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Case Report

Guillain-Barré Syndrome associated with SARS-CoV-2 infection in Nepal: A case report

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ABSTRACT

Introduction: Corona viruses may also affect the central nervous system, inducing various neurological problems. Guillain-Barré Syndrome (GBS) is a rare immune-mediated post-infectious neuropathy typically leading to ascending weakness. Herein, we present a case of the patient to show an association of GBS and SARS-CoV-2 infection in Nepal

Case presentation: Twenty-seven yrs old man show an association of GBS and SARS-CoV-2 infection in Nepal who presented with difficulty in walking, backache, tingling sensations over the bilateral wrist and ankle, and features of facial nerve palsy. The diagnosis of GBS was made. Following Intravenous Immunoglobulin (IVIg) administration, the patient started showing motor recovery within a week.

Clinical discussion: Patient who developed GBS as a likely post-infectious complication after the initial onset of infectious symptoms with persistent mild dry cough.

Conclusion: GBS has severe complications and early diagnosis is important to monitor for loss of ambulation and initiation of immunoglobulin treatment. GBS should be considered as a potential rare but serious complication due to COVID-19

1. Introduction

Corona virus disease 2019 (COVID-19), largest and most severe pandemic since the 1918 influenza pandemic, is caused by the corona virus strain of severe acute respiratory syndrome corona-virus 2 (SARS-CoV-2). [1]. COVID-19 predominantly presents with respiratory symptoms with mild clinical features in the majority of patients. Apart from the respiratory system, corona viruses may also affect the central nervous system, inducing neurological problems [2]. The various neurological manifestations of COVID-19 are headache, stroke, seizures, encephalitis, hypogeusia, and neuralgia [3–5].

Guillain-Barré Syndrome (GBS) is an acute polyradiculopathy disorder characterized by progressive, symmetrical limb weakness, areflexia on examination, sensory symptoms, and in some patients, facial weakness developing over several days and weeks. GBS is a rare immune-mediated post-infectious neuropathy typically leading to ascending weakness. GBS has been reported as a possible rare sequela of COVID-19 [6–8]. In this report, we present an association of GBS and SARS-CoV-2 infection in Nepal following SCARE guidelines [9].

2. Case presentation

Twenty-seven yrs old man presented to the emergency department with difficulty in walking, backache, tingling sensations over the bilateral wrist and ankle of 6 days duration. According to him, the weakness and muscle pain over lower limbs gradually increased from previous days. However, his bladder and bowel habits were normal. He denied a history of recent diarrhea but complained of a dry cough for the last 2 weeks. He didn't give a history of recent vaccinations, animal bite, fever, shortness of breath, and girdle like sensation over the abdomen. However, he complained of deviation of the mouth towards the right side and drooling of saliva, and excessive lacrimation from the left eye of 5 days duration as shown in Fig. 1.

On general and physical examination, he appeared to be conscious,

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Fig. 1. Lower motor neuron type of left sided facial nerve palsy.

attentive, and well oriented. His temperature and other vital signs were within normal limits. There were no rashes. His ear examination was normal. The initial neurological assessment showed symmetrical weakness affecting lower limb muscle groups with normal muscle bulk, reduced motor power with weakness of Medical Research Council (MRC) Muscle Scale 3/5, hypotonia, absent ankle, and knee reflexes, and an impaired sensation regarding pain and a light touch of both feet up to the mid legs. The neurological examination of the upper limbs revealed normal muscle bulk, power, and tone, reflexes were elicited with reinforcement. All cranial nerve examinations were normal except for left facial droop, effacement of left nasolabial fold while smiling, inability to close the left eye, raise the left eyebrow, and frown; all consistent with Lower Motor Neuron type of left-sided Facial nerve palsy (Fig. 1 and 2). He denied a history of blurring of vision, difficulty in speech, difficulty in swallowing. There were no signs of meningism, spinal cord sensory level, bladder or bowel involvement, or dysautonomia. Cardiac, pulmonary, and abdominal examinations were normal during admission.

Fig. 2. Lower motor neuron type of left sided facial nerve palsy with need of support to stand and walk.

3. Investigations

Complete blood count and comprehensive metabolic panel were within normal limits. He had elevated creatine kinase (CK) of 250 IU/L. Given the view of the current worldwide pandemic and the patient's history of persisting mild dry cough, his Nasopharyngeal swab was sent for SARS- CoV-2 identification on the very day of admission. His Lumbar puncture was done for CSF analysis 1 day after the admission. His cerebrospinal fluid (CSF) showed cytoalbuminologic dissociation (protein 104 mg/dL, white cell count 3 cells/cumm). His CSF was not sent for SARS- CoV-2 detection. His Nasopharyngeal swab tested positive for SARS-CoV-2 on RT-PCR. Serum ferritin. D-dimer and chest X-Ray PA views were normal. Nerve conduction velocity studies of the right tibial nerve, and left peroneal nerve revealed delayed latencies and low amplitude with the dispersion of compound muscle action potentials, and with no F-wave response with impaired sensory conduction, which is consistent with demyelinating polyneuropathy. Magnetic resonance imaging of the brain and the whole spine was performed and revealed normal findings. The patient was diagnosed as a case of Mild COVID -19 infection with GBS.

