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Case Report

Guillain-Barré Syndrome and Human Immunodeficiency Virus

Nermin Kelebek Girgin[1], Remzi İşçimen[1], Emel Yılmaz[2], Ş. Ferda Kahveci[1], Oya Kutlay[3]

[1]*Department of Anaesthesiology and Reanimation, Intensive Care Unit, Uludağ University Faculty of Medicine, Bursa, Turkey*

[2]*Department of Infectious Disease and Microbiology, Uludağ University Faculty of Medicine, Bursa, Turkey*

[3]*Private Medicabil Hospital, Bursa, Turkey*

Abstract

Guillain-Barré syndrome (GBS) is an acute disease characterised by symmetrical muscle weakness, loss of sensation and reflex. There is usually a viral infection at the beginning of the disease. Here, we report a GBS case which did not respond to any treatment strategy at first and was diagnosed as Human Immunodeficiency Virus positive (HIV+) during the search for the aetiology. A 32-year-old male patient who presented to a medical centre with symptoms of gait disturbance and arm and leg numbness was found to have albuminocytologic dissociation upon cerebrospinal fluid examination. After the diagnosis of GBS, immunoglobulin G (IVIG) therapy (400 mg kg^{-1} day^{-1} 5 days) was started as a standard therapy. This therapy was repeated due to a lack of improvement of symptoms. During this therapy, the patient was sent to our clinic with symptoms of respiratory failure and tetraplegia. He was conscious, cooperative, haemodynamically stable and his arterial blood gas analyses were: pH: 7.28, PaO_2: 74.4 mmHg, PCO_2: 63.8 mmHg. He was intubated, mechanically ventilated and underwent plasmapheresis. After the investigation of aetiology, HIV(+), CD4/CD8: 0.17, absolute CD4: 71 cells mL^{-1} were detected and antiretroviral therapy was started. The patient died from multiple organ failure due to sepsis on day 35. In conclusion, HIV infection should be kept in mind in GBS patients, especially those not responding to routine treatment. As a result, not only could the patient receive early and adequate treatment, but also HIV infection transmission would be avoided.

Key Words: Guillain-Barré syndrome, Human Immunodeficiency Virus, intensive care

Introduction

Guillain-Barré syndrome (GBS) or acute demyelinating polyneuropathy is an acute disease, which is characterized by symmetric muscle weakness, loss of sensation and loss of deep tendon reflexes (1, 2). Its incidence ranges between 0.6 and 4/100 000 annually, and it is 1.5-2 times frequent in males compared to females (1, 3). Numerous factors such as various microorganisms ranging from bacteria to viruses and stress of surgical intervention have been accused in the aetiology of the disease (1-4). It has been reported that 2/3 of cases develop a flu-like disease or gastroenteritis 6 weeks before the occurrence of disease (2-4). It has been claimed that the infection creates an immune response which cross-reacts with axolemmal or Schwann cell antigens, leading to peripheral nerve damage (1).

Generally the first symptoms of Guillain-Barré syndrome are pain, weakness, numbness and paraesthesia in the extremities (1). Hypoventilation due to respiratory muscle and diaphragm weakness, retained secretions due to loss of cough reflex, loss of airway protective mechanisms and autonomic dysfunction (tachycardia/bradycardia, other arrhythmias, hyper/hypotension) may be seen during the course of the disease. Approximately 25% of the cases are treated in the intensive care unit (ICU) for endotracheal intubation, mechanical ventilation and close cardiovascular monitoring (1, 3).

Human Immunodeficiency Virus (HIV) infection courses with several different types of peripheral neuropathy such as distal sensory axonal polyneuropathy, polyradiculopathy or acute or chronic inflammatory demyelinating polyneuropathy (4). After the HIV infection epidemic, HIV cases associated with GBS have started to be reported (4-9). GBS is either diagnosed at the initiation or seroconversion stage of HIV disease or at chronic disease stage. Therefore, it has been suggested that treatment of HIV should also be considered in order to be more successful in GBS treatment (6).

Address for Correspondence: Dr. Nermin Kelebek, Department of Anaesthesiology and Reanimation, Intensive Care Unit, Uludağ University Faculty of Medicine, Bursa, Turkey Phone: +90 224 295 31 24 E-mail: nkelebek@uludag.edu.tr

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In this paper, we aimed to present a GBS case, which was hospitalized in the ICU to receive mechanical ventilation, with no response to immunoglobulin and plasmapheresis treatments initially and was found to have HIV positivity during the search for the aetiology, after obtaining informed consent from the relatives of the patient.

