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Case Report

Post-COVID-19 Dermatomyositis: A Delayed Reaction That Evades Early Detection

COVİD-19 Sonrası Dermatomiyozit: Erken Teşhisten Kaçan Gecikmiş Bir Reaksiyon

Nur Ili Syazwani MD HADIS[1], Siti Suhaila MOHD YUSOFF[1], Rosediani MUHAMAD[1], Fatin Hanani CHE JUHA[2]

[1]Universiti Sains Malaysia School of Medical Sciences, Department of Family Medicine, Kubang Kerian, Malaysia
[2]Klinik Rawatan Keluarga, Hospital Universiti Sains Malaysia, Kubang Kerian, Malaysia

ABSTRACT

Dermatomyositis (DM) is a rare autoimmune disease that causes symmetrical and predominantly proximal muscle weakness in the limbs and typical skin lesions. Its prevalence increased during the coronavirus disease-2019 (COVID-19) pandemic. Viral infections may cause autoimmunity and trigger the pathogenesis of myositis. We present the case of a man with a long history of myalgia and muscle weakness, who was initially diagnosed with post-COVID-19 myalgia and subsequently developed progressive muscle weakness. Biochemical and muscle biopsy results confirmed DM. The patient responded favorably to the course of steroid treatment.

Keywords: Dermatomyositis, immunity, COVID-19

ÖZ

Dermatomiyozit (DM), ekstremitelerde simetrik ve ağırlıklı olarak proksimal kas güçsüzlüğüne ve tipik deri lezyonlarına neden olan nadir bir otoimmün hastalıktır. Koronavirüs hastalığı-2019 (COVİD-19) pandemisi sırasında prevalansı artmıştır. Viral enfeksiyonlar otoimmüniteye neden olabilir ve miyozit patogenezini tetikleyebilir. Çalışmamızda uzun bir miyalji ve kas güçsüzlüğü öyküsü olan, başlangıçta COVİD-19 sonrası miyalji tanısı konan ve ardından ilerleyici kas güçsüzlüğü gelişen bir erkek olgusunu sunuyoruz. Biyokimyasal ve kas biyopsisi sonuçları DM'yi doğruladı. Hasta steroid tedavisine olumlu yanıt verdi.

Anahtar kelimeler: Dermatomiyozit, bağışıklık, COVİD-19

INTRODUCTION

Since its outbreak in December 2019 in Wuhan, China, a novel infection known as coronavirus disease-2019 (COVID-19) has shaken the world and affected global health. Symptoms of COVID-19 range from mild illness to death. The host must have a strong immune response to combat COVID-19. An excess in inflammatory responses in some patients leads to catastrophic COVID-19 outcomes[1]. According to the literature, half of the people with COVID-19 have myalgia, and COVID-19 causes myositis. Rashes, muscular weakness, and interstitial lung disease are symptoms of COVID-19-induced dermatomyositis (DM). Early diagnosis is difficult in COVID-19-induced DM due to the similarity between its symptoms and post-COVID-19 symptoms. Numerous studies have reported that COVID-19 causes autoimmune diseases[1]. Even as a new virus, it has been linked to autoimmune diseases such as Guillain-Barré syndrome, autoimmune hemolytic anemia, and autoimmune and rheumatic musculoskeletal diseases[1,2].

CASE REPORT

A 35-year-old man with well-controlled diabetes, hypertension, and fatty liver disease presented with rashes on his face for 5 months and myalgia for 3 months. In January 2021, he was diagnosed with category 2 COVID-19 and hospitalized for 14 days. Two months after the COVID-19 infection, he developed a pale hairline

Address for Correspondence: S.S. Mohd Yusoff, Universiti Sains Malaysia School of Medical Sciences, Department of Family Medicine, Kubang Kerian, Malaysia
E-mail: drsuhaila@usm.my **ORCID ID:** orcid.org/0000-0003-1149-5531

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flaking lesion over his forehead and brows (Figure 1). The rashes persisted, but he did not seek treatment.

Two months later, after receiving the second dose of the COVID-19 vaccine in May 2021, he noticed a new redness on the skin around his eyelids and both upper cheeks. The rashes were neither painful nor irritating. In addition, rashes over both his palm and fingers started to appear. These symptoms did not improve even after 2 weeks of topical steroid cream. He went to many clinics for treatment and was diagnosed with an adverse reaction to the COVID-19 vaccine. He began experiencing myalgia and proximal muscle weakness of both lower legs, in addition to new rashes. His symptoms worsened over time and began to interfere with daily living. The weakness started in both thighs and gradually radiated to his calf. After 3 months of muscle weakness, he started having difficulty swallowing food and appetite loss, which led to a 12-kg weight reduction within 2 months. However, there was no history in his family of prolonged fever, mouth ulcers, photophobia, hypo- or hyperthyroid symptoms, or cancer or connective tissue disease.

