

## Case Report

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## Guillain-Barré Syndrome After Receiving Sputnik Light COVID-19 Vaccine: A Case Report from Palestine

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### ABSTRACT

We present this case of a 50-year-old man with no previous history of COVID-19 infection or recent viral or bacterial infections who presented as a case of Guillain-Barre syndrome 10 days after he received the COVID-19 vaccination.

The diagnosis has been made on the basis of physical examination, magnetic resonance imaging (MRI) of the spine, cerebrospinal fluid (CSF) analysis, and electromyography (EMG). The reported cases of GBS following vaccination supported the theory of molecular mimicry as an underlying pathophysiology for this disorder. However, research has not yet identified the exact mechanism at the molecular level.

In the best of our knowledge, this is the first case from Palestine to be reported. We hope that our report will encourage further research on this issue and warn medical professionals to consider GBS as a possible diagnosis in patients who present with acute flaccid paralysis (AFP) after vaccination with COVID19.

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### Introduction

Guillain-Barré syndrome (GBS) is an immune-mediated peripheral neuropathy characterized by rapidly progressive, ascending paralysis with hyporeflexia. This syndrome was reported following meningococcus, polio, influenza and rabies vaccines. However, there is no well-established relation with the COVID-19 vaccine yet. Clinical features include bilateral leg weakness that ascends to arms, respiratory muscles face and may progress to generalized flaccid paralysis. Distal paresthesias (hand or foot tingling) are common, Decreased or absent reflexes and autonomic disturbances can also occur.

Diagnosis is based on clinical features, cerebrospinal fluid testing, and nerve conduction studies. Patients should be hospitalized for multidisciplinary supportive care and monitoring for respiratory and autonomic complications. Plasmapheresis has been shown to improve short-term and long-term results, and intravenous immunoglobulin has been shown to accelerate recovery in adults and children.

About 3 percent of patients with Guillain-Barré syndrome die. Neurologic problems persist in up to 20 percent of patients with the disease, and one-half of these patients are severely disabled. Nevertheless, the benefit of vaccines in preventing disease and decreasing morbidity and mortality should be weighed against

### Case Presentation

A 50-year-old male patient with a medical history of Hypertension, referred to the Department of Internal Medicine of Al-Ahli Hospital with 10 days history of sudden onset progressive bilateral lower limb weakness and paresthesia that started from the tips of all toes and extended proximally up to the knees.

The patient was in his usual state of health, and there was no recent history of trauma, fever, and upper respiratory or gastrointestinal tract illnesses. He had received the COVID-19 vaccine (Sputnik Light) 2 weeks before the start of his symptoms. COVID-19 in particular has never been diagnosed in this patient. The patient denied any history of visual disturbances, difficulty in swallowing, speaking, or chewing. There was no weight loss, night sweats or change in bowel habits. There was no history of loss of consciousness, headaches, urine or stool incontinence.

On physical examination, the patient had stable vital signs, afebrile and on room air with no signs of respiratory distress. Examination of the Nervous system showed decreased sensation in both upper and lower limbs. Motor strength grade was 5/5 in upper extremities and 3/5 in both lower extremities, proximally and distally. There was paresthesia in the tips of all fingers and toes. The patient was not able to stand or maintain sitting position without support. His reflexes were absent in both ankles and knees, and normal in the upper limbs, plantar reflexes were negative. Cerebellar signs and

Meningeal Signs were both negative.

Cranial Nerves examination and examination of other systems were both unremarkable. Initial investigations showed normal leukocyte count of  $8.992 \times 10^3/\mu\text{L}$  (reference range  $5-10 \times 10^3/\mu\text{L}$ ), normal hemoglobin and platelet count. Serum Electrolytes were within the normal ranges. His kidney, liver and coagulation profile were normal. C-reactive protein was normal. Serum TSH and Vitamin B12 levels were also normal. A nasopharyngeal swab for COVID-19 PCR from was also negative. Serum antibodies to SARS-COV-2 were within the normal range.

MRI of the whole spine showed D11/12 diffuse posterior disc bulge indenting the dural sac ventrally, L4/5 mild diffuse posterior disc bulge gently touching the dural sac ventrally, no soft tissue lesions or inflammatory changes.



**Figure 1:** Spine magnetic resonance Imaging showing posterior disc bulging of D11/12 and L3/4 (black arrows).

Brain MRI was negative for inflammatory changes in the cerebellum and brainstem. A lumbar puncture was performed, and cerebrospinal fluid analysis showed normal glucose in addition to normal white and red blood cell counts. Additionally, CSF analysis showed high protein at 320 mg/dL (reference range 45-1000 mg/dL) and elevated albumin at 390 mg/L (reference range 0-350 mg/L). Gram stain and culture of the CSF were both negative. Nerve conduction study showed findings consistent with reduced nerve conduction velocity and local conduction blocks.

