Multiple Cerebral Hemorrhages during the Course of Guillain–Barre Syndrome: A Case Report

Sedat IŞIKAY1,2, Akif ŞIRİKCİ2

1Department of Physiotherapy and Rehabilitation, School of Health Sciences, Hasan Kalyoncu University, Gaziantep, Turkey,
2Department of Pediatric Neurology, Medical Park Hospital, Gaziantep, Turkey, 3Department of Radiology, Medical Park Hospital, Gaziantep, Turkey

Address for correspondence: Dr. Sedat IŞIKAY, Department of Pediatric Neurology, Medical Park Hospital, 52063 Street, Şehitkamil, Gaziantep, Turkey.
E-mail: dr.sedatisikay@mynet.com

Guillain–Barré syndrome (GBS) is an acute inflammatory polyneuropathy. In this report, we present a 3-year-old girl diagnosed with cortical and subcortical hemorrhage during the course of GBS who was treated with intravenous immunoglobulin. To the best of our knowledge, central nervous system hemorrhage during the course of GBS is an extremely rare condition. We believe that all clinicians following patients with GBS or using intravenous immunoglobulin for any indications should be aware of this rare but potentially life-threatening condition.

Keywords: Child, Guillain–Barré syndrome, hemorrhage, intravenous immunoglobulin

Introduction

Guillain–Barré syndrome (GBS) is an acute inflammatory polyneuropathy that mainly affects human spinal nerve roots and peripheral nerves. The most common etiological factors in patients with GBS are the bacterial or viral infections. The main mechanism defined in GBS development is the infiltration of lymphocytes and macrophages around the small blood vessels of peripheral nerves resulting in demyelination.[1]

Intravenous immunoglobulin (IVIG) is a safe and frequently used drug in the treatment of GBS. Headache, aseptic meningitis, cerebral vascular contraction syndrome, thromboembolism, and stroke are neurological complications associated with IVIG treatment that were rarely reported.[2]

In this report, we present a 3-year-old girl diagnosed with central nervous system (CNS) hemorrhage during the course of GBS. Development of GBS following CNS hemorrhage has been reported before and was associated with the cytokine imbalance.[3] However, to the best of our knowledge, CNS hemorrhage during the course of GBS is an extremely rare condition.

Case Report

A 3-year-old girl was admitted to our clinic with a history of respiratory distress and bronchopneumonia. At admission, she was intubated with a Glasgow coma scale score of 7 and her deep tendon reflexes were hypoactive. It was learnt that her coughing and respiratory distress were progressively increased in the last 3 days. Her previous medical history was unremarkable. The brain tomography taken at admission was normal. Chest X-ray was compatible with bronchopneumonia. She was started to be followed on mechanical ventilator and ceftriaxone therapy was started. All laboratory data were unremarkable. On the seventh day of her hospitalization, electromyogram (EMG) was performed as her deep tendon reflexes were not present. Findings of EMG were consistent with the sensory motor neuropathy (AMSAN), especially with the involvement of the lower extremities. The patient...
was given IVIG for 5 days. On the 10th day of her hospitalization because of her seizures, phenytoin and levetiracetam treatments were started. Then, as seizure control could not be achieved, midazolam infusion was added. Brain computed tomography and magnetic resonance imaging were obtained that revealed a number of hemorrhagic areas in especially cortical–subcortical areas of the brain [Figure 1]. During the entire follow-up period, the vital signs of the patient were stable. These findings suggest that there may be a vasculopathy in the patient and angiography was performed. The angiographic findings were compatible with vasculopathy [Figure 2]. Pulse steroid treatment was started for 10 days and then gradually ceased. It was observed that the patient could move her legs on the 24th day of her hospitalization. Midazolam and phenytoin treatments were interrupted as seizures were not present. The patient was extubated on the second month of her hospitalization. Levetiracetam treatment of the patient was discontinued because of normal electroencephalogram findings. Per oral feeding was started. On the fourth month of her hospitalization, the patient was discharged to receive physical therapy with mild gait disturbance. The patient recovered without any sequelae on follow-ups.

**Discussion**

In this report, we reported a young child who developed many intracranial hemorrhages while she was under treatment for GBS and recovered without any sequelae with appropriate management. To the best of our knowledge, cortical or subcortical hemorrhages during the course of GBS are extremely rare and it is still not clear that this condition is associated with directly GBS or IVIG used for the treatment of GBS.

The data about the intracranial hemorrhages associated with GBS are very limited in the literature. Doss-Esper et al.\[5\] reported a patient with GBS who developed acute hypertension and ischemic and hemorrhagic strokes shortly after initiating IVIG therapy. Recently, Wuo et al.\[6\] reported two patients with cerebral hemorrhagic stroke during the course of GBS and reported that CNS hemorrhage following GBS was associated with blood vessel autonomous dysfunction and IVIG treatment. They also reported good prognostic results with prompt diagnosis and treatment in those patients, as in our patient. In our patient, intracranial hemorrhages were determined 5 days later the IVIG treatment. During the course of GBS, it may be suggested that brain hemorrhage may develop secondary to brain damage because of impairment of the humoral immune response or infiltration of lymphocytes and macrophages around the small blood vessels of peripheral nerves in the course of GBS may also result in vasculopathy inducing hemorrhages. Moreover, as mentioned above, this condition may also be associated with IVIG treatment. In fact, IVIG is also an important treatment method in immune-mediated thrombocytopenia that prevents hemorrhages.\[7\] IVIG is a well-known immune-modulator. Thrombotic microangiopathy or cerebral infarctions were reported before associated with IVIG treatment but intracranial hemorrhages were not defined as a complication of IVIG treatment.\[8,9\] However, vasculopathy may be triggered with IVIG treatment that may result in cerebral hemorrhages.

![Figure 1: Brain magnetic resonance imaging T2-weighted axial section showing the appearance of multiple intracranial bleeding sites in subcortical areas](image1)

![Figure 2: Pial collaterals supporting distal irregularity and vasculopathy in distal MCA branches](image2)
In this report, we presented an unusual condition, CNS hemorrhage during the course of GBS. It is a very rare condition but it is also extremely important as with prompt diagnosis and treatment it has a very good prognosis. Moreover, IVIG is a commonly used treatment in many diseases other than GBS and CNS hemorrhage may also be suggested to be associated with IVIG. We believe that all clinicians following patients with GBS or using IVIG for any indications should be aware of this rare but potentially life-threatening condition.

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Conflicts of interest
There are no conflicts of interest.

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