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Guillain-Barre Syndrome Post COVID-19 Vaccination: Case Report

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Abstract: Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) started to evolve from cluster of cases to spread around the world causing the Coronavirus disease 2019 (COVID-19) pandemic. By the end of 2020 U.S. Food and Drug approved Pfizer-BioNTech (COMIRNATY) as one of the first approved vaccine and it utilizes messenger RNA (mRNA) to triggers an immune response to mitigate the actual infection effect. The reported common side effects such as mild local pain at the site of injection, headache, muscle ache, joint pain, and fever. Herein, we report the two cases from Saudi Arabia, who were diagnosed as having Guillain-Barre syndrome post COVID-19 vaccination. The two patients presented to the Emergency Room of the Security Forces Hospital Program with chief complain of weakness which started by affecting their lower limbs bilaterally followed by both upper limb weakness. The patients were satisfying the clinical criteria of Guillain-Barré syndrome. One of the patients was having reduced vital capacity and was unable to clear his secretion so intubation was made to protect the airway. The patients were started on Intravenous immunoglobulins 0.4 g/kg infusion daily for five days. They were also started on sessions of physiotherapy. The patient's condition improved markedly and rapidly after receiving the IV immunoglobulins It is critically important for health care workers to rapidly recognize neurological complications and other side effects associated with COVID-19 vaccination.

Keywords: Guillain-Barre Syndrome, mRNA, Saudi Arabia, COVID-19, Pfizer-BioNTech, Pandemic, Vaccination

1. Introduction

In December 2019, the crown-like spikes viruses on their outer surface Coronaviruses comprising Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) started to evolve from cluster of cases to spread around the world causing the Coronavirus disease 2019 (COVID-19) pandemic [1].

The symptoms were variable ranging from mild fever, easy fatigability, and loss of taste towards fatality from the virus [2].

Soon after the of the pandemic multiple clinical trials embarked with aim to develop solutions for the mortality and morbidity caused by the COVID-19 and nearly one years later by the end of 2020 U.S. Food and Drug Administration (FDA) approved vaccination from different manufacturers.

Pfizer-BioNTech (COMIRNATY) was one of the first approved vaccine and it utilizes messenger RNA (mRNA) to triggers an immune response to mitigate the actual infection effect.

To date, approximately 47 million doses of the vaccines from different manufactures were giving in the kingdom and the reported common side effects such as mild local pain at the site of injection, headache, muscle ache, joint pain, and fever [3].

Anaphylaxis, thrombosis with thrombocytopenia syndrome myocarditis and pericarditis were among the rare side effects encountered by the vaccine recipients.

A rarer presentation and side effect of COVID-19 disease

and vaccination from different companies is Guillain–Barré syndrome (GBS) [4].

Herein, we report two cases of a 33- and 27-years old males, from Saudi Arabia, who were diagnosed as having Guillain-Barre syndrome post COVID-19 vaccination.

2. Case Report

2.1. Patient Information

The patient is a 33-year-old Saudi male who has no prior medical or surgical illnesses working in a vaccination center. He received Pfizer-BioNTech vaccine in January 2021 of two doses and the second dose was on 24 January 2021 without developing any side effects.

2.2. Clinical Findings

The patient presented to the Emergency Room of the Security Forces Hospital Program on April 2021 with chief complain of weakness which started by affecting his lower limbs bilaterally followed by both upper limb weakness over span of 3 days.

He gave no history of any flu-like illness prior to the presentation with no history of diarrhea headache or muscle pain.

He only has a history of receiving COVID-19 vaccine (Pfizer-BioNTech) about three months prior to presentation to the hospital.

2.3. Diagnostic Assessment

On examination, the patient was conscious and alert with normal mental status and speech. The cranial examination was unremarkable, and no noticeable facial weakness or asymmetry was appreciated. Motor examination revealed normal bulk and tone in bilateral upper and lower limbs. Power in both upper limbs were 4/5 and were significantly reduced in his both lower limbs with power of 2/5 with absent deep tendon reflexes. He was unable to walk. Forced vital capacity was normal.

Routine labs were unrevealing. COVID-19 PCR was negative (Table 1). Computed tomography (CT) scan and magnetic resonance imaging (MRI) of the brain were normal (figure 1).

The patient was satisfying the clinical criteria of Guillain-Barré syndrome, which is ascending weakness with absent deep tendon reflexes and this diagnosis was confirmed by conduction study, which showed clear evidence of conduction delay (showed absent F-wave and markedly low amplitude) and radiculopathy, which supports the diagnosis.

