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Table 1
Interventions on follow-up patients according to the care model.

Intervention in the follow-up group	Face-to-face model	Teleconsultation model	<i>p</i>
Resolved	237 (23.2%)	259 (25.3%)	0,262
Follow-up visit	786 (76.8%)	764 (74.6%)	
Re-appointment	0	1 (0.1)	
Total	1023	1024	

We analysed general consultations due to their greater volume (1339 patients), differentiating two tasks: first visits (315 patients) and follow-up visits (1024 patients). Of the first-visit patients, 18.1% were referred for a follow-up, 16.2% were resolved and 65.7% required a face-to-face visit. Of the follow-up group, 74.6% were doing a check-up, 25.3% were resolved and only 0.1% required a face-to-face visit.

Despite the technical limitations, the percentage of resolutions of first-visit patients was not negligible (34.3%) but without a doubt, what was striking was the resolution capacity of almost 100% of the patients in the follow-up group. This data led us to perform a comparative analysis with the face-to-face model of 1023 review patients seen in the 7 weeks prior to the start of the teleconsultation model. Of these 1023 patients seen in person, 237 (23.2%) were resolved and 786 (76.8%) went for a follow-up visit (Table 1). We did not observe statistically significant differences in the outcomes of the follow-up group when the face-to-face model was compared to teleconsultation ($p = 0.262$).

Finally, we compared the number of patients who did not come to the face-to-face consultation (167, 12.5%) versus the number of patients who did not respond to the phone call (42, 3.1%), observing a statistically significant difference ($p < 0.001$).

Although we are aware of the need for longer-term comparative studies evaluating the results of teleconsultation, telehealth interventions generally seem equivalent to face-to-face care.⁴ This

Risk of SARS-CoV-2 infection and clinical outcomes in multiple sclerosis patients in La Rioja (Spain) Riesgo de infección por SARS-CoV-2 y resultados clínicos en pacientes con esclerosis múltiple en la Rioja (España)



During the beginning of 2020 we have witnessed a pandemic caused by the SARS-CoV-2 virus, which has confronted us with numerous questions, particularly in patients with special clinical characteristics, such as those suffering from multiple sclerosis (MS), many of whom are being treated with immunomodulatory or immunosuppressants that compromise their immune system, which could imply a higher risk of becoming ill or of developing a worse clinical course. To verify this hypothesis, a descriptive study has been designed by reviewing the medical records of all patients diagnosed with MS in the autonomous community of La Rioja, collecting clinical and epidemiological data.

At the time of the study, La Rioja has 316,798 inhabitants, 330 diagnosed with MS (1.04/1000 inhabitants), of which 12 have suffered from SARS-CoV-2 infection, (3.6%), nine diagnosed by PCR and three by serology. The typical patient is female (75%), 47.91 years (22–74), 75% with a relapsing remitting form and 25% secondary progressive. The mean value of the Expanded Disability Status Scale (EDSS) was 1.92 (0–8). 25% were not treated, two (16.66%) were treated with each of the following therapies: subcutaneous interferon beta-1a, dimethyl fumarate and teriflunomide, and one (8.33%) with fingolimod, cladribine and alemtuzumab.

A case was considered when the criteria of the Carlos III Health Institute for the general population were met, so as to be able to

healthcare modality is promising and has adequate resolution rates for a specific group of patients, such as those under follow-up for stable chronic diseases and those who come to the clinic to collect results. For this reason, it is vitally important to invest in and develop platforms that allow effective communication between healthcare levels and between healthcare providers-patients because, without a doubt, telehealth will be part of our daily healthcare work.

Conflict of interests

The authors declare no conflict of interest.

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establish comparisons (presence of symptoms and confirmation by PCR). The criteria were met by nine patients. As of 27th May 2020, 31 PCRs had been carried out for SARS-CoV-2, which represents 93.94/1000 inhabitants, similar to the 99.81/1000 inhabitants in La Rioja. 29.03% (9/31) were positive compared to 12.79% of the general population.¹ The incidence of COVID-19 cases among the population with MS was 27.27/1000 inhabitants, compared to 12.76/1000 inhabitants in La Rioja (OR 2.17; 95% CI 1.12–4.21).

The age distribution of the cases is presented in Table 1, highlighting 66.7% among patients with MS between 40–59 years of age, and scarce among those over 60, which represents 50% of the general population.¹

Patients with MS and COVID-19 showed an average of 3.1 (1–6) symptoms, highlighting cough and fever (66.7%), pharyngeal pain (55.6%), myalgia (44.4%), asthenia (33.3%), headache (22.2%), dyspnoea and anosmia (11.1%). The cumulative hospitalization rate for patients with MS was 22.2% compared to 36.63% for the overall rate in La Rioja¹ (OR 0.47 CI5% 0.09–2.29).

Only one patient in our series died, a 74-year-old male, secondary progressive MS, EDSS 7 and no treatment. The case fatality

Table 1
Distribution of MS patients diagnosed with COVID-19 and general population.³

Age (years)	0–9	10–19	20–29	30–39	40–49	50–59	60–69	>70
MS	0	0	11.1	11.1	44.4	22.2	0	11.1
General p.	0.7	1.2	5.8	10.1	14.4	17.2	13.8	37.0

rate was 11.1% (vs. 8.91 in La Rioja, without statistical significance). As there is a much higher percentage of PCR positives among those affected by MS, the mortality rate showed a greater difference, 3.03/1000 inhabitants vs. 1.14 in La Rioja, but without reaching statistical significance (OR 2.67; 95% CI 0.37–19.07).

Discussion

It is established that patients with MS have a higher risk of infections requiring hospitalization, pointing to a possible increase in viral infections, pneumonia and influenza.² Our results show that patients with MS have experienced a COVID-19 incidence that is more than double that of the general population and this cannot be attributed to having undergone more PCR studies.

We are aware of a study that did not show an increased risk of COVID-19 among patients with MS in China, although it was conducted through questionnaires and personal communication from patients, and the authors themselves argue that this may have left out many patients with minor symptoms or who refused communication to avoid quarantine in designated facilities.³

Among the symptoms, the most common in our series were cough and fever, with a low incidence of anosmia, similar to what was published.⁴ The hospitalization rate in our series is slightly lower (without statistical significance) among MS patients in the context of a lower mean age.

Finally, in terms of mortality, the rate was 11.1% among our MS patients. This figure does not differ much from the general population. In a multicenter study carried out in Italy, 57 patients with positive PCR were detected, of which five died (8.77%), all with EDSS ≥ 6.5 ⁵ and in another publication with a series of eight cases in the United States, two died, with EDSS of 7.5 and 8.5,⁴ in line with what was observed in our study.

In conclusion, the incidence of COVID-19 cases among patients with MS in our series is double that of the general population, despite not having performed a higher number of tests.

The hospitalization and fatality rate has been similar, affecting a 74-year-old patient with high EDSS, in line with the experience reported by other groups.

Given a similar fatality rate in a context of higher infection incidence, the mortality associated with COVID-19 infection among our MS patients tends to be higher than in the general population, but without reaching statistical significance.

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Conflict of interests

The authors declare no conflict of interest.

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