Open Journal of
Clinical & Medical
Case Reports

Volume 8 (2022)
Issue 08

ISSN: 2379-1039

Guillain-Barré syndrome following sinopharm COVID-19 vaccine: A case report

Mohammad Sadegh Fakhari; Leila Poorsaadat*; Behnam Mahmoodiyeh

***Corresponding Author: Leila Poorsaadat**

Department of Neurology, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

Tel: +9833685006, Fax: +988633686443; Email: leilamd@yahoo.com

Abstract

Coronavirus disease is a viral infectious disease which has spread worldwide since March 2020. This virus can affect different organs, resulting in various morbidities and mortality. Consequently, controlling the disease using vaccines is thought to be a preferred strategy. COVID-19 vaccines have brought many benefits but their adverse effects should not be ignored. Here, we report a case of Guillain-Barré Syndrome Following Sinopharm COVID-19 Vaccine.

Keywords

Coronavirus disease; Infectious disease.

Introduction

Coronavirus disease (COVID-19) an infectious disease caused by the SARS-CoV-2 virus has spread worldwide since March 2020, becoming one of the most serious causes of mortalities, especially among the elderly and patients with underlying diseases [1]. This virus can affect various organs including kidney, lung, and liver causing organ failure. Therefore, as a way of controlling the spread of COVID-19 virus, vaccination is known to be a good strategy [2]. So far, various types of vaccines of different companies have been developed and approved worldwide [3]. Along with the variety of benefits of vaccines, the side effects should be considered. COVID-19 vaccines can have a wide range of side effects including mild and common ones -like fever and myalgia- to more serious side effects including seizure, life threatening allergic reactions and thrombocytopenia [2]. Recently, probable association between COVID-19 vaccines and Guillain-Barré Syndrome (GBS) was reported by several researchers [4]. GBS is an autoimmune acute inflammatory demyelinating polyneuropathy which is usually evoked by an upper respiratory or gastrointestinal tract infection in two-thirds of patients, leading to ascending weakness of the limbs [6]. GBS has been reported following both COVID-19 infection and its vaccines [4,5]. The presented case, is one of the first reported cases of GBS after COVID-19 Sinopharm vaccine, in the absence of any other triggering factors. It is im-

portant to be aware of side effects of Sinopharm vaccine in form of GBS to avoid delayed treatment for the patients presenting with the same scenario.

Case Report

A 60-year-old Iranian man appears to Emergency Department (ED) at Valiasr hospital in Arak, complaining of progressive weakness and numbness of his extremities. He had a medical history of Hypertension and Hypothyroidism from years ago and was treated with Levothyroxine, Valsartan, Amlodipine, and Aspirin in advance. He reported a 3-weeks history of mild paresthesia of his fingertips which developed into weakness of both upper and lower distal extremities during this time. There was no recent history of fever, cough, shortness of breath, nausea, vomiting, diarrhea and there was no recent travel history. His family members were self-isolating and had no symptoms of COVID-19. He reported a history of taking three doses of Sinopharm Vaccine and the third dose was administered about 20-days before the onset of his symptoms.

On admission to ED he was afebrile, his blood pressure was 140/90 mmHg with a pulse rate of 90 bpm and normal oxygen saturation of 98% on room air. Neurologic physical examinations (including orientation, memory, cranial nerves, and cerebellar tests) were normal, apart from absent deep tendon reflexes (DTR) of lower limbs and reduced force of proximal and distal of his lower limbs. Examinations showed normal DTR and force of upper limb, normal muscle tone, and negative Babinski sign. There was no meningism, spinal cord sensory level, bladder or bowel involvement.

Investigations

Laboratory tests including Complete Blood Count, Electrolytes, Creatinine, Liver Function Tests were all normal, except for an Erythrocyte Sedimentation Rate of 36 mm/hour (reference range<10), a one-unit positive C-reactive Protein, and Creatine Phosphokinase of 695 units/liter (reference range: 24-195). Coombs Wright and 2-Mercaptoethanol were both negative for Brucellosis. Chest CT scan findings were normal, except for atelectasis in lung bases and Degenerative joint disease of the spine. MRI of the Brain, Cervical, Thoracic, and Lumbar Spine was reported normal. Echocardiography and Electrocardiography (ECG) did not show any pathologic finding. Lumbar puncture was not performed due to the patient's discontent. His neurophysiology study showed low amplitude sensory response and reduced amplitude of motor response in lower limb without any decrease in velocity. No abnormalities were observed in his electromyography since we had performed the test prior to development of the symptoms, during the first week after admission. Meeting five of seven domains of Brighton Criteria [7], diagnosis of GBS was confirmed, and the report of neurophysiology study is with Acute Motor-Sensory Axonal Neuropathy (AMSAN) variant of GBS.

Treatment

The patient was monitored in intensive care unit (ICU) for the first 3 days of hospitalization, and did not show any respiratory or swallowing dysfunction. He received intravenous immunoglobulin (IVIG) 0.4 g/kg daily for 5 days along with prophylaxis Heparin and Pantoprazole therapy and physiotherapy of his extremities. His symptoms subsided and were stabilized during hospitalization, and he did not require intubation.

