

Azd-1222/bbipb-covr/covid-19-vaccine-gamaleya-national-research-center-of-epidemiology-and-microbiology**S****Guillain-Barre syndrome: 9 case reports**

In this study, 9 patients [7 men and 2 women] aged 26-87 years from four referral centers for neuromuscular disorders in Iran between 08 April 2021 and 20 June 2021 were described, who developed Guillain-Barre syndrome (GBS) following administration of AZD-1222, BBIBP-CorV or COVID-19-vaccine-Gamaleya-National-Research-Center-of-Epidemiology-and-Microbiology for COVID-19 immunization [*routes and dosages not stated*].

Case 1: The 38-year-old man presented with peripheral facial palsy. He received COVID-19-vaccine-Gamaleya-National-Research-Center-of-Epidemiology-and-Microbiology [Sputnik V COVID-19] vaccine, 2 weeks before. After 2 days, the left side of the face was also involved with headache and paresthesia in the distal of the upper limbs. He was admitted to the hospital. The neurological examination revealed bilateral facial palsy (House-Brackmann (HB) grade 4) without the involvement of other cranial nerves. He had generalised areflexia with normal sensory examinations. On the third day of admission, lumbar puncture revealed a protein level of 220mg/dL and white cell count was 10 with 60% lymphocytes. Cervical and brain MRI revealed mild protrusion of the C5-C6 intervertebral disc. After 9 days of disease onset, electrodiagnostic test was performed which showed normal motor and sensory conduction studies and F-wave latencies. Blink reflex revealed prolonged latency in bilateral R1 and R2. Based on these findings, he was diagnosed with GBS. He was treated with plasma-exchange [PLEX] to replace 20% human serum albumin in saline. Thereafter, his facial paresis showed a significant improvement.

Case 2: The 38-year-old man was admitted to the hospital with a 5 day history of ascending progressive and symmetric paresthesia in hands and feet. He received the first dose of COVID-19-vaccine-Gamaleya-National-Research-Center-of-Epidemiology-and-Microbiology, 14 days before admission. Following vaccination, he developed a low-grade fever and sore throat. After six days, he developed bilateral facial weakness and lower limb weakness. Due to autonomic symptoms and rapid disease progression, he was admitted to the intensive care unit. The neurological examination revealed bilateral facial palsy, mild decreased light touch sensation and proprioception in the lower limbs, distal to the ankle joints. The muscle strength examination revealed weakness in all four limbs with an MRC of 4/5 in proximal and distal of the upper extremities, 2/5 in proximal and 3/5 in distal of the lower extremities. Cervical and brain MRI revealed a few nonspecific T2-hyperintensities in the brain white matter. Lumbosacral MRI with gadolinium showed cauda equina nerve roots enhancement. On day 5, electrodiagnostic test demonstrated decreased sensory nerve action potentials (SNAPs) amplitude with slowing conduction velocities (CV). Motor studies revealed slowing of CV with temporal dispersion and conduction block in bilateral tibial nerves. These findings were in favor of an acute demyelinating sensorimotor polyneuropathy. CSF analysis demonstrated a protein level of 180 mg/dL and a white cell count of 10 with 100% lymphocytes. He was treated with plasma-exchange. At discharge, he had moderate bilateral facial paresis and muscle strength showed an MRC score of 4/5 in the upper limbs and 3/5 in the lower limbs. Based on these findings, he was diagnosed with GBS. After 2 weeks, the muscle strength in the upper limbs was 5 and in the lower limbs was 4.

Case 3: The 87-year-old man, who had ischemic heart disease and diabetes mellitus, was admitted to the hospital with progressive upper and lower limbs weakness. He received the first dose of BBIBP-CorV [Sinopharm COVID-19] vaccine, 4 days before. Following vaccination, he had mild myalgia. On admission, motor examination showed hypotonia in bilateral upper and lower extremities with an MRC of 1/5 in both proximal and distal limbs. The sensory study revealed a decrease in pinprick sensation in bilateral lower extremities up to the knees. He was generalised areflexia. Routine lab tests revealed increased blood sugar. CSF analysis demonstrated protein of 133 mg/dL and WBC of 0. Brain MRI revealed mild diffuse cortical atrophy and evidence of ischemic microvascular changes in the deep white matter. After 7 days of disease onset, electrodiagnostic test showed unobtainable SNAPs with severely decreased amplitude in the upper limbs CMAPs and conduction slowing. Based on these findings, he was diagnosed with GBS. Over 5 days, he was treated with IV immune-globulin [IVIG] which was started on the second day of admission. Following treatment, his muscle strength showed an MRC score of 2/5 in proximal of the upper and lower limbs and 3/5 in distal of the upper limbs. During his stay at the hospital, he received physiotherapy and was referred to a rehabilitation center after discharge.