The patient was comfortable, he is not pale and afebrile and had normal vital signs during routine clinic appointments for his chronic disease. The rash on his face looked dry. There was an uneven border of reddish to purplish maculopapular rashes on the palms of both hands, proximal interphalangeal joints, middle interphalangeal joints, and extensor part of the left knee joint (Figure 2a, b). No evidence of oral ulcers or lymphadenopathy was found. The pre-appointment blood investigation revealed normal kidney and lipid profiles but persistent liver enzyme abnormalities, with aspartate transaminase (AST) of 392 mmol/L, alanine aminotransferase (ALT) of 316 mmol/L and alkaline phosphatase of 78 mmol/L. To rule out connective tissue disease, complete blood count (CBC) and tests for estimated sedimentation rate (ESR), creatinine kinase (CK), and anti-nuclear antibodies (ANA) were performed.

During his second visit, his CK level was 10,746 U/L, and his ANA was positive. A significant clinical suspicion of DM led to his admission. By contrast, his CBC and ESR results were both normal. Subsequently, a muscle biopsy was performed, followed by blood sampling for myositis panel and enzyme immunoassay (ENA). He was prescribed 60 mg prednisolone daily (1 mg/kg/day). CK levels dropped to 5,957 U/L after 6 days of steroid therapy. His myalgia improved after discharge with 60 mg prednisolone taken orally OD for a month. An additional test to rule out other differential diagnoses

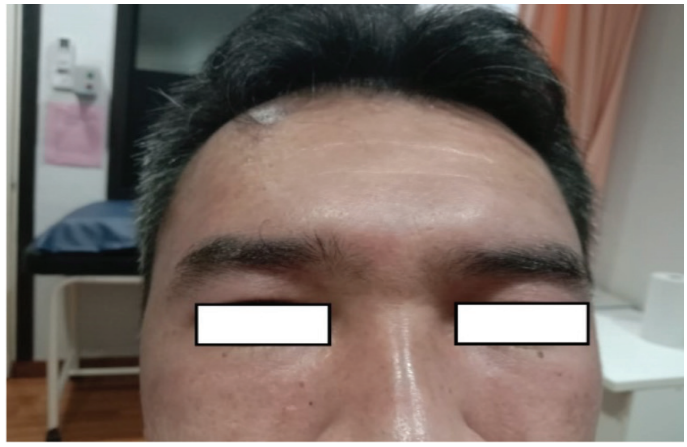

Figure 1. Whitish flaky lesion over the hairline; redness over upper cheek.

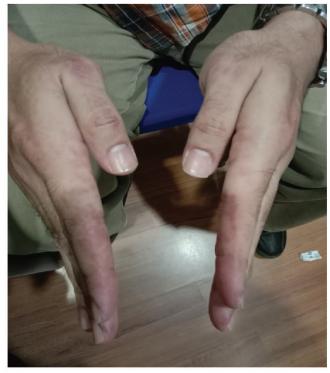

Figure 2a

Figure 2b

Figure 2a, b. Reddish to purplish maculopapular rashes seen on the palms of both hands, proximal interphalangeal joints, and middle interphalangeal joints.

was insignificant. In the follow-up, ENA revealed positive results for Mi-2, a-M2 alpha, and anti-M2 beta (specific). A biopsy of the right vastus lateralis revealed muscle fiber fascicles in cross- and longitudinal sections. The fascicles were surrounded by loose fibrocollagenous perimysial connective tissues. Predominantly, the muscle fibers were composed of fairly uniform, polyhedron-shaped peripherally located nuclei. Lymphocytic infiltrations are seen predominantly in the perimysial area with a few in the endomysial area. Muscle fibers also contain perifascular atrophic fibers. No rimmed vacuole inclusion, marked fiber hypertrophy, or splitting was found, which is consistent with features of DM.

Written informed consent was obtained from the patient for the publication of this case report.

DISCUSSION

DM is a chronic inflammatory myopathy that affects 9.3 per million people. Dysregulated or dysfunctional immune systems, predisposed genes, and environmental factors all contribute to the development of autoimmune diseases[3]. Viral infections also cause autoimmune diseases in people with a genetic predisposition to the disease. Viruses such as parvovirus B19, Epstein-Barr, cytomegalovirus, Herpes virus-6, HTLV-1, hepatitis A and C, and rubella were previously thought to be autoimmune disease triggers[4]. Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) and autoimmunity may be linked via molecular mimicry and bystander activation[2,4]. Interestingly, in autoimmune DM, three immunogenic linear epitopes with strong sequence similarity to SARS-CoV-2 proteins were discovered[5]. Furthermore, the SARS-CoV-2 receptor known as angiotensin converting enzyme-2, was also found to be expressed in skeletal muscles[6]. Regarding COVID-19, a systemic review found four articles that report new diagnoses of idiopathic inflammatory myopathies (IIMs), and two groups provide anecdotal evidence of an increase in new cases of IIMs during the pandemic[7]. However, this relationship has not been fully uncovered, so further studies are needed.