Outcome and follow-up

The patient's motor symptoms began to improve subsequently to the first days of treating with IVIG. In 3 days after ICU admission, his signs and symptoms eased up and he was transferred to ward until his treatment was completed and at the sixth day of hospitalization, he was able to walk unassisted and was discharged on the seventh day.

Table 1: Neurophysiology results for the lower Limb.

A. Motor Nerve Conduction Studies (NCS)		F-Wave Latency (ms)	Latency (ms)	Amplitude (μV)	Conduction elocity (m/s)
Right Peroneal	Distal	38 (≤56)	5.6 (≤6.5)	0.9 (≥2)	44 (44)
	Proximal		13.8 (≤6.7)	1.4 (≥5)	
Right Tibial	Distal	-	4.9 (≤6.3)	5.1 (≥3)	46 (41)
	Proximal		15.4 (≤5.8)	1.9 (≥4)	
Left Peroneal	Distal	49 (≤56)	3.8 (≤6.5)	1.3 (≥2)	48 (44)
	Proximal		14.2 (≤6.7)	0.5 (≥5)	
Left Tibial	Distal	-	5.2 (≤6.3)	6.3 (≥3)	49 (41)
	Proximal		12.9 (≤5.8)	5.2 (≥4)	
A. **Sensory NCS**					
Right Sural		-	3.4 (≤4.4)	4 (≥6)	40 (≥40)
Left Sural		-	4 (≤4.4)	3 (≥6)	40 (≥40)

B. **Needle Electromyography**

Muscle	Spontaneous activity				Motor units				Recruitment
	Insertion	Fib	PSW	Fasc	Firing	Amp	Dur	Poly.	Pattern
Anterior Tibialis	None	None	None	None	3+	Normal	Normal	None	Discrete
Right gastrocnemius	None	None	None	None	3+	Normal	Normal	None	Discrete
Left gastrocnemius	None	None	None	None	3+	Normal	Normal	None	Discrete
Vastus Lateralis	None	None	None	None	3+	Normal	Normal	None	Discrete
Interpretation	Can be prolonged in denervation	Few Fibs and PSW can be normal but profuse in complete denervation		Can be present in normal muscle denervation	Rapid firing in denervation	Can be normal in acute nerve lesions			Full interference in healthy muscle Discrete recruitment in denervation as more motor units drop out

Table 2: Neurophysiology results for the upper Limb.

A. Motor Nerve Conduction Studies (NCS)		Latency (ms)	Amplitude (μV)	Conduction Velocity (m/s)
Right Median	Distal	4 (≤4.4)	4.3 (≥4)	55 (≥49)
	Proximal	8.9 (≤4.4)	4.9 (≥4)	
Right Ulnar	Distal	3.2 (≤3.3)	8.2 (≥6)	59 (≥49)
	Proximal	7.8 (≤4.5)	8 (≥7)	
Left Median	Distal	3.7 (≤4.4)	4.1 (≥4)	60 (≥49)
	Proximal	8.5 (≤4.4)	3.9 (≥4)	
B. **Sensory NCS**				
Right Median		2.1 (≤3.5)	24 (≥20)	60 (≥50)
Right Ulnar		1.9 (≤3.1)	26 (≥17)	55 (≥50)
Left Median		2 (≤3.5)	25 (≥20)	63 (≥50)

X. **Needle Electromyography**

Muscle	Spontaneous activity				Motor units				Recruitment
	Insertion	Fib	PSW	Fasc	Firing	Amp	Dur	Poly.	Pattern

Right Flexor Carpi Ulnaris	None	None	None	None	3+	Normal	Normal	None	Discrete
Left Flexor Carpi Ulnaris	None	None	None	None	3+	Normal	Normal	None	Discrete
Right Biceps Brachii	None	None	None	None	3+	Normal	Normal	None	Discrete
Left Biceps Brachii	None	None	None	None	3+	Normal	Normal	None	Discrete
Interpretation	Can be prolonged in denervation	Few Fibs and PSW can be normal but profuse in complete denervation		Can be present in normal muscle denervation	Rapid firing in denervation	Can be normal in acute nerve lesions			Full interference in healthy muscle Discrete recruitment in denervation as more motor units drop out

Discussion

Due to severe consequences, it is vital to diagnose and treat GBS with no delay. Symptoms like paresthesia and difficulty in moving after COVID-19 vaccination should not be missed, since there have been several reports of patients presenting with the same symptoms after vaccination. GBS has been reported to occur following various types of Covid-19 vaccines so far [8], however, to the author's awareness, GBS symptoms following Sinopharm COVID-19 vaccine have been reported infrequently.

Sinopharm COVID-19 vaccine presents a dead copy of the virus to the body by a two-dose schedule, followed by a third booster dose after a period of at least 3 months. Dead antigens of the virus introduced to the immune system, bring about antibodies and prepare the immune system for further attacks by virus. In August 2020, trials of this vaccine were completed and showed activation of neutralizing antibody response as a result of vaccine injection with low rates of adverse reactions. The most common adverse effects were pain at the injection site and fever which were all mild and required no treatment [9].