Table 1. *Laboratory test.*

Lab	Result	Normal value
Complete blood count		
WBC (10X9/L)	5.32	4.5-13.5
RBC (10X12/L)	4.10	3.8-6.5
HGB G/L	120.0	11.5-180
HCT %	0.364	0.35-0.52
MCV FL	88.8	77-98
MCHC G/L	330.0	310-360
PLT	206	150-400
Inflammatory markers		
ESR MM/HR	13	0-20
CRP	7	Less 5.0
Electrolytes		
NA MMOL/L	138	136-145
K MMOL/L	4.3	3.5-5.1
UREA MMOL/L	2.0	2.76-8.07
CR UMOL/L	44	62-106
Lactic acid dehydrogenase		
LDH U/L	494	135-225
Hepatitis panel		
HBsAG Qual (S/N)	Negative	Negative
HEP A IgM Ab	Negative	Negative
HEPATITIS Bc IGM	Negative	Negative
HEP C VIRUS Ab (S/co)	Negative	Negative
Human immunodeficiency virus		
HIV 1, HIV 2 Ab	Negative	Negative
Brucella serology		
Brucella serology	Negative	Negative
Antinuclear antibody		
ANA	Negative	Negative
Anti-smooth muscle antibody		
Anti-smooth muscle antibody	Negative	Negative
Antiganglioside antibodies		
Antiganglioside antibodies	Negative	Negative
Coagulation profile		
PT SEC	14.2	10.0-14.1
INR	1.23	0.86-1.2
APTT SEC	38.9	24.6-40.1

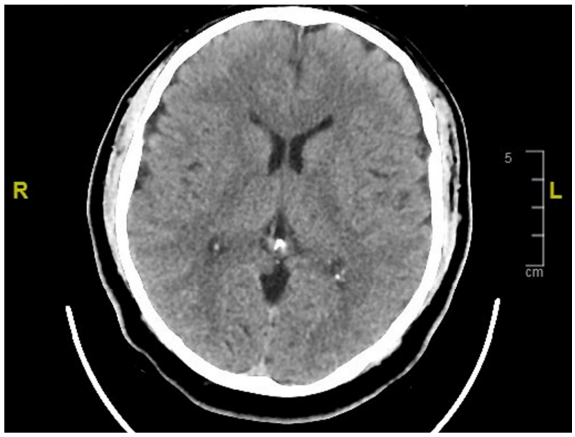

Figure 1. *Axial CT image of the brain shows No evidence of acute well-established territorial ischemic changes.*

2.4. Therapeutic Intervention

The patient was started on Intravenous immunoglobulins 0.4 g/kg infusion daily for five days. He was also started on sessions of physiotherapy.

2.5. Follow-up and Outcomes

The patient's condition improved markedly and rapidly after receiving the IV immunoglobulins. He had regained power in both upper and lower limbs and started to mobilize without support. On the 3rd of May 2021, the patient was doing well and was discharged home in stable condition.

3. Patient Information

The second patient is a 27-year-old Saudi male who is free from medically surgical illnesses working as military personal. He received Pfizer-BioNTech vaccine in 10 days prior to his presentation.

3.1. Clinical Findings

Following the recipient of the vaccine the patient started to have sore throat, hoarseness followed by difficulty in swallowing solid food.

Soon after the patient started to have weakness affecting his lower limbs followed by progression the weakness in an ascending fashion with involvement of his respiratory muscles in form of inability of handling his secretion over span of 2 days.

He only has a history of receiving COVID-19 vaccine (Pfizer-BioNTech) 10 days prior to presentation to the hospital.

3.2. Diagnostic Assessment

On examination, the patient was conscious and alert with normal mental status and speech. The cranial examination initially was unremarkable, and no noticeable facial weakness or asymmetry were noted. Motor examination revealed normal bulk and tone in bilateral upper and lower limbs. Power in both upper and lower limbs were significantly reduced with power of 2/5 with absent deep tendon reflexes.

Routine labs were unrevealing. COVID-19 PCR was negative (Table 2), and his cerebrospinal fluid (CSF) analysis and cultures were within normal limits (Table 3). CT scan and MRI of the brain were normal.

