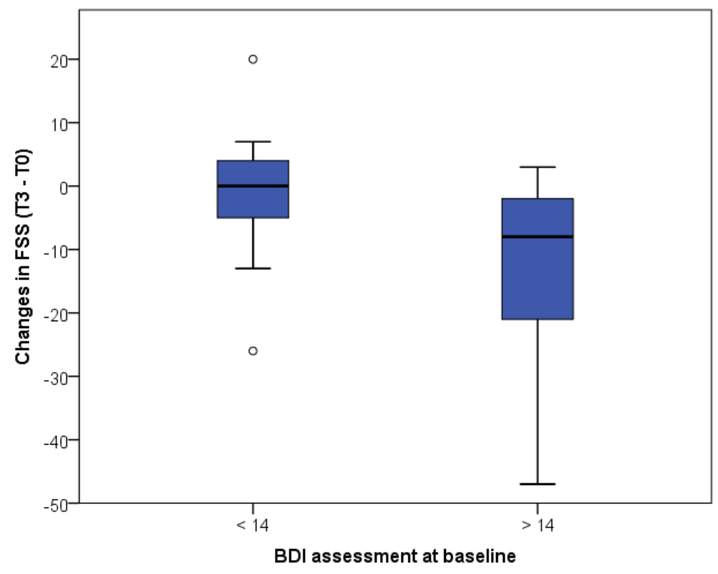

Figure 2: Changes in FSS between baseline and end of 3-weeks of intensive neurorehabilitation in patients with (BDI score>14) and without (BDI score <14) depression symptoms at baseline assessment.

Conclusions

We found a better improvement in fatigue and depression and a trend for motor and physical scales in people with MS with higher depression scores at the start of an intensive neurorehabilitation program. These data are consistent with the view that underlying depression may confound motor and fatigue measures and underline the importance to address psychological factors to enhance the positive outcome of rehabilitation treatment and its maintenance. Perceived improvement in fatigue in this group of patients might explain the tendency to a greater improvement at 6MWT and the significant improvement in depression (BDI) enhancing the positive outcome of intensive neurorehabilitation.

References

Boeschoten RE, Braamse AM, Beekman FT, Cuijpers, P, Oppen P, Dekker J, et al. Prevalence of depression and anxiety in Multiple Sclerosis: A systematic review and meta-analysis. J Neurol Sci 2017; 372(15): 331-41.

Pokryszko-Dragan A, Zagrajek M, Slotwinski K, Bilinska M,Gruszka E, Podemski R. Event-related potentials and cognitive performance in multiple sclerosis patients with fatigue. Neurol Sci 2016;37:1545—56.

Disclosure

Congiu M, Pisa M, Gelibter S, Fichera M, Comola M: nothing to disclose
Comi G has received compensation for consulting services and / or speaking activities from Novartis, Teva, Sanofi, Genzyme, Merck, Biogen, Roche, Almirall, Celgene, Forward Pharma
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