MULTIPLE SCLEROSIS JOURNAL | MSJ

Letter

Alemtuzumab in multiple sclerosis during the COVID-19 pandemic: A mild uncomplicated infection despite intense immunosuppression

Date received: 8 April 2020; accepted: 23 April 2020

Italy has been one of the first European countries to face the spread of Coronavirus Disease-2019 (COVID-19). The affected patients have increased inexorably worldwide, reaching a pandemic dimension within a few weeks. The outbreak of COVID-19 represents a challenge for neurologists treating multiple sclerosis (MS). No data is available on whether patients with MS are at increased risk to develop severe forms of COVID-19. Since lymphopenia and immunosuppression are associated with worse outcomes,[1] it is reasonable to hypothesise that MS-immunosuppressive treatments may lead to more severe infections, but there is no evidence to support this.[2] We describe a case of mild uncomplicated COVID-19 occurring during intense immunosuppression a few days after alemtuzumab infusion.

On the same day that the first COVID-19 case was reported in Italy (21 February 2020), a 25-year-old girl with relapsing-remitting MS – working as a nurse in Milan – completed the second cycle of alemtuzumab treatment. She had started it 1 year before as first-line therapy due to highly active MS, and since then she had not experienced clinical relapses or new magnetic resonance imaging (MRI) activity. One week after the first Italian COVID-19 case, the patient was advised to stay home from work, due to the alarming spread of new affections. Nevertheless, 7 days later, she complained of dry cough, fatigue and fever up to 38.5°C. She was isolated at home and self-monitored blood oxygen saturation – which was always within normal range – and took acetaminophen. Symptoms gradually disappeared over 3 days, apart from cough that persisted for approximately 10 days. One week after symptom onset, she underwent nasopharyngeal swab for SARS-CoV2. On the same day, a blood test revealed a severe leukopenia with neutropenia and lymphopenia (leukocytes 1.19×10^9/L, granulocytes-neutrophils 0.75×10^9/L, lymphocytes 0.09×10^9/L), but no elevation of inflammatory markers. Two weeks after the first swab, the second one was negative and the patient was asymptomatic (Supplementary material).

Alemtuzumab causes the depletion of CD52-expressing cells, leading to a transient alteration in lymphocyte numbers, trafficking and function after each course, and thus to an increased risk of infection,[2,3] including both upper (very common; ⩾10%) and lower respiratory tract infections (common; 1%–10%).[4] The risk of COVID-19 in alemtuzumab-treated MS patients is unknown, but a higher risk is conceivable. For these reasons, Brownlee et al.[2] recently recommended that alemtuzumab should not be initiated in MS patients who are about to start a treatment, and, for those already on treatment, to delay further courses, considering the risks and benefits. We described the case of a young woman who had COVID-19 few days after alemtuzumab infusion. Her blood counts were in line with the study by Li et al.,[5] reflecting an intense immunosuppression. Nonetheless, the patient had a mild infection and recovered within 2 weeks. On one hand, it should be noted that being a young woman without other medical conditions probably decreases the risk that COVID-19 results in severe illness. On the other hand, our report highlights the possibility that mild courses of COVID-19 may exist despite immunosuppression and that the spectrum of illness severity does not necessarily follow patient's immune status. Further reports are needed to clarify the link between COVID-19 risk/severity/disease status and concomitant immunosuppressive medications.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship and/or publication of this article: A.M.P., M.A.D.R. and F.M.B. have received conference fees and compensation for travel grants from Genzyme, Merck-Serono, Biogen and Roche. T.C., L.S., M.P., A.A., G.G.F., D.G. and E.S. declare no potential conflicts of interest.

Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

ORCID iDs

Tiziana Carandini https://orcid.org/0000-0002-0568-7580
Anna Margherita Pietroboni https://orcid.org/0000-0003-1538-1830
Filippo Martinelli Boneschi https://orcid.org/0000-0002-9955-1368

Multiple Sclerosis Journal
1–2
DOI: 10.1177/1352458520926459

Supplemental material

Supplemental material for this article is available online.

References

1. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study. *Lancet* 2020; 395(10229): 1054–1062.
2. Brownlee W, Bourdette D, Broadley S, et al. Treating multiple sclerosis and neuromyelitis optica spectrum disorder during the COVID-19 pandemic. *Neurology*. Epub ahead of print 2020. DOI: 10.1212/WNL.0000000000009507.
3. Coles AJ, Twyman CL, Arnold DL, et al. Alemtuzumab for patients with relapsing multiple sclerosis after disease-modifying therapy: A randomised controlled phase 3 trial. *Lancet* 2012; 380(9856): 1829–1839.
4. Bianco A, Mari P-V, Larici AR, et al. Alemtuzumab-induced lung injury in multiple sclerosis: Learning from adversity in three patients. *Mult Scler Relat Disord* 2020; 37: 101450.
5. Li Z, Richards S, Surks HK, et al. Clinical pharmacology of alemtuzumab, an anti-CD52 immunomodulator, in multiple sclerosis. *Clin Exp Immunol* 2018; 194(3): 295–314.

***Tiziana Carandini*[1], *Anna Margherita Pietroboni*[1], *Luca Sacchi*[1,2], *Milena Alessandra De Riz*[1], *Mattia Pozzato*[1,2], *Andrea Arighi*[1], *Giorgio Giulio Fumagalli*[1], *Filippo Martinelli Boneschi*[1,2], *Daniela Galimberti*[1,2] *and Elio Scarpini*[1,2]**

[1]*Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy*

[2]*University of Milan, Milan, Italy*

Correspondence to:

T Carandini

Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Via Francesco Sforza 35, Milan 20122, Italy.

tizianacarandini@gmail.com