Case Report / Olgu Sunumu

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Elderly patient diagnosed with myasthenia gravis with recurrent failed weaning and prolonged apnea

Tekrarlayan başarısız weaning ve uzamış apne ile tanı konulan yaşlı myastenia gravis hastası

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ABSTRACT

Myasthenia gravis (MG) is a chronic autoimmune neuromuscular disorder caused by the development of antibodies to nicotinic acetylcholine receptors. The disease characterized by variable muscle weakness worsening with exercise.

Although most patients have neurological signs and symptoms, respiratory symptoms occur in the late stages of the disease. However, rarely, respiratory failure may be the first symptom in some undiagnosed patients. We report the case of an elderly patient who was admitted with respiratory failure and intubated and transferred to the internal medicine intensive care unit. Two days after intubation, when she was awake and met the extubation criteria, endotracheal tube was successfully removed. At this time, her vital signs were normal. However, next day, her arterial blood gas CO2 rose and he became drowsy, requiring re-intubation. This situation repeated on the fifth and 16th days of her hospitalization and prolonged apnea was observed after intubation with rocuronium. All other causes of failed extubation, such as sepsis and pneumonia, were ruled out. During follow-up, ptosis was detected in the right eye and acetylcholine receptor antibody was positive. On the 30th day of the follow-up, methylprednisolone 1mg/kg and pyridostigmine 240 mg/day was initiated. The patient, whose spontaneous respiration was sufficient, was extubated and taken to the neurology clinic for further examination and treatment.

Keywords: Myasthenia gravis, prolonged apnea, rocuronium bromide.

ÖZ

Myastenia gravis (MG), nikotinik asetilkolin reseptörlerine karşı antikorların gelişmesinden kaynaklanan egzersizle kötüleşen değişken kas güçsüzlüğü ile karakterize kronik otoimmün bir hastalıktır. Hastaların çoğunda nörolojik belirti ve semptomlar bulunsa da, solunum semptomları hastalığın geç evrelerinde ortaya çıkar. Nadiren MG tanısı konulmamış hastalarda solunum yetmezliği ilk semptom olabilir. Bu yazıda solunum yetmezliği ile başvuran ve entübe edilerek dahiliye yoğun bakım ünitesine nakledilen yaşlı bir hastayı sunuyoruz. Entübasyondan iki gün sonra, uyanıkken ve ekstübasyon kriterlerini karşıladığında extübe edilen hastanın bu sırada hayati belirtileri normaldi. Ancak ertesi gün arteriyel kan gazında karbondioksit (CO2) yükseldi ve hasta uykulu hale geldi, bu nedenle yeniden entübe edildi.

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Bu durum yatışının beşinci ve 16. günlerinde tekrarladı ve roküronyum ile entübasyon sonrası uzamış apne gözlendi. Sepsis ve pnömoni gibi başarısız ekstübasyonun diğer tüm nedenleri dışlandı. Takiplerinde sağ gözde pitozis saptandı ve asetilkolin reseptör antikoru pozitifti. Takibinin 30. gününde metilprednizolon 1mg/kg ve piridostigmin 240 mg/gün başlandı. Spontan solunumu yeterli olan hasta ekstübe edilerek ileri tetkik ve tedavi için nöroloji servisine alındı.

Anahtar Sözcükler: *Myastenia gravis, uzamış apne, roküronyum bromid.*

INTRODUCTION

Myasthenia Gravis (MG) is a rare autoimmune disease of the neuromuscular junction which results in generalized weakness. MG patients usually present with painless, certain muscle involvement and weakness. Weakness is seen in extraocular, bulbar or proximal extremity muscles. Symptoms usually progress to include limb muscles (1). Respiratory failure may be a complication in approximately 3 to 8% of cases in the late stage of MG (2). However, isolated respiratory failure as present as in this case are very rare.

Neuromuscular blocking agents (NMBAs) are usually given during anesthesia to facilitate endotracheal intubation. Patients with MG are unpredictably sensitive to these agents. NMBAs should be used with caution in patients with MG. These agents should be titrated to act as directed by a quantitative neuromuscular monitor whenever possible. If sugammadex is not available, NMBAs should be avoided unless absolutely necessary (3).

