

Conclusions: SC natalizumab administration will reduce consumption of patient and HCP times per procedure, and associated costs.

Disclosure

- FM: is Editor-in-Chief of the Journal of Neurology and Associate Editor of Human Brain Mapping; received compensation for consulting services and/or speaking activities from Alexion, Almirall, Bayer, Biogen, Celgene, Eli Lilly, Genzyme, Merck-Serono, Novartis, Roche, Sanofi, Takeda, and Teva Pharmaceutical Industries; and receives research support from Biogen Idec, Merck-Serono, Novartis, Roche, Teva Pharmaceutical Industries, Italian Ministry of Health, Fondazione Italiana Sclerosi Multipla, and ARiSLA (Fondazione Italiana di Ricerca per la SLA)
- GL: nothing to disclose for this study
- CA: has served on advisory boards and/or received honoraria for speaking or consultation fees from Biogen, Merck-Serono, Novartis, Roche, Sanofi-Genzyme
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EP1255

Sensitive detection of balance impairment in early multiple sclerosis

K. Akar¹, H. Youssef¹, A. Altıntaş², A. Vural^{1,2}
¹Koç University, Motion Analysis Laboratory, KUTTAM, Istanbul, Turkey, ²Koç University, School of Medicine, Department of Neurology, Istanbul, Turkey

Introduction: Neurodegeneration starts in the earliest phase of MS and manifests itself as progressive sensorimotor impairment in people with MS (pwMS). However, current clinical measures are not sensitive to detect gait and balance deficits in early MS. Development of sensitive measures can help the selection of pwMS for early intervention and can serve as biomarkers of progression and treatment response.

Objectives: To identify a sensitive method for detecting balance impairment in people with early MS.

Methods: 56 consecutive pwMS were grouped into: 0≤EDSS≤2 (G1, n=23), 2<EDSS≤4 (G2, n=21), and 4<EDSS≤6 (G3, n=12). Healthy subjects (HC, n=23) were age and gender matched with the G1 group. Sensor-based measurements were done with an APDM OPAL wireless inertial measurement unit sensor placed on lumbar region. Patients performed 10 different quiet standing stance tasks for 30 seconds with bare feet at Koç University Movement Analysis Laboratory: feet apart on firm (1), feet apart eyes closed on firm (2), feet apart on foam (3), feet apart eyes closed on foam (4), feet together eyes open (5), feet together eyes closed (6), tandem stance on right foot (7), tandem stance on left foot (8), tandem stance on non-dominant foot eyes closed (9), one foot stance on non-dominant foot eyes closed (10). Statistical analysis was performed by Kruskal-Wallis and Mann-Whitney U tests.

Results: None of the patients in the G1 group had a cerebellar impairment or Romberg sign. The majority of the participants in the G1 group could complete Tasks 1-8, whereas 45% failed Task 9, and 85% failed Task 10.

Sensor-based analysis showed that at least one parameter was impaired in tasks 1, 3, 4, 6, 9 and 10. Sway area, RMS sway and path length were significantly different in G1 compared to HC, even during regular stance (Task 1). Even though the Romberg test was negative in all patients, 15/20 sensor-based parameters were significantly different in G1 in the Romberg position (Task 6). All of the 20 balance-related parameters measured by APDM were significantly different between in G1 during Task 4. Of note, no significant difference was observed in the early MS group during Task 7 and Task 8 (tandem stance).

Conclusions: We identified several challenging stance tasks and sensor-based parameters that are sensitive to postural balance impairment in early MS. Future studies are needed to validate their potential as a biomarker.

Disclosure

no conflict of interest

EP1256

Cholesterol in macrophage-derived extracellular vesicles drives remyelination in the brain

S. Vanherle^{1,2}, M. Loix^{1,2}, J. Guns^{1,2}, F. Mingneau^{1,2}, T. Dierckx^{1,2}, T. Vanganswinkel³, E. Wolfs³, P. Pincela Lins³, A. Bronckaers³, J. Dehairs⁴, J.V. Swinnen⁴, S. Verberk^{1,2}, M. Haidar^{1,2}, J.J. Hendriks^{1,2}, J.F. Bogie^{1,2}

¹Biomedical Research Institute - Hasselt University, Department of Immunology and Infection, Diepenbeek, Belgium, ²University MS Center Hasselt, Pelt, Belgium, ³Biomedical Research Institute - Hasselt University, Department of Cardio and Organs systems, Diepenbeek, Belgium, ⁴Leuven Cancer Institute - University of Leuven, Department of Oncology, Laboratory of Lipid Metabolism and Cancer, Leuven, Belgium