Case 4: The 52-year-old man, who had a history of hypothyroidism, was admitted to the hospital with progressive weakness of the upper and lower limbs which started 12 days before. He received COVID-19-vaccine-Gamaleya-National-Research-Center-of-Epidemiology-and-Microbiology [Sputnik V COVID-19] vaccine. After 3 weeks, the first symptom was paresthesia of the lips and one-third of the anterior tongue was observed. After 4 days, paresthesia developed in the distal upper and lower extremities along with gait disorder and weakness of the lower limbs. Motor examination revealed an MRC of 4/5 in the upper limbs and 3/5 in the lower extremities with generalised areflexia. Sensory examination indicated a decrease in pinprick sensation in the bilateral distal of the upper and lower extremities. CSF protein was 165 mg/dL. After 1 week, electrodiagnostic test showed decreased amplitude in all tested SNAPs and lower limbs CMAPs with slowing of CV. On basis of clinical and neurological examination, he was diagnosed with GBS. He was treated with IV immune-globulin [IVIG] for 5 days. On day 3 of IV immune-globulin treatment, his muscle strength improved, and slowly, he could walk without assistance.

Case 5: The 48-year-old woman was admitted to the hospital with progressive weakness of the upper and lower limbs which had started 4 days before. She received COVID-19-vaccine-Gamaleya-National-Research-Center-of-Epidemiology-and-Microbiology [Sputnik V COVID-19], 17 days before the onset of the symptoms. Following vaccination, she had fever, myalgia, headache and vomiting. At hospitalization, she had a generalized weakness with bulbar symptoms, dyspnoea and autonomic disorder. Due to respiratory distress, she was intubated and was admitted to the ICU. Cranial nerves examination showed bilateral asymmetric facial weakness. The limb and neck muscle strength was severely reduced with an MRC score of 1/5 in proximal and distal of the upper and lower limbs and flexion and extension of the neck. The DTRs were absent, and position sensation was impaired in the distal limbs. On basis of clinical and neurological examination, she was diagnosed with GBS. She was treated with plasma-exchange [PLEX]. However, after one session of plasma-exchange, she developed hypotension and elevated serum troponin. ECG changes confirmed an acute coronary attack. She was treated with aspirin, clopidogrel [Plavix] and atorvastatin. Plasma-exchange was discontinued and she was treated with IV immune-globulin [IVIG] for 5 days. After three weeks, she had no improvement and IV immune-globulin was injected again. After 2 weeks, she was weaned from the ventilator and was discharged to a rehabilitation center.

Case 6: The 26-year-old woman was admitted to the hospital with progressive paresthesia and weakness of the limbs. She received the second dose of BBIBP-CorV [Sinopharm COVID-19] vaccine, 2 weeks before the onset of symptoms. Neurological examinations showed tetraparesis as follows: MRC score of 3/5 in distal of the lower limbs, 4/5 in proximal of lower and distal of the upper limbs, and 5/5 in proximal of the upper limbs. On day 3 after the onset of the disease, electrodiagnostic test and lumbar puncture was performed which showed prolonged F waves and the absence of H waves. Based on these findings, she was

diagnosed with GBS. She was treated with IV immune-globulin [IVIG] for 5 days. At the time of discharge, the muscle strength improved.

Case 7: The 44-year-old man presented with paresthesia and weakness in the lower limbs, a day before. He received the first dose of AZD-1222 vaccine [Astra-Zeneca COVID-19 vaccine], about five weeks before the onset of symptoms. About 5 months before, he had mild to moderate COVID-19 infection and hypertensive crisis after 1 day, which was managed by furosemide and captopril. Neurological examinations demonstrated inability to walk, flaccid tetraparesis with an MRC score of 2/5 in the upper and lower limbs. CSF analysis revealed high protein without cells. Based on these findings, he was diagnosed with GBS. He was treated with IV immune-globulin [IVIG] for 5 days. On day 5 of admission, bilateral facial palsy appeared. A couple of days after starting IV immune-globulin, the progression of weakness reached the plateau. Electrodiagnostic test was performed about three weeks after beginning symptoms and found a pronounced reduction in CMAPs amplitude with mildly reduced SNAPs, except for sural nerve. He was discharged and was referred to the rehabilitation center. After 10 days of discharge, muscle strength improved.

Case 8: The 76-year-old man presented with ascending weakness in the upper and lower limbs, which started 4 days before. He was unable to walk, 2 days before. He received a first dose of the BBIBP-CorV [Sinopharm COVID-19] vaccine, 14 days before the beginning of symptoms. Muscles strength showed an MRC of 4/5 in the upper limbs and 2/5 in the lower limbs with generalized areflexia and without apparent sensory deficits. CSF analysis showed a mildly elevated protein. After 6 days of clinical presentation, the electrophysiological assessment was performed which showed a pattern of Acute Motor Axonal Neuropathy (AMAN) variant of GBS. He was treated with 5 sessions of plasma exchange and was referred to a rehabilitation center after discharge.

Case 9: The 79-year-old man, who had hypertension and underwent coronary artery bypass graft, presented with dysphagia and weakness of the upper and lower limbs which had started 7 days before. He received the first dose of AZD-1222 vaccine [Astra-Zeneca COVID-19 vaccine], a week before the onset of symptoms. On admission, the neurological examination showed bilateral facial palsy and muscles strength was an MRC of 4/5 in proximal and distal of the upper extremities and 4/5+ in the lower extremities. After 7 days of clinical symptoms, electrophysiological assessment was performed which showed declined amplitude in SNAPs and CMAPs studies compatible with the AMSAN variant of GBS. At the time of writing this report, he was hospitalised and treated with plasma-exchange.