Here we present an elderly female patient who had prolonged apnea after intubation with rocuronium bromide and failed repeated weaning attempts.

Case Presentation

A 76 year-old female patient was brought to the emergency room by relatives with complaints of cough, sputum, wheezing, and shortness of breath. Symptoms began approximately one week before and had progressively worsened. Past medical history is significant for hypertension and chronic obstructive pulmonary disease (COPD). Her current medications include salbutamol 4x1 thiotropium bromur 18 mcg 4x1 theophylline 200 mg 1x1 inhaler, amlodipin 10 mg 1x1 per oral (p.o.)

In the first evaluation, she was confused, hypotensive, with tachypnea, and hypoxic. She was transferred to the internal medicine intensive care unit (ICU), intubated and mechanically ventilated. In the blood test performed at the time of admission to the hospital, creatinine, C-reactive protein (CRP) and creatine kinase elevations and leukocytosis were observed (Table-1).

Thorax computed tomography (CT) revealed parenchymal infiltration in the right upper lobe posterior segment, left lower lobe postero-basal segment and latero-basal segments. Bilateral minimal pleural effusion and fibroatelectasis were observed (Figure-1).

The patient was started on meropenem 2x500 mg iv linezolid 2x600 mg iv oseltamivir 4x75 mg p.o. with the preliminary diagnosis of community-acquired staphylococcal pneumonia and influenza pneumonia.

Table-1. Laboratory findings at the time of admission.

Variable	Patient's Data	Normal Range
Serum		
Creatinine (mg/dL)	2,72	0,7 – 1,2
Creatine kinase (U/L)	1520	0 - 200
C-reactive protein (mg(dL)	17,2	0 – 0,5
Albumin (g/dL)	3	3,5 – 5,2
WBC (cells/mm³)	20100	4000 - 10000

WBC: White Blood Cells

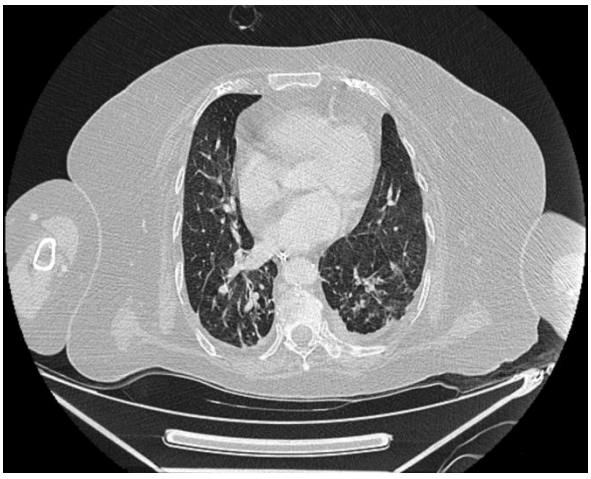

Figure-1. Thorax computed tomography (CT) revealed parenchymal infiltration and bilateral minimal pleural effusion

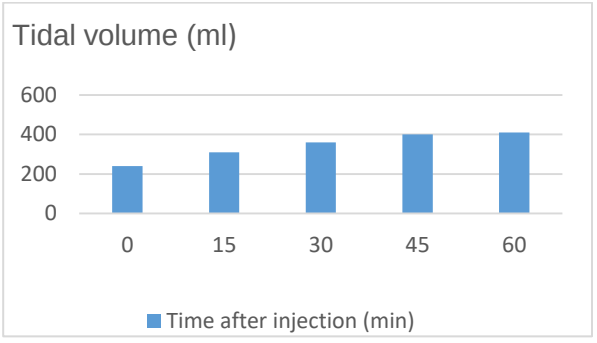

Figure-2. The neostigmine test. The patient was on mechanical ventilation; we evaluated the tidal volume after the intramuscular injection of neostigmine. After the neostigmine 5 mg injection, the tidal volume increased from 240 mL/min to 410 mL/min

Two days after intubation, when she was awake, normotensive without inotropic drug and met the extubation criteria, endotracheal tube was successfully removed. At this time, her vital signs were normal. Next day, arterial blood gas revealed hypercapnia and she needed non-invasive mechanical ventilation. She was intubated hours later due to worsening respiration. This situation repeated on the fifth and 16th days of her hospitalization. *S. aureus* and H1N1 was isolated from tracheal culture samples. She didn't developed fever.