Table 2. *Laboratory test.*

Lab	Result	Normal value
Complete blood count		
WBC (10X9/L)	5.32	4.5-13.5
RBC (10X12/L)	4.10	3.8-6.5
HGB G/L	120.0	11.5-180
HCT %	0.364	0.35-0.52
MCV FL	88.8	77-98
MCHC G/L	330.0	310-360
PLT	206	150-400
Inflammatory markers		
ESR MM/HR	13	0-20
CRP	7	Less 5.0
Electrolytes		
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K MMOL/L	4.3	3.5-5.1
UREA MMOL/L	2.0	2.76-8.07
CR UMOL/L	44	62-106
Lactic acid dehydrogenase		
LDH U/L	494	135-225
Hepatitis panel		
HBsAG Qual (S/N)	Negative	Negative
HEP A IgM Ab	Negative	Negative
HEPATITIS Bc IGM	Negative	Negative
HEP C VIRUS Ab (S/co)	Negative	Negative
Human immunodeficiency virus		
HIV 1, HIV 2 Ab	Negative	Negative
Brucella serology		
Brucella serology	Negative	Negative
Antinuclear antibody		
ANA	Negative	Negative
Anti-smooth muscle antibody		
Anti-smooth muscle antibody	Negative	Negative
Antiganglioside antibodies		
Antiganglioside antibodies	Negative	Negative
Coagulation profile		
PT SEC	14.2	10.0-14.1
INR	1.23	0.86-1.2
APTT SEC	38.9	24.6-40.1

Table 3. *Cerebrospinal fluid (CSF) analysis and cultures.*

Lab	Result	Normal value
Cerebrospinal fluid analysis		
Pressure (cmH2O)	206	5-20
Appearance	Clear	Clear
WBC	0	0-3
Glucose (mmol/L)	3.1	2.5-3.5
Protein g/L	120.0	0.18-0.45
Cerebrospinal cultures		
Culture	No growth	No growth
Gram stain	Normal	Normal

During his first day in the hospital the patient started to have reduced vital capacity and was unable handle his own secretion, elective intubation was done to maintain his airway.

The patient was satisfying the Brighton criteria of Guillain-Barré syndrome, which is ascending weakness with absent deep tendon reflexes and absence of alternative diagnosis of the weakness.

3.3. Therapeutic Intervention

The patient was intubated and was giving Intravenous immunoglobulins 0.4 g/kg infusion daily for five days. He was also started on physiotherapy sessions.

3.4. Follow-up and Outcomes

After a week of intubation, the patient showed improvement in the muscle power. A trial was made for extubating, which was successful. Gradually, the patient showed progressive improvement in the muscle power. He started to mobilize independently, and his power improved from 2/5 upon admission and became 4/5 in both upper and lower limbs. He is still on nasogastric tube feeding as his dysphagia persisted and his speech has a nasal tone.

4. Discussion

Guillain–Barré syndrome (GBS) is an inflammatory polyradiculoneuropathy classically manifested as an acute-onset ascending sensorimotor paralysis with global incidence of a1–2 per 100,000 person-years [5]. Data on GBS

prevalence from Saudi Arabia is limited [6]. However, recently published retrospective multicenter study that included 156 patients with male to female ratio of 2.4:1 [7].

The clinical presentation of the disease begins with loss of sensation and motor weakness in the lower limbs in ascending fashion to involve the upper limbs and eventually involvement of the cranial nerves. Apart from this classical presentation different distinct clinical variants are present [8].

The pathogenesis is not fully understood and is thought to be the end-result of the body immune response to infections with subsequent damage to peripheral nerves [9].

GBS usually occur several days or weeks after an infectious process which commonly affect the gastrointestinal or respiratory system [10].

Vaccinations have also been associated GBS. It has been reported following the recipients of different vaccines in period from 2 days to 3 weeks [11, 12].

GBS associated with COVID-19 vaccination is being increasingly reported from different countries; the rate of reporting varies among different COVID-19 vaccine manufacturers of both types of mRNA and adenovirus [13-16].

The exact pathogenesis is still unknown, but it is fair to link it to the immune response as with other forms of infection and vaccines [17].

Our patient meets the clinical criteria of diagnosis GBS and was treated with the recommended medication with favorable response for the patient many in other reported cases [18-19].

5. Conclusion

It is crucial for health care workers to rapidly identify neurological complications and other side effects associated with COVID-19 vaccination. Continuing vigilance is required, and rapid recognition of such complication is crucial to offer the best medical treatment in the shortest time. Further observational studies are required to define a solid causal relationship. To our knowledge, this case presented is the first report in Saudi Arabia.

List of Abbreviation

Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV)

Coronavirus disease 2019 (COVID-19)

Messenger RNA (mRNA)

Computed tomography (CT)

Magnetic resonance imaging (MRI)

Guillain–Barré syndrome (GBS)

Declarations

Ethics approval and consent to participate:

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

References

[1] Wang D, Hu B, Hu C, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus–Infected Pneumonia in Wuhan, China. *JAMA*. 2020; 323 (11): 1061-1069. Doi: 10.1001/jama.2020.1585.

