Archives of Anesthesiology and Critical Care (Winter 2025); 11(1): 113-115.

Available online at http://aacc.tums.ac.ir

Case Report

Sepsis Management in a Case of Myasthenic Crisis: A Case Report

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ARTICLE INFO

Article history:
Received 15 April 2024
Revised 08 May 2024
Accepted 03 June 2024

Keywords:
Myasthenic crisis;
Cautionary drugs;
Sepsis;
Multi drugs resistance

ABSTRACT

Myasthenic crisis can affect the respiratory muscles in a life-limiting way that requires intubation and mechanical ventilation. This is a case report of a myasthenic crisis in a 61-year-old woman that became complicated following a lack of response to plasmapheresis, intravenous immunoglobulin (IVIG) therapy, and the development of septic shock. The co-occurrence of myasthenic crisis and sepsis is a challenging condition. Many antibiotics cause flare-ups of myasthenia gravis. Infection and sepsis can exacerbate myasthenia. We discuss the successful management of certain unique challenges. To treat sepsis, drugs that may cause deterioration of myasthenia gravis, such as amikacin, ciprofloxacin, colistin, vancomycin, amphotericin B, and voriconazole were prescribed, but eventually the sepsis was cured. After eradicating the infections and stabilizing the patient's hemodynamic, she received rituximab. After 3 weeks of treatment, she responded well to the rituximab, the respiratory failure recovered, and she was extubated and discharged from the ICU after 3 months of hospitalization. This report demonstrates that when the myasthenic patient is under mechanical ventilation, can use even cautionary drugs.

Introduction

Myasthenia gravis (MG) is an autoimmune and heterogenic disease in which different types of antibodies are produced against motor receptors in the neuromuscular junction [1]. The diagnosis of myasthenia gravis relies on the patient's medical history, physical examination, and the presence of autoantibodies targeting acetylcholine receptors (AChRs) [2]. It is estimated that around 10% to 20% of individuals with myasthenia gravis may encounter at least one crisis during their lifetime, with an annual risk of approximately 2% to 3% [3]. The exacerbation of MG can be triggered by several different medications. Autoimmunity can be triggered by drugs, leading to symptomatic MG. Additionally, numerous drugs can negatively impact the transmission at the neuromuscular junction, potentially worsening MG symptoms. These drugs may also cause MG crisis or reveal previously

The authors declare no conflicts of interest.

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undiagnosed MG [4]. Therefore, drug selection in myasthenia gravis is challenging. A fast-acting immunomodulatory treatment, such as intravenous immunoglobulin or plasma exchange, is used to directly eliminate or neutralize the autoantibodies in the bloodstream [5-6]. A thymectomy is a treatment option for patients diagnosed with thymomas [7].

Case Report

We present a case of MG crisis in a 61-year-old woman. She had been stable on Mycophenolate mofetil, Prednisolone, and Pyridostigmine for several years. She presented to the emergency department with progressive dyspnea, ptosis, and fatigue. She deteriorated within 24 hours of admission; requiring intensive care unit (ICU) admission and intubation. Antibody titers against acetylcholine (AChR antibody) were 0.2 nmol/l and anti-muscle-specific kinase (anti-MuSK) antibodies were 20 nmol/L. she was treated with five sessions of plasmapheresis and intravenous immunoglobulin (IVIG), however, there was no improvement in the patient's condition. She was a candidate for rituximab, but active infections and septic shock prevented its administration. Because of long-term hospitalization and intubation in the ICU, she has developed several resistant infections such as Acinetobacter baumannii in the lungs and Methicillin-resistant Staphylococcus aureus (MRSA) in the site of hemodialysis catheter and non-albicans candida species in the urinary tract. Another challenge we faced was that some medications can aggravate myasthenia gravis. for example, colistin (Polymyxin E), aminoglycosides, vancomycin, voriconazole, and ciprofloxacin may induce or aggravate Myasthenia Gravis. Finally, to eradicate carbapenem-resistant Acinetobacter baumannii we used a combined treatment regimen of colistin, amikacin, rifampin, and meropenem. To treat MRSA at the hemodialysis catheter site we used vancomycin and rifampin and we considered voriconazole and amphotericin B combination to treat non-albicans candida species. After successful antimicrobial treatment, the patient's sepsis was resolved, and she received rituximab. Fortunately, 3 weeks after receiving rituximab, the patient responded well, she was extubated and discharged from the ICU.

Discussion

Patients with MG have a significant risk of serious infections compared with age/sex/region-matched controls [8]. Mortality following sepsis and carbapenem-resistant Acinetobacter baumannii infection is 25% and 33%, respectively [9-10]. Unfortunately, many classes of antibiotics have deleterious effects on neuromuscular transmission, leading to increased MG weakness [4]. But fortunately, drug-induced muscle weakness is self-limiting and reversible [11]. Even though simultaneous administration of colistin and amikacin is worrisome in terms of nephrotoxicity and exacerbation of myasthenia gravis, sepsis is more life-threatening [12]. Therefore, the small possibility of drug side effects should not make us forget the fatal risk of sepsis. On the other hand, infections are considered as flare-ups of myasthenia gravis [13]. Rifampin has several advantages in this case, for example, is a safe drug in myasthenic patients, has synergistic effects with colistin, and is also effective in eliminating MRSA [14-17]. Therefore, the combined treatment of colistin, rifampin, amikacin, vancomycin, and meropenem was used to eradicate resistant Acinetobacter baumannii and MRSA. The complication of muscle weakness caused by voriconazole and amphotericin B is very rare [18]. Mortality of non-albicans bloodstream Infections is about 45 percent [19]. Again, the potential risk of non-albicans infection was greater than the drug complication. The average 30-day mortality rate from MRSA bloodstream infections is 16 to 44% [20].

Conclusion

This report demonstrates that when the myasthenic crisis patient is under mechanical ventilation, we can use even cautionary drugs. Although the administration of Some antibiotics in myasthenia gravis may prolong the length of hospitalization, the fatal risk of sepsis should not be neglected.

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