Based on the previous work up and the patient's presentation, the diagnosis of GB was made clinically as well as with lumbar puncture (LP) and neurophysiology studies. The patient had stable serial respiratory examinations. Throughout his stay in the hospital, he was maintained on Esomeprazole 40mg PO, Enalapril 10mg PO, Enoxaparin Sodium 40mg S.C, Methylprednisolone 1g IV and Duloxetine 30mg PO.

The patient had received five sessions of Plasmapheresis in 10 days, after which he showed signs of improvement in ambulation and overall function with a motor power of 5 proximally and distally of both upper and lower limbs. He tolerated Plasmapheresis without experiencing any side effects. He also received Physiotherapy sessions for gait training, range of motion exercises, as he remained stable and responded well; he was discharged in good general condition when he started to walk with mild support by a walker device.

## Discussion

The first case of GBS following COVID-19 vaccination was reported in February 2021 in the USA in an elderly female who presented 2 weeks after the first dose of the vaccine. The patient presented with fatigue and bilateral symmetric weakness of the lower limbs. CSF analysis showed an increased total protein concentration with normal total nucleated cell count and she was started on IVIG which led to improvement in the weakness. The patient recovered successfully and was discharged to a rehabilitation institute thereafter [1].

With the increased number of received COVID-19 vaccinations, there were increased reports of the side effects of the vaccine, including systemic and local manifestations and asymptomatic laboratory abnormalities. The U.S. Food and Drug Administration recently issued a warning that the single-dose vaccine is associated with an increased risk of developing Guillain-Barré syndrome (GBS).

In the U.S., an estimated number of 146 million fully vaccinated people have received either the Moderna or Pfizer COVID-19 vaccines (both of which require two doses). To date, the FDA has not seen a statistical increase in GBS in patients who received the Moderna and Pfizer COVID-19 vaccines.

Among the various side effects reported for different vaccines, neurological events can be among the most severe and thus of most concern. The potential association of vaccines and GBS was first brought to attention in 1976, following an influenza outbreak among new US Army recruits, which prompted the development of a new vaccine, and a mass vaccination campaign throughout the USA, due to fears of a possible influenza pandemic similar to that seen in the Spanish Flu in 1918. Several cases of GBS were noted to be reported once the vaccination program had commenced, and within a few months, the vaccination campaign was abandoned altogether. Surveillance for GBS cases thereafter revealed an almost 10-fold increased risk of development of GBS during the 6 weeks following receipt of the 1976 vaccine [2].

Complete recovery is the norm for about 80%; however, 10% of patients have a very prolonged course with or without significant residual weakness. Approximately 5% of patients do not survive the illness.

One of the differential diagnoses of GBS that stand out is Transverse Myelitis (TM), TM is a rare problem causing inflammation of both sides of 1 or 2 segments of the spinal cord (usually thoracic). The exact cause is uncertain, but it appears to be an autoimmune reaction. Onset typically follows a viral infection, but it is also associated with multiple sclerosis and several autoimmune disorders. There are some reported cases of TM occurring rarely after some vaccinations. Clinical presentation is usually acute and progressive over a few days, with early paresthesias, bilateral leg weakness, and numbness with a sensory deficit below the level of the lesion and that is the main difference between GBS and

TM. Sphincteric disturbances and backache are also common. A slight asymmetry of the Symptoms and signs, a sensory level over the trunk, or a Babinski sign differentiate it from a rapidly progressive polyneuropathy as Guillain-Barre syndrome. MRI with contrast shows the inflammation of the cord. CSF analysis shows increased protein, lymphocytosis, and normal glucose.

GBS was reported after influenza vaccination in the late 1970s and 1990s and after the meningococcal conjugate vaccine in 2005. Causality has not been established for either vaccine, and the subject is highly controversial. There is no requirement with these vaccines to warn patients about possible GBS, but patients with a history of GBS are cautioned to avoid vaccination for the 1st year after their illness.

No clear pathogenesis has thus far been discovered. It has been postulated that contaminating proteins or other vaccine components may elicit anti-ganglioside antibody production, and that the increased filtration and purification steps used in more recent vaccines help to reduce, but not completely eliminate, this risk [3-6].

### Conclusion

As there is increased numbers of reported cases of GBS after COVID-19 vaccination, it's important to find out if there is any causal relationship between the COVID-19 vaccine and GBS.

We hope that our case will encourage further research on this subject and will alarm healthcare professionals put GBS in the differential diagnosis for patients who present with acute flaccid paralysis (AFP) after receiving the COVID-19 vaccine.

**Consent for publication:** Written informed consent was obtained from the patient for publication of this case report and the accompanying image.

**Ethical approval:** Written informed consent was obtained from the patient for publication of this case report and the accompanying image.

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