[2] Hu B, Guo H, Zhou P, Shi Z-L. Characteristics of SARS-CoV-2 and COVID-19. *Nat Rev Microbiol*. 2021; 19 (3): 141-154. doi: 10.1038/s41579-020-00459-7.

[3] Pfizer-BioNTech COVID-19 Vaccine. US food & drug administration website. U.S. Food & Drug Administration. Accessed November 28, 2021. https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-COVID-19/pfizer-biontech-COVID-19-vaccine%0A.

[4] Khan F, Sharma P, Pandey S, et al. COVID-19-associated Guillain-Barre syndrome: Postinfectious alone or neuroinvasive too? *J Med Virol*. 2021; 93 (10): 6045-6049. doi: 10.1002/jmv.27159.

[5] Leonhard SE, Mandarakas MR, Gondim FAA, et al. Diagnosis and management of Guillain–Barré syndrome in ten steps. *Nat Rev Neurol*. 2019; 15 (11): 671-683. doi: 10.1038/s41582-019-0250-9.

[6] Benamer HTS, Bredan A. Guillain-Barré syndrome in Arab countries: a systematic review. *J Neurol Sci*. 2014; 343 (1-2): 221-223. doi: 10.1016/j.jns.2014.05.065.

[7] Alanazy MH, Bakry SS, Alqahtani A, et al. Clinical features and outcome of Guillain-Barre syndrome in Saudi Arabia: a multicenter, retrospective study. *BMC Neurol*. 2021; 21 (1): 275. doi: 10.1186/s12883-021-02314-5.

[8] Willison HJ, Jacobs BC, van Doorn PA. Guillain-Barré syndrome. *Lancet (London, England)*. 2016; 388 (10045): 717-727. doi: 10.1016/S0140-6736(16)00339-1.

[9] Yuki N. Infectious origins of, and molecular mimicry in, Guillain-Barré and Fisher syndromes. *Lancet Infect Dis*. 2001; 1 (1): 29-37. doi: 10.1016/S1473-3099(01)00019-6.

[10] Hughes RAC, Cornblath DR. Guillain-Barré syndrome. *Lancet (London, England)*. 2005; 366 (9497): 1653-1666. doi: 10.1016/S0140-6736(05)67665-9.

[11] Schonberger LB, Bregman DJ, Sullivan-Bolyai JZ, et al. Guillain-Barre syndrome following vaccination in the National Influenza Immunization Program, United States, 1976--1977. *Am J Epidemiol*. 1979; 110 (2): 105-123. doi: 10.1093/oxfordjournals.aje.a112795.

[12] Chen Y, Zhang J, Chu X, Xu Y, Ma F. Vaccines and the risk of Guillain-Barré syndrome. *Eur J Epidemiol*. 2020; 35 (4): 363-370. doi: 10.1007/s10654-019-00596-1.

[13] Patone M, Handunnetthi L, Saatci D, et al. Neurological complications after first dose of COVID-19 vaccines and SARS-CoV-2 infection. *Nat Med*. Published online 2021. doi: 10.1038/s41591-021-01556-7.

[14] Shapiro Ben David S, Potasman I, Rahamim-Cohen D. Rate of Recurrent Guillain-Barré Syndrome After mRNA COVID-19 Vaccine BNT162b2. *JAMA Neurol*. 2021; 78 (11): 1409-1411. doi: 10.1001/jamaneurol.2021.3287.

[15] Shao S-C, Wang C-H, Chang K-C, Hung M-J, Chen H-Y, Liao S-C. Guillain-Barré Syndrome Associated with COVID-19 Vaccination. *Emerg Infect Dis*. 2021; 27 (12): 3175-3178. doi: 10.3201/eid2712.211634.

[16] Osowicki J, Morgan H, Harris A, Crawford NW, Buttery JP, Kiers L. Guillain-Barré Syndrome in an Australian State Using Both mRNA and Adenovirus-Vector SARS-CoV-2 Vaccines. *Ann Neurol*. 2021; 90 (5): 856-858. doi: https://doi.org/10.1002/ana.26218.

[17] Haber P, Sejvar J, Mikaeloff Y, DeStefano F. Vaccines and Guillain-Barré syndrome. *Drug Saf*. 2009; 32 (4): 309-323. doi: 10.2165/00002018-200932040-00005.

[18] 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 (2): e13426-e13426. doi: 10.7759/cureus.13426.

[19] Rao SJ, Khurana S, Murthy G, Dawson ET, Jazebi N, Haas CJ. A case of Guillain-Barre syndrome following Pfizer COVID-19 vaccine. *J community Hosp Intern Med Perspect*. 2021; 11 (5): 597-600. doi: 10.1080/20009666.2021.1954284.