Classical DM presentation includes distinctive skin features that precede or are accompanied by muscular weakness[6]. COVID-19-induced DM exhibits the same symptoms as classical DM. Therefore, it would be difficult to tell the symptoms of one from the other. This challenge is further exacerbated by the fact that the most prevalent COVID-19 symptoms are muscle pain and weakness[8]. COVID-19 and DM symptoms are similar, rendering early diagnosis a challenge. In this case, the muscle weakness of our patient was considered a post-COVID-19 symptom that contributed to the delay in the diagnosis. The presence of pathognomonic DM findings, including Gottron's papules/signs, may aid diagnosis. They are described as erythematous to violaceous papules or macules, occasionally with scale, which develop symmetrically over the extensor surfaces of joints, such as the elbows, knees, and metacarpophalangeal joints, and are present in two-thirds of patients with DM. Moreover, heliotrope eruption is the most distinctive skin feature. It is characterized as an erythematous to violaceous patch on the upper eyelids, which may be accompanied by periorbital edema[9]. Unfortunately, in the present case, the absence of typical rashes made diagnosis more difficult.

Apart from the classic DM clinical characteristics of bilateral muscular weakness and rash, elevated muscle enzymes such as CK, aldolase, myoglobin, lactate dehydrogenase, AST, and ALT and the presence of myositis-specific autoantibodies (MSA) aid in the diagnosis of DM. An anti-Mi-2 antibody is the most prevalent MSA discovered in these patients and is linked to classical DM[10]. The presented patient had progressive muscle weakness, dysphagia, systemic erythematous rashes, and a positive anti-Mi-2 antibody. DM pathology was discovered after a muscle biopsy.

Given the rarity of this disease, diverse clinical presentations, and involvement of many organ systems, treating DM is a challenge. As there is a lack of information from randomized control trials, no therapy guidelines have been established[11]. Many immunomodulators and immunosuppressants have had conflicting results regarding their efficacy as monotherapies; thus, systemic corticosteroids are still regarded as the best first-line treatment[11]. Corticosteroids were frequently reported to improve muscle strength and restore normal levels of muscle enzymes. Acceptable initial doses of prednisolone range from 0.5 to 1 mg/kg/day for at least 1 month, followed by a gradual dose reduction to achieve the minimally effective dose based on an improvement in muscle function. Unfortunately, disease remission frequently requires long-term therapy (6-12 months). Thus, side effects from prolonged steroid usage should be monitored. In this case report, the patient received 1 mg/kg/day prednisolone and showed improvement in symptoms and muscle enzyme after 6 days of treatment. The same steroid dose was then continued for 1 month before tapering was made weekly as the patient's condition improved.

Some people have symptoms that last 6 months or even longer after recovery from COVID-19. While the most common signs of the illness seen so far are fever, cough, and sore throat, published case reports have recently begun to highlight more unusual and uncommon manifestations of COVID-19[8]. The long-term consequences of COVID-19 have not been routinely monitored by surveillance systems. Primary care clinicians will handle the majority of post-COVID sequelae, sometimes in combination with pre-existing or new comorbidities, possibly increasing the COVID-19 load on primary care[12]. Autoimmune illness can develop over an extended period following infection[13]. In the present case, the symptoms were initially mild and deteriorated within a few months. Several medical visits have not resolved his condition. The patient's condition was also misinterpreted as post-COVID syndrome, as myalgia is the most common symptom. His rashes were diagnosed as an adverse response to the COVID-19 vaccine. Thus, in-depth history taking is critical. Post-COVID symptoms

usually improve with time and resolve spontaneously. New or worsening symptoms require further evaluation, since they may indicate long-term consequences[12].

Primary care doctors should be aware of any COVID sequelae because we need to live with this virus. This case report demonstrates the need for a treating physician to schedule a follow-up session with a patient to examine symptoms rather than just reassure the patient that they will recover from their symptoms.

Ethics

Informed Consent: Written informed consent was obtained from the patient for the publication of this case report.

Peer-review: Externally peer-reviewed.

Author Contributions

Surgical and Medical Practices: N.I.S.M.H., S.S.M.Y., R.M., F.H.C.J., Concept: N.I.S.M.H., S.S.M.Y., R.M., F.H.C.J., Design: N.I.S.M.H., S.S.M.Y., R.M., F.H.C.J., Data Collection and/or Processing: N.I.S.M.H., F.H.C.J., Literature Search: N.I.S.M.H., S.S.M.Y., R.M., Writing: N.I.S.M.H., S.S.M.Y., F.H.C.J.

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