



Case report

Guillain-Barre syndrome 15 days after COVID-19 despite SARS-CoV-2 vaccination



Josef Finsterer

Klinik Landstrasse, Messerli Institute, Postfach 20, 1180, Vienna, Austria

ARTICLE INFO

Article history:

Received 2 July 2021

Received in revised form 10 July 2021

Accepted 10 July 2021

Keywords:

SARS-CoV-2

COVID-19

Polyradiculitis

Vaccination

Adverse reaction

Side effect

ABSTRACT

Guillain-Barre syndrome (GBS) following a SARS-CoV-2 vaccination has been repeatedly observed but GBS following a SARS-CoV-2 infection in a vaccinated patient has not been reported.

A 69yo female developed paresthesias of both lower and upper limbs which were followed by progressive muscle weakness. The history was positive for a mild SARS-CoV-2 infection 15 days earlier. COVID-19 occurred despite a first dose of a vector-based SARS-CoV-2 vaccine, 40 days prior to onset of GBS. Since CSF investigations and nerve conduction studies were indicative of GBS, subtype acute, inflammatory, demyelinating polyneuropathy (AIDP), immunoglobulins (30 g/d) were started. After two weeks complete recovery was achieved.

In conclusion, SARS-CoV-2 infections may develop despite full vaccination and may be complicated by GBS. Since no other trigger of GBS could be identified, a causal relation between the SARS-CoV-2 infection and GBS was suspected.

© 2021 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Though vaccinations with a SARS-CoV-2 vaccine are usually well tolerated, mild or severe adverse reactions, including neurological compromise, may occur in some cases [1]. Guillain-Barre syndrome (GBS) following a first or second dose of a SARS-CoV-2 vaccination has been previously reported [2–4]. It is also well-known that an infection with SARS-CoV-2 can be complicated by GBS [5]. However, GBS following a SARS-CoV-2 infection in a vaccinated patient has not been reported.

Case report

The patient is a 69 years-old Caucasian female who presented with stocking-type paresthesias of the lower limbs and of the dorsum manus followed by progressive muscle symmetric weakness of the lower more than the upper limbs since hospital day -1 (hd-1). Her previous history was positive for arterial hypertension, tension type headache since 6 years, and smoking. The history was further positive for vaccination with a first dose of a vector-based SARS-CoV-2 vaccine (AZ/Oxford) on hd-40. Immediately after vaccination she experienced headache for 2 days requiring acetyl-salicylic acid with paracetamol. Because of

tiredness, headache (VAS 9), congested nose, ageusia, and anosmia the patient underwent a SARS-CoV-2 PCR swab test on hd-15 which turned out positive. Most likely she got infected with the variant B.1.1.7. Due to the mild clinical manifestations she was quarantined for 10 days and on hd-5 a second PCR swab test was negative. Her home medication included diosmin (1000 mg/d), carvedilol (50 mg/d), ginkgo folium (80 mg/d), and occasionally acetyl-salicylic acid with paracetamol. Clinical exam on hospital day 1 (hd1) revealed sore neck muscles, diffuse, symmetric weakness of the upper limbs (M4-), symmetric diffuse weakness of the lower limbs (M4-) and generally reduced tendon reflexes. Vitals were normal. She was able to stand only with support or holding herself with her hands. Blood tests revealed leukopenia of 1.1 G/L (n, 3.6–10.5 G/L) due to neutropenia but lymphocytosis, mild hyponatremia and hypocalcemia, and slightly increased D-dimer. A CT scan of the brain revealed prominent cerebellar tonsils and prominent cavernous sinuses. Cerebro-spinal fluid (CSF) investigations were non-informative. PCR tests for viruses and bacteria in the CSF were all negative. A PCR swab test for SARS-CoV-2 was negative. CSF was not tested for SARS-CoV-2. On hd2 quadraparesis had slightly increased and she additionally complained about hypoesthesia of the tongue tip. Intravenous immunoglobulins (IVIGs) were started on hd2 without imminent effect. Nerve conduction studies revealed proximal neuropathy and demyelination why GBS was classified as acute, inflammatory, demyelinating polyneuropathy (AIDP). She markedly improved

E-mail address: fifigs1@yahoo.de (J. Finsterer).

during the following days with complete recovery two weeks after onset. At discharge from hospital, the patient refused to receive the second dose of the vaccine.