On the ninth day of the follow-up, ptosis was detected in the right eye. Neurological consultation was done due to ptosis of right eye worsening during the evening hours with preliminary diagnoses of Myasthenia Gravis (MG). Acetylcholine antibody titers were 8.8 nmol/L. After the neostigmine 5 mg injection, the tidal volume increased from 240 mL/min to 410 mL/min (Figure-2).

On the 16th day of the follow-up, she was re-intubated after being extubated because of her hypercapnia state. Since she was conscious, rocuronium bromide 20 mg was given.

Although spontaneous motor movements of hands and feet returned, spontaneous respiration was not triggered. Sugammadex 200 mg was given due to the possibility of residual neuromuscular blockade after rocuronium bromide. Spontaneous breathing was detected at 22 hours. Weaning attempts failed for another 2 weeks. The dose of pyridostigmine was increased to 240 mg/day and methylprednisolone 1 mg/kg/ day was added to the treatment.

On the 30th day of the follow-up, methylprednisolone 1mg / kg pyridostigmine 240 mg / day treatment ptosis recovered and the patient's respiratory parameters were within normal limits. The patient with adequate spontaneous respiration was extubated and was externed to the neurology clinic for further examination and treatment.

DISCUSSION

Myasthenia gravis patients usually present with painless, certain muscle involvement and weakness. Weakness is seen in extraocular, bulbar or proximal extremity muscles. Symptoms usually progress to include limb muscles (1).

Although respiratory failure commonly occurs during the course of MG, respiratory failure is rarely described as the presenting symptom of MG. However, Berrouschot et al. in a review of 44 patients with myasthenic crisis observed that respiratory failure was the first manifestation in 8 (18%) patients (4).

A number of conditions and factors can exacerbate myasthenic symptoms and trigger such a myasthenic crisis, for example infections. Our patient had COPD and there were signs of pneumonia on thorax CT. However, after antibiotherapy despite meeting the extubation criteria, weaning attempts failed each time or respiratory failure developed again sometime after extubation. Extubation failure in patients with MG may be related to the patient's age, underlying diseases, and infection status. Elderly patients with MG are at particular risk from prolonged ventilation and extubation failure (5).

We observed prolonged apnea after intubation with rocuronium. Myasthenic patients, in whom the effects of neuromuscular blockers are rather unpredictable, are at increased risk for residual block and prolonged ventilation support. The presence of neuromuscular diseases should be kept in mind in cases of prolonged apnea after intubation. Since we did not know that our patient had myasthenia gravis, sugammadex was not given after intubation with rocuronium. In a retrospective database review that compared postoperative outcomes in over 1100 patients with MG who underwent thymectomy, postoperative complications were similar in patients who received rocuronium with sugammadex reversal versus no NMBA (6). In the study of Dontukurthy et al., in which they examined the case reports of myasthenia gravis in which neuromuscular blockade was created with rocuronium, it was shown that neuromuscular blockade was successfully reversed with sugammadex at a dose of 2-4 mg/kg (7).

When the long-term apneas of our patient and these studies are evaluated together, it can be said that if sugammadex is not available in patients with MG, neuromuscular blocking agents should be avoided if possible, but rocuronium can be used safely in the presence of sugammadex.

CONCLUSIONS

Patients with respiratory failure may have unrecognized MG. It is particularly important to attempt to obtain a history of extraocular or bulbar weakness or previous unexplained respiratory failure. On examination, ptosis, extraocular muscle or bulbar weakness in patients with respiratory failure should suggest MG.

Neuromuscular blockade should be avoided in patients with MG. If rocuronium, one of the non-depolarizing agents, is used as needed, then sugammedex will prevent prolonged apnea.

Conflict of interest statement: The author have no conflicts of interest to declare

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