Confirming post-vaccination GBS diagnosis, requires the absence of other etiologies and beginning symptoms within 6 weeks after receiving the vaccine [10]. The pathophysiological mechanism of post-vaccination and post-infectious GBS is thought to be the same, as a delayed immune-mediated reaction unveiled by the activation of T-cells which cross-react to both viral antigen and a myelin protein, causing clinical manifestations of GBS [11,12].

Our case did not report any symptoms nor did our investigations raise any doubt about the etiology of GBS except for a history of Sinopharm COVID-19 vaccination. Meticulous post-vaccination observation and reporting system would clarify the relationship between different types of COVID-19 vaccines and GBS.

Declarations

Ethical Approval and consent to participate: A written informed consent was obtained from the participants. Authors confirm that all methods were performed in accordance with institutional ethical standards and the Declaration of Helsinki.

Consent for publication: Not applicable

Availability of data and materials: All data are available from the corresponding author on reasonable request.

Competing interests: All the authors declared no conflict of interest.

Funding: This article was no funded by any individual or organization.

Authors' contributions: Study conception and design MSF, LP, BM. Data collection, statistical expertise, analysis and interpretation of data: MSF, LP, BM. Manuscript preparation, supervision, administrative support and critical revision of the paper: MSF, LP. All authors read and approved the final manuscript.

References

1. Zhao J, Zhao S, Ou J, Zhang J, Lan W, Guan W, et al. COVID-19: coronavirus vaccine development updates. Frontiers in immunology. 2020; 11: 3435.

2. Teijaro JR, Farber DL. COVID-19 vaccines: modes of immune activation and future challenges. Nature Reviews Immunology. 2021; 21: 195-7.

3. Freeman D, Loe BS, Yu L-M, Freeman J, Chadwick A, Vaccari C, et al. Effects of different types of written vaccination information on COVID-19 vaccine hesitancy in the UK (OCEANS-III): A single-blind, parallel-group, randomised controlled trial. The Lancet Public Health. 2021; 6: e416-e27.

4. Karimi N, Boostani R, Fatehi F, Panahi A, Okhovat AA, Ziaadini B, et al. Guillain-Barre Syndrome and COVID-19 Vaccine: A Report of Nine Patients. Basic and Clinical Neuroscience Journal. 2021; 12: 703-10.

5. Uncini A, Vallat J-M, Jacobs BC. Guillain-Barré syndrome in SARS-CoV-2 infection: an instant systematic review of the first six months of pandemic. Journal of Neurology, Neurosurgery & Psychiatry. 2020; 91: 1105-10.

6. Hughes RA, Rees JH. Clinical and epidemiologic features of Guillain-Barré syndrome. The Journal of infectious diseases. 1997; 176: S92-8.

7. Fokke C, van den Berg B, Drenthen J, Walgaard C, van Doorn PA, Jacobs BC. Diagnosis of Guillain-Barré syndrome and validation of Brighton criteria. Brain: A journal of neurology. 2014; 137: 33-43.

8. Lahoz Fernandez PE, Miranda Pereira J, Fonseca Risso I, Baleeiro Rodrigues Silva P, Freitas Barboza IC, Vieira Silveira CG, et al. Guillain-Barre syndrome following COVID-19 vaccines: A scoping review. Acta neurologica Scandinavica. 2022; 145: 393-8.

9. Xia S, Duan K, Zhang Y, Zhao D, Zhang H, Xie Z, et al. Effect of an inactivated vaccine against SARS-CoV-2 on safety and immunogenicity outcomes: interim analysis of 2 randomized clinical trials. Jama. 2020; 324: 951-60.

10. Park Y-S, Lee K-J, Kim SW, Kim KM, Suh BC. Clinical features of post-vaccination Guillain-Barré syndrome (GBS) in Korea. Journal of Korean medical science. 2017; 32: 1154-9.

11. Introna A, Caputo F, Santoro C, Guerra T, Ucci M, Mezzapesa DM, et al. Guillain-Barré syndrome after AstraZeneca COVID-19-vaccination: A causal or casual association? Clinical neurology and neurosurgery. 2021; 208: 106887.

12. Willison HJ, Jacobs BC, van Doorn PA. Guillain-Barré syndrome. Lancet (London, England). 2016; 388: 717-27.

Manuscript Information: Received: May 02, 2022; Accepted: Jun 17, 2022; Published: Jun 30, 2022

Authors Information: Mohammad Sadegh Fakhari[1]; Leila Poorsaadat[2]*; Behnam Mahmoodiyeh[3]

[1]Student Research Committee, Arak University of Medical Sciences, Arak, Iran.

[2]Department of Neurology, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

[3]Department of Anesthesiology, School of Medicine, Arak University of Medical Sciences, Arak, Iran.

Citation: Fakhari MS, Poorsaadat L, Mahmoodiyeh B. Guillain-Barré syndrome following sinopharm COVID-19 vaccine: A case report. Open J Clin Med Case Rep. 2022; 1868.