Discussion

The presented patient is the first reported case in whom a SARS-CoV-2 infection, which was mild, developed despite having been vaccinated and was complicated by GBS of the AIDP type. Whether there was a causal relation between the SARS-CoV-2 infection and GBS respectively the SARS-CoV-2 vaccination and GBS remains speculative. Arguments for a causal relation between the SARS-CoV-2 infection and GBS are that this association has been previously reported [5] and that GBS followed the infection time-linked two weeks after the infection. GBS as a complication of an infection with SARS-CoV-2 is increasingly recognised and the increasing number of patients reported, suggests a causal relation. In a recent review, 220 patients with SARS-CoV-2 associated GBS have been reported as per the end of December 2020 [5]. In this study all ages were affected and there was male preponderance [5]. Latency between onset of COVID-19 and GBS ($n = 194$) ranged from -10 days to $+90$ days. The most frequent GBS subtype was AIDP ($n = 118$), followed by AMAN ($n = 13$), and AMSAN ($n = 11$) [5]. Therapy included IVIGs ($n = 191$), plasmapheresis ($n = 15$), or steroids ($n = 2$) [5]. The most frequent outcome was partial recovery ($n = 119$), followed by complete recovery ($n = 37$), and death ($n = 12$) [5]. Since then several other patients with SARS-CoV-2 associated GBS have been published. CSF is usually negative for SARS-CoV-2 in SARS-CoV-2 associated GBS patients. Recently, however, the first patient with COVID-19 GBS and SARS-CoV-2 positivity in the CSF has been reported [6].

The reason why the index patient got infected despite vaccination remains elusive but protection rates $<100\%$ have been reported for most of the vaccines. Currently, there is no evidence that false application of the vaccine or a defective vaccine dose were responsible for the vaccination failure. There were no indications for immune-suppression as the patient did not take immunosuppressive drugs and her history was negative for immunological disorders. Most likely, vaccination with only the first dose was responsible for the insufficient protection against the virus. Whether the SARS-CoV-2 vaccination favoured the development of GBS requires further studies.

Overall, SARS-CoV-2 infections may develop despite vaccination and may be complicated by GBS. Since no other trigger of GBS could be identified, a causal relation between the SARS-CoV-2 infection and GBS was suspected. In single cases, SARS-CoV-2

vaccination may be ineffective and followed by mild COVID-19, which itself may be complicated by severe neurological disease.

Funding

None.

Ethical approval

Was in accordance if ethical guidelines.

Consent

Was obtained.

Author contribution

JF: design, literature search, discussion, first draft, critical comments, final approval.

Author statement

The study was approved by the institutional review board.

Declaration of Competing Interest

The authors report no declarations of interest.

Acknowledgement

None.

References

- [1] Finsterer J, Scorza FA. SARS-CoV-2 vaccines are not free of neurological side effects. *Acta Neurol Scand* 2021 (in press).
- [2] Ogbebor O, Seth H, Min Z, Bhanot N. Guillain-Barré syndrome following the first dose of SARS-CoV-2 vaccine: a temporal occurrence, not a causal association. *IDCases* 2021;24:e01143.
- [3] Waheed S, Bayas A, Hindi F, Rizvi Z, Espinosa PS. Neurological complications of COVID-19: Guillain-Barre syndrome following Pfizer COVID-19 vaccine. *Cureus* 2021;13:e13426.
- [4] Finsterer J. Exacerbating Guillain-Barre syndrome eight days after vector-based COVID-19 vaccination. *Case Rep Infect Dis* 2021;13:19131.
- [5] Finsterer J, Scorza FA. Guillain-Barre syndrome in 220 patients with COVID-19. *Egypt J Neurol Psychiatr Neurosurg* 2021;57:55.
- [6] Araújo NM, Ferreira LC, Dantas DP, Silva DS, Dos Santos CA, Cipolotti R, et al. First report of SARS-CoV-2 detection in cerebrospinal fluid in a child with Guillain-Barré syndrome. *Pediatr Infect Dis J* 2021 (in press).