Case Presentation

A thirty-two years old male patient had been admitted to a medical centre with complaints of numbness in the legs and arms, gait disturbance and enteritis. As albuminocytologic dissociation had been determined in cerebrospinal fluid (CSF) analysis, the patient was diagnosed as GBS and received immunoglobulin G (IVIG) treatment for 5 days at a dose of 400 mg kg^{-1} day^{-1}, and upon seeing no relief in the symptoms, the treatment was repeated, electroneuromyography was performed and severe axonal polyneuropathy was observed. As the patient developed respiratory distress and tetraplegia during follow-up, he was referred to our hospital. The patient was conscious and cooperative and his vital signs were stable (blood pressure: 150/80 mmHg, heart beat rate: 96 beats dk^{-1}, body temperature: 36°C) in the emergency department evaluation. His neurological examination revealed unresponsiveness to painful stimuli in all extremities, abolished deep tendon reflexes and tetraplegia. Computed tomography (CT) of the brain was normal. The arterial blood gas analysis of the patient with respiratory distress was as follows, pH: 7.28, PaO_2: 74.4 mmHg, PCO_2: 63.8 mmHg, BE: 2.6 mmol L^{-1}, HCO_3: 29.6 mmol L^{-1}. The patient was admitted to the intensive care unit, he was intubated and invasive mechanical ventilation was commenced. As there was no improvement in the patient's condition after plasmapheresis, performed for five times, decision was made to investigate the aetiology. Anti-HIV-1 antibodies were determined by ELISA test and the result was verified by Western blot test. The patient was started on antiretroviral treatment (lamivudine, zidovudine, lopinavir, ritonavir) after determining that his CD4/CD8 ratio was 0.17 and absolute CD4 count was 71 cells/mL. Percutaneous tracheostomy was performed at the 14^{th} day of hospital stay. The patient who developed sepsis during treatment (A. baumannii was isolated in blood culture), died of multiple organ failure at 35 days of hospitalization.

Retrospective review of the case revealed that a health-care provider had a needlestick injury during tests performed in the medical centre the patient initially admitted, and he was scheduled to follow-up for HIV after our warning.

Discussion

Guillain-Barré syndrome is an acute autoimmune disorder causing nerve demyelination. It can easily be diagnosed by clinical and laboratory findings such as progressive weakness, loss of reflexes and albuminocytologic dissociation in the cerebrospinal fluid (1-3). Some of the cases are treated in the ICU due to respiratory failure or cardiovascular symptoms due to autonomic nervous system involvement. Besides mechanical ventilation support and monitoring of haemodynamic parameters and electrolytes, prevention of complications like thromboembolism and infection gain importance in these cases (10, 11). However, despite close monitoring in the ICU and specific treatments such as plasmapheresis or IVIG, 4-15% of cases still die (3, 10, 11). The major causes of death are pneumonia, sepsis and autonomic dysfunction (10).

Peripheral nervous system diseases including polyneuropathy, painful sensory neuropathy and polyradiculopathy are frequently seen in cases infected with HIV (4, 12, 13). GBS is an acute severe polyneuroradiculopathy with progressive symmetric extremity weakness that can be seen at any stage of HIV infection (5-9). The symptoms of GBS that develops during chronic phase of HIV infection, has been reported to show complete or partial regression after high dose IVIG or plasmapheresis. The authors suggested that antiretroviral therapy with drugs with a better CSF penetration should be considered before plasmapheresis and high dose IVIG in GBS patients with concomitant HIV infections (6). However, Schreiber et al. (8) observed functional recovery in a HIV (+)-GBS case without HIV treatment, and suggested that a comprehensive investigation is needed on this issue. Additionally, antiretroviral drugs used in HIV treatment was reported to cause acute motor and sensory axonal neuropathy, and it was brought forward that these drugs may also cause neuropathy by mitochondrial toxicity and neuroimmune mechanisms (13, 14).

Mortality in HIV-positive GBS cases varies between 0 and 45% (2, 7). Schleicher and colleagues (7) evaluated the GBS cases hospitalized in the ICU, and determined that 46% of the cases were HIV (+). In comparison of HIV (+) and HIV (-) cases, they found that HIV (+) cases were much younger than HIV (-) cases, although not statistically significant. It was reported that, similar to our patient, the cases evaluated in that study, had not received antiretroviral treatment before admission to the hospital and ICU, and the first clinical indicator of HIV infection was GBS. Furthermore, while there was no mortality in HIV (-) cases, one of the HIV (+)-GBS cases died. The CD4 leukocyte count of this case at the ICU was $46x10^6$ cells/L, and the patient died due to acute renal insufficiency and refractory shock secondary to sepsis. In the same study, it was determined that the mean CD4 count of HIV (+)-GBS cases was $322.5x10^6$ cells L^{-1}, and that those with CD4 count>$200x10^6$ cells L^{-1} survived. Brannagan et al (4) evaluated 10 HIV (+) - GBS cases and found that HIV diagnosis of 3 cases was verified in the ICU. One of these cases with an initial CD4 count of $175x10^6$ cells L^{-1} in the ICU, died due to cardiac reasons. The first CD4 count of our patient in the ICU was $71x10^6$ cells L^{-1} and he died of complications secondary to sepsis. When it is considered that he had had 2 years of extremity weakness in his medical history and weight loss complaints in the last 4 months, it is apparent that the case had a late diagnosis of HIV.

Conclusion

Guillain-Barré syndrome is a condition that should necessarily be considered in cases with weakness and paraesthesia complaints. In the presence of respiratory distress or autonomic dysfunction, the cases should be treated in the ICU. In GBS cases with no response to plasmapheresis or IVIG treatment, probability of HIV infection should come into mind. Antiretroviral treatment may improve the quality of life of the patient by decreasing the severity of symptoms of both HIV infection and GBS.

Informed Consent: Consent for publication of this case had been obtained form patients' relatives.

Peer-review: Externally peer-reviewed.

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