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Correspondence: Guillain-Barré syndrome and hemorrhagic fever with renal syndrome

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Abstract

Jiao and colleagues reported a case of hemorrhagic fever with renal syndrome who developed respiratory failure and symmetrical flaccid paralysis of all extremities. Electrophysiology revealed peripheral nerve injuries mainly in axons. They reached a diagnosis of Guillain-Barré syndrome (GBS) associated with hemorrhagic fever with renal syndrome. Although the case is interesting, the diagnosis of GBS in such a patient should be with caution. Critical illness polyneuropathy (CIP) is an important and common differential diagnosis of GBS, especially in intensive care settings. Differentiating CIP from the axonal variants of GBS may be difficult on purely clinical grounds. Albumino-cytologic dissociation in CSF can help differentiate GBS from other disorders.

Keywords: Hemorrhagic fever with renal syndrome, Guillain-Barré syndrome, Critical illness polyneuropathy, Albumino-cytologic dissociation

Background

Jiao and colleagues reported a case of hemorrhagic fever with renal syndrome who developed respiratory failure and symmetrical flaccid paralysis of all extremities [1]. Electrophysiology revealed peripheral nerve injuries mainly in axons. They reached a diagnosis of Guillain-Barré syndrome (GBS) associated with hemorrhagic fever with renal syndrome. Although the case is interesting, the diagnosis of GBS in such a patient should be with caution.

GBS is an immune-mediated disorder of the peripheral nervous system and respiratory failure requiring mechanical ventilation is a serious complication of GBS [2]. However, the reported patient developed respiratory failure and refractory shock first, and then received mechanical ventilation. As per the description provided by the authors, the patient presented with symmetrical flaccid paralysis of all extremities but normal spontaneous respiration after cease of sedation, analgesia and muscle relaxants, on day 12 [1]. Usually, respiratory muscles are

easily involved in a quadriplegic GBS patient. Of note is that the patient was absent from diplopia or facioplegia. In this regard, critical illness polyneuropathy (CIP) should be highly suspected.

CIP and critical illness myopathy (CIM) are frequent complications of critical illness involving both of the motor and sensory axons [3, 4]. The cardinal clinical sign of CIP and CIM presents as flaccid and symmetric weakness of extremities as well as respiratory muscles [3, 5]. Patients with CIP may show a distal sensory loss, e.g. pain, temperature, or vibration [3, 5]. CIP and/or CIM occur in approximately 70% of patients with sepsis or systemic inflammatory response syndrome (SIRS) [2, 5], 60% of acute respiratory distress syndrome [2, 5], and up to 100% of patients with multiple organ failure [2, 5]. CIP and CIM alone, or in combination prolong weaning from mechanical ventilation and physical rehabilitation [3, 5].

We previously reported a case of critical illness polyneuropathy and myopathy with reversible tetraplegia after percutaneous nephrostolithotomy and septic shock [6]. The axonal variants of GBS might be difficult to distinguish from CIP due to the similar clinical manifestations and electrophysiological signs. Although the clinical presentation and electrophysiology would not

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give supportive discrimination, cerebral spinal fluid (CSF) might be of help. A clinical hallmark of GBS is albumino-cytologic dissociation in CSF [7]. In this case, the patient failed to receive a lumbar puncture. Therefore, the differential diagnosis of CIP cannot be ruled out.

Authors' response

Lei Wu, Xuan Sun and Jie Hu

Zhang and colleagues suggested a reasonable doubt about the patient's diagnosis that we should take critical illness polyneuropathy (CIP) or critical illness myopathy (CIM), instead of Guillain-Barré syndrome (GBS), into consideration based on the scenario of critical illness. Although it is difficult to distinguish CIP/CIM and GBS because of their similar clinical manifestations (such as axonal motor and sensory polyneuropathy), some factors should be taken into account when we deal with this dilemma.

First, prolongation of F-waves on electromyography (EMG) is the most important feature of GBS other than CIP/CIM [8]. Nerve root impairment is one of the characteristics of GBS, and it usually appears as prolongation of F-waves on EMG [9] and albuminocytological dissociation in cerebrospinal fluid (CSF). Of note is absence of prolongation of F-waves is one of the diagnostic criteria for CIP [8]. In our case, the patient showed absence of F wave in right tibial nerve and prolongation of F-wave in left tibial nerve [1], which is a strong supportive evidence of GBS.

Second, the lack of evidence of albuminocytological dissociation should not be an exclusion criterion for GBS. Based on our current knowledge, only 64% of patients with GBS have the feature with albuminocytological dissociation [10]. According to the recently proposed new diagnostic classification system, GBS diagnosis can be decided with clinical ground and EMG manifestations, without the need for additional laboratory tests, and whether or not they fulfill existing diagnostic criteria [11].

Third, we cannot arbitrarily exclude the diagnosis of GBS due to the absence of cranial nerve deficits, such as diplopia or facioplegia. GBS is highly diverse in terms of the presence, distribution and extent of cranial nerve deficits, sensory symptoms, weakness, ataxia, and the course of the disease [10]. Only 50% of the GBS patients present cranial nerve deficits [12].

Fourth, the presence or absence of respiratory problems cannot be used in differential diagnosis of ICUAW and GBS since respiratory muscle weakness also occurs commonly in patients with CIP/CIM [13].

Fifth, good response to intravenous immunoglobulin (IVIG) therapy strongly supported the diagnosis of GBS. For GBS, IVIG or plasma exchange (PE) is the optimal

In summary, CIP is an important and common differential diagnosis of GBS, especially in intensive care settings. Differentiating CIP from the axonal variants of GBS may be difficult on purely clinical grounds. Albumino-cytologic dissociation in CSF can help differentiate between these two diseases.

management approach, alongside supportive care [14]. CIP and CIM are pathophysiologic definition describing the weak critically ill patient with evidence of associated neuromuscular dysfunction, which represent the most prominent causes of intensive care unit acquired weakness (ICUAW). In intensive settings, sepsis, shock, hyperglycemia, the presence and degree of multiorgan failure, immobilization, and the utilization of steroids or neuromuscular blocker are the potential risk factors of ICUAW [15]. Unlike GBS, there are no proven therapies that could reverse ICUAW, i.e., CIP and CIM [8]. Treatment of underlying disease such as sepsis and shock, control of hyperglycemia, minimization of sedation, and early mobilization might be potential therapeutic strategies for ICUAW [15].

Last, etiological agents might highlight the diagnosis of GBS. Wachira et al. found that virus (such as cytomegalovirus and influenza virus) and *Campylobacter jejuni* infection were the most commonly etiological agents in GBS development in a meta-analysis [14]. However, this meta-analysis did not include the six cases of GBS subsequent to Hantavirus infection because they were single case reports.

In summary, we hold the opinion that our patient is a case of GBS (AMSAN) associated with Hantavirus infection. In intensive care settings, ICUAW should be suspected once the patients presented flaccid quadriplegia and neuromuscular respiratory failure, especially after recovery of sepsis, shock and multiorgan failure. Of note is that in patients with virus or *Campylobacter jejuni* infection, EMG should be performed to identify GBS. In that case, targeting therapy, like IVIG or PE, could be immediately initiated to get a better prognosis.

Abbreviations

CIM: Critical illness myopathy; CIP: Critical illness polyneuropathy; CSF: Cerebral spinal fluid; GBS: Guillain-Barré syndrome; SIRS: Systemic inflammatory response syndrome

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Authors' contributions

LJ and RJ drafted the manuscript. HZ conceived the idea and critically revised the manuscript. All authors approved the final version of manuscript for submission.

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Competing interests

The authors declare that they have no competing interests.

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