4. Treatment

During a few days of admission, the patient was monitored in the intensive care unit. He received Intravenous Immunoglobulin (IVIg) 0.4 g/kg daily for 5 days. The patient's motor symptoms began to improve within the first week of IVIg administration. After two weeks of the onset of illness, a nasopharyngeal swab was taken and yielded negative PCR results for SARS-CoV-2. Three weeks later, the patient had significant improvement in facial asymmetry, drooling of saliva, and lacrimation. With regular use of physiotherapy and neurorehabilitation exercises, he started walking unassisted even after 3 weeks of illness as shown in Fig. 3. The patient was discharged home with neurologically improved lower limb power (4+/5), balanced gait, decreased numbness, and normal proprioception, and improvement of respiratory symptoms.

5. Discussion

In this report, we have presented a patient who developed GBS as a likely post-infectious complication after the initial onset of infectious symptoms with persistent mild dry cough. This patient had SARS-CoV-2 detected via nasopharyngeal RT-PCR. Despite neurological sequelae, RNA may not be detected in CSF as seen in other case reports. CSF is often negative of virus particles, despite positive result for SARS-CoV-2 RNA on nasopharyngeal swabs [3,6]. So, CSF analysis for SARS-CoV-2 identification in this patient was not done. During, the COVID-19 pandemic, the first reported case of COVID-19 associated GBS was from Wuhan as a suspected parainfectious disease, where the patient developed COVID-19 symptoms 7 days after the onset of GBS symptoms [10]. The gap of 5–10 days between the initiation of viral illness and the onset of first symptoms of Guillain–Barré syndrome is similar to the GBS that occurs during or after other infections [11]. In the past too, there have been many case reports of an association between GBS and corona virus infections [12,13]. It has been seen that some SARS coronavirus have the ability to spread via a synapse-connected route to the medullary cardio-respiratory center from the mechanoreceptors and chemoreceptors in the lower respiratory airways [2]. To date, there is no current evidence of direct viral invasion by SARS-CoV-2 with inflammation and/or degeneration of motor neurons and peripheral nerves as seen with certain viral infections including poliovirus, enterovirus-68,

Fig. 3. Recovered Lower motor neuron type of left sided facial nerve palsy without need of support to stand and walk.

herpes zoster, and cytomegalovirus. In addition to it, known mechanisms of molecular mimicry were documented between the "prototype" ganglioside GM1 (monosialotetrahexosylganglioside) and the lipooligosaccharide component of *Campylobacter jejuni* isolated from GBS patients [14].

Unilateral facial palsy simulating unilateral Bell's palsy is a rare presenting symptom. There are several theories about the cause of unilateral facial palsy in GBS. One of the theory suggests that Facial palsy in GBS may be due to neural compression in a narrow internal acoustic canal and may be aggravated by facial nerve edema and hemorrhage caused by hypertension [15]. Similarly, it can be caused by antibody-mediated demyelination, which may be the possible explanation in this patient [16]. The appearance of bulbar palsy is as frequent as facial diplegia in GBS [17]. Bulbar palsy can occur together with other cranial nerve palsies, usually the facial nerve. It is estimated that about 15%–20% of GBS cases who require mechanical ventilation were noted to have preceding dysphagia and facial weakness. Bulbar palsy indicates impending grave respiratory paralysis; therefore, the requirement of respiratory support may be necessary [18]. So, utmost observation is required to identify bulbar involvement as early as possible to prevent morbidity and mortality too. Luckily, only the facial nerve was involved in this patient without bulbar involvement.

Intravenous Immunoglobulin (IVIg) is often the initial therapy chosen because of its ease of administration and good safety profile. There are significant advantages of favouring IVIg as a treatment regarding time to onset of disease and time to improve on a slightly expanded version of the GBS disability grade scale [19]. Owing to this fact, IVIg was administered once the diagnosis was made. Accordingly, the patient also showed early signs of improvement with the use of IVIg (within a week, his lower limb motor symptoms were improved).

6. Conclusion

Amid COVID-19 pandemic, patients presenting with tingling sensations, paresthesia, and difficulty in walking associated with COVID-19 symptoms should not be overlooked only as viral associated arthralgia and myalgia. Early administration of IVIg prevents morbidity and mortality related to GBS. GBS should be considered as a potential rare but serious complication due to COVID-19.

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Ethical approval

This is case report: therefore, it did not require ethical approval from ethics committee.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal on request.

Author contribution

All authors: writing the paper, collection of Data, revising it critically for important intellectual content, review and editing.

Registration of research studies

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor

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Declaration of competing interest

The authors declare that they have no competing interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.104214.

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