Failure of remyelination underlies the progressive nature of demyelinating diseases. Recently, we and others demonstrated

that macrophages are abundantly present in multiple sclerosis (MS) lesions and play a pivotal role in disease progression and resolution. To date, however, it remains largely unknown how macrophages contribute to CNS repair. Here, we demonstrate that extracellular vesicles (EVs) secreted by repair-associated macrophages promote oligodendrocyte precursor cell (OPC) differentiation *in vitro* and enhance remyelination in the cerebellar brain slice and cuprizone models. Additionally, by applying cholesterol depleting and enrichment strategies, we identify that the pro-regenerative impact of EVs released by repair-associated macrophages relies on cholesterol abundance, but did not depend on liver X receptor activation prior to OPC maturation. Altogether, our findings suggest that EV-associated cholesterol is a driving factor in the regenerative impact of lesional macrophages on OPC maturation and remyelination, potentially having broad implications for diagnostic and therapeutic strategies aimed at promoting remyelination.

Disclosure

Nothing to disclose.

EP1257

Relationships between employment status and patient-reported outcome and objective cognitive measures in patients with relapsing-remitting multiple sclerosis

F. London¹, S. El Sankari², G. Landenne², Z. Benyahia², V. van Pesch²

¹CHU UCL Namur Godinne, UCLouvain, Neurology, Yvoir, Belgium, ²Cliniques Universitaires Saint-Luc; UCLouvain, Neurology, Brussels, Belgium

Introduction: Unemployment is a major problem in multiple sclerosis (MS) as half of patients with MS (PwMS) are unemployed within 10 years of diagnosis.

Objectives: To investigate employment status of PwMS and its relationships to objective cognitive and self-reported health measures, at baseline (T0) and after 12 months (T1).

Methods: A 3-year prospective, multicenter, study was conducted in a sample of adult patients with relapsing MS initiating a new treatment. Participants underwent neurological examination (EDSS), neuropsychological evaluation (SDMT, BMTR-R, CVLT-II), brain MRI, and completed selected self-reported questionnaires to assess executive functions (20-item Dysexecutive Questionnaire), fatigue (French version of the Fatigue Impact Scale), anxiety (Beck Anxiety Inventory-BAI), depression (Beck Depression Inventory - BDI), physical and psychological impact of MS (29-item MS Impact Scale - MSIS-29), health-related quality of life (SEP-59 scale).

Results: 59 patients with RMS (mean age 39 ± 9.8 years, 79.7 % female) were enrolled. The mean time from diagnosis was 7.18 ± 7.5 years, median EDSS was 2.0 (interquartile range (IQR): 1.5-3.0). Thirty-nine (66%) were employed at T1, and 37 (69.8%) were still employed at the T1 evaluation ($p=0.67$). In comparison with employed patients, unemployed individuals had higher EDSS at T0 (median 3.0 (IQR 2.0-4.0) vs 2.0 (IQR 1.0-3.0),

$p = 0.0006$) and T1 (median 2.0 (IQR 1.0-2.75) vs 2.75 (1.5-4.0)). No significant differences were observed on cognitive performances between the 2 subgroups at the 2 time points, except for BVMT-R which was significantly lower in unemployed patients at T0 ($p=0.04$). At T0, unemployed patients reported higher MSIS-29 scores for both physical (39.21 vs 20.68, $p=0.004$) and psychological (50.29 vs 33.45, $p=0.01$) impact of MS on daily function, higher BDI scores (7.95 vs 5.17, $p=0.04$), greater problems with executive functioning (29.97 vs 20.57, $p=0.03$), and worse functioning regarding the health-related quality of life (SEP-59 global score 44.48 vs 56.54, $p=0.004$). At T1, only the SEP-59 global score remained significantly lower in unemployed patients (53.17 vs 61.82, $p=0.04$) while employed patients reported significantly lower anxiety (8.75 vs 15.37, $p=0.03$).

Conclusions: Maintenance of employment is decisive for PwMS as unemployment is associated with lower health-related quality of life.

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EP1258

Neuromuscular electrical stimulation reduces spinal excitability in spastic Multiple Sclerosis patients

M. Scalia¹, R. Borzuola¹, F. Sica², F. Monteleone², G. Borriello³, A. Macaluso¹

¹University of Rome 'Foro Italico', Department of Movement, Human and Health Sciences, Rome, Italy,

²Santa Maria Goretti Hospital, Multiple Sclerosis Centre, Latina, Italy, ³Fatebenefratelli Hospital, Multiple Sclerosis Centre, Rome, Italy

Introduction: The use of neuromuscular electrical stimulation (NMES) has recently been proposed in patients with neurological diseases, such as spinal cord injuries and stroke, to improve spasticity related symptoms (SRS), resulting in both an increased control of voluntary movements and an improved functional ability in daily activities. These results could be related to a reduced spinal excitability, which is known to be enhanced in patients with spasticity. However, there are no studies in the literature adopting NMES to improve SRS in patients with Multiple Sclerosis (MS).