CASE REPORT

Bali Medical Journal (*Bali MedJ)* 2021, Volume 10, Number 1: 314-319
P-ISSN.2089-1180, E-ISSN: 2302-2914

Bali Medical Journal
www.BaliMedicalJournal.org
Published by Bali Medical Journal

Myasthenia gravis and arrhythmias in COVID-19: a case report

Dodik Tugasworo[1*], Aditya Kurnianto[1], Retnaningsih[1], Yovita Andhitara[1], Rahmi Ardhini[1], Daynuri[1], Jethro Budiman[1]

[1]Department of Neurology, Faculty of Medicine, Universitas Diponegoro-Dr. Kariadi Hospital, Semarang, Indonesia.

*Corresponding author:
Dodik Tugasworo;
Department of Neurology, Faculty of Medicine, Universitas Diponegoro-Dr. Kariadi Hospital, Semarang, Indonesia;
dodiktugasworo2020@gmail.com

Received: 2021-01-04
Accepted: 2021-04-20
Published: 2021-04-30

ABSTRACT

Background: Myasthenia Gravis (MG) is an autoimmune disorder, which autoantibodies against postsynaptic (muscle) nicotinic acetylcholine receptors (nAChR). MG patients have a higher prevalence of cardiac manifestations in the presence of thymoma. It is not known whether Coronavirus disease 2019 (COVID-19) can cause more severe illness in patients with chronic neuromuscular disorders such as MG, which can cause respiratory muscle weakness, or in those who are immunosuppressed. This case report will discuss patient with MG, thymoma, atrial fibrillation, and COVID-19.

Case presentation: A 60-year old man came to the hospital with difficulty of swallowing. He had nasal voice and dropping of eyelids. These complaints were happened repeatedly, worsened at night and got better in the next morning. From the neurological examination, it was also obtained Wartenberg test (+), counting test (+), and prostigmine test (+). Atrial fibrillation was found with normal ventricular response and decreased systolic left ventricular function on the electrocardiogram and echocardiography. On the chest MSCT, a lobulated homogeneous solid mass was found in anterior mediastinum which supported the image of thymoma, and there was the imaging of typical viral pneumonia. The patient also had the positive result of COVID-19 PCR test.

Conclusion: MG patients have been shown with abnormal manifestations of heart rhythm. This may reflect as a complication of myocarditis or autonomic nervous system dysfunction. COVID-19 infection in MG can be challenging for many reasons. Current guidelines recommend continuing the current standard care treatment of MG during hospitalization.

Keywords: atrial fibrillation, autoimmune, COVID-19, myasthenia gravis, thymoma.
Cite This Article: Tugasworo, D., Kurnianto, A., Retnaningsih., Andhitara, Y., Ardhini, R., Daynuri., Budiman, J. 2021. Myasthenia gravis and arrhythmias in COVID-19: a case report. *Bali Medical Journal* 10(1): 314-319. DOI: 10.15562/bmj.v10i1.2168

INTRODUCTION

Myasthenia Gravis (MG) is an autoimmune disease that autoantibody against nicotinic acetylcholine receptor (nAChR). This blockade and downregulation of nAChR reduce nerve impulses that can generate muscle action potentials.[1–3] The incidence of MG is 5-30 cases per 1 million per year with a prevalence of 10-20 cases per 100,000 population. MG mostly occur at the age of 30-50 years with the majority gender is woman.[1–c] Myasthenia gravis is a progressive disease with high mortality rate in the first 2 years, which is about 5%.[1–4]

Thymus abnormalities are common in MG patients. About 10% of MG patients are associated with thymoma. Most thymomas can produce T cells.[6-8] MG is an autoimmune disorder related to T cells and B cell-mediated. MG requires CD4+ T cells (T helper cells) for the production of autoantibodies against nAChR. T helper cells produce inflammatory cytokines that induce autoimmune reactions to self-antigens and eventually activate B cells. nAChR antibodies will activate the post-synaptic complement sequence of muscle surfaces.

Furthermore, nAChR antibodies will react with nAChR and increasing endocytosis and degradation. nAChR antibodies will then inhibit nAChR activation by blocking nAChR binding sites or inhibition of ion channel gate opening. The decrease of nAChR activation will decrease the motor endplate. Skeletal muscle weakness arises from a reduced potential in the motor endplate so that the muscle cannot generate an action potential and cannot stimulate muscle fiber contraction.[6,7,9] MG is known to involve other body systems including the heart. MG patients have a higher prevalence of cardiac manifestations in the presence of thymoma.[10] The cardiac manifestations of MG are associated with immunological response against myocardium and interfering cardiac conduction.[10-12]

Coronavirus disease 2019 (COVID-19) has rapidly developed into a global pandemic. Respiratory failure and COVID-19-related death were driven in part by a massive inflammatory response.[13] Neurological sequelae, including cerebrovascular events, impaired consciousness, skeletal muscle injury, and meningoencephalitis, can complicate the disease.[14] It is not known whether COVID-19 causes more severe disease in patients with chronic neuromuscular disorders such as MG, which can lead to