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Background: The aim of our study was to explore the use of digital biomarkers to distinguish healthy controls (HCs) from patients with radiologically isolated syndrome (RIS).

Methods: We developed a smartphone application called MS Screen Test (MSST) to explore several dimensions of the neurological examination such as finger tapping speed, agility, hand synchronization, low contrast vision and cognition during a short evaluation. This application was tested on a cohort of healthy volunteers, including a subset of HCs who underwent two evaluations on the same day to assess reproducibility. In a second step, the application was tested in patients with RIS, and their performances were compared with age- and gender-matched HCs.

Results: Thirty-seven HCs underwent two consecutive evaluations on MSST, which showed good reproducibility for all measures. Then, the findings from 21 patients with RIS were compared with those from 32 matched HCs. Compared with HCs, patients with RIS had a lower finger tapping speed on the dominant hand (5.6 versus 6.5 taps/s; p=0.005), a longer inter-hand interval during the hand synchronization task (14.4 versus 11.3 ms; p=0.03) and significantly poorer scores on the low contrast vision and cognition tests.

Conclusion: MSST requires only a smartphone to obtain digital biomarkers related to several dimensions of the neurological examination. Our results highlighted subtle differences between HCs and patients with RIS. We plan to evaluate this tool in MS patients, which will allow a much larger sample of patients, to determine whether digital biomarkers can predict disease course.

Keywords: Radiologically isolated syndrome, Multiple sclerosis, Digital biomarkers

Disclosures: No conflict of interest or other disclosures to report.

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Topic: Management of MS during the COVID-19 pandemic

Is natalizumab a safe treatment for patients with multiple sclerosis in the COVID-19 pandemic? Data from the first year of the pandemic

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Background: Patients with MS have increased risk of infections, especially those with highly active treatments. We studied the safety of natalizumab in patients with MS during the COVID-19 pandemic.
Methods: Demographic features, time on natalizumab, dose interval and COVID-19 symptoms were evaluated in a prospective study of patients with MS receiving natalizumab during the pandemic. RT-PCR COVID-19 tests from nasopharyngeal samples were performed before natalizumab treatment.
Results: We analyzed 69 patients: 71% women, mean age 43 years. Mean treatment duration was 68 months (range: 2–141). In 32% of patients, natalizumab regimen was changed from every 4 to every 6 weeks to decrease number of hospital visits. From March to April 2020, 5 patients had COVID-19, 4 showed mild symptoms and 1 a multi-lobar pneumonia. On May 2020, we started COVID-19 screening before natalizumab infusion. From May 2020 to March 2021, tests were performed on 553 nasopharyngeal swabs. Fourteen patients had a positive result and natalizumab was stopped; tests were repeated 1–2 weeks later, with negative results, and natalizumab was restarted. In summary: 19 patients had COVID-19, 10 asymptomatic, 7 mild symptoms, 2 pneumonia (1 of whom hospitalized without mechanical ventilation). There were no statistically significant differences in age (mean±standard deviation, 35.7±11.5 vs 43.4±7.8 years; p=0.158), dose interval (5.33 vs 5.32 weeks; p=0.962) or treatment duration (5.8 vs 5.6 years; p=0.298) between patients with and without COVID-19.
Conclusion: Natalizumab treatment in MS seems to be safe during the pandemic. Most patients were asymptomatic, and no patient required mechanical ventilation.

Keywords: Natalizumab, COVID-19, Real-time polymerase chain reaction, Extended interval dosing, Safety

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Topic: Vaccination in MS

Response to hepatitis B vaccine in patients with multiple sclerosis: preliminary data

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Background: Studies in different autoimmune pathologies report a lower response rate (immunogenicity) to vaccinations than in the general population. Our objective is to analyze the immunogenicity of the vaccine against hepatitis B virus (HBV) in patients with multiple sclerosis (MS).
Methods: In a single prospective cohort of MS patients with negative HBV serology, hepatitis B (rDNA) B vaccine was administered at 0, 1 and 6 months. Immunogenicity was analyzed by the determination of antibodies to surface antigens of HBV. We considered a patient as a responder if antibodies level was higher than 10 IU/L. Posterior analysis of immunogenicity was conducted by demographic variables (e.g. MS phenotype, EDSS) and use of disease-modifying drugs (DMTs).
Results: Vaccination study of 251 patients: 160 of them were seronegative (63.7%). Patients vaccinated: 99. Overall response: 74.1%. No significant relationship by sex (female 77.6% responders, male 68.8%) and MS phenotype (relapsing forms 74.3% responders, secondary progressive 50%). Variables associated with significantly lower immunogenicity were: age (>55 years), EDSS score (median: non-