CASE REPORT

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Rare Presentation of Dermatomyositis with Haemophagocytic Lymphohistiocytosis

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Abstract

22-year-old male presented with fever, yellowing of the eyes and urine, rash, and had been unable to move since a week. Per-abdomen examination revealed splenomegaly. An evaluation of the nervous system revealed proximal myopathy more in lower limbs than the upper limbs. Routine laboratory tests revealed pancytopenia, abnormal liver function tests, elevated ferritin, elevated triglycerides, and reduced fibrinogen. Mixing studies revealed presence of inhibitors. Anti-MI 2 antibodies, Anti-KU antibodies, and SRP-borderline were positive in the myositis profile. Dermatomyositis was the underlying cause in the Haemophagocytic-lymphohistiocytosis (HLH) diagnosis. Although rare (4%), the connection of HLH with inflammatory myositis is deadly (77% mortality).

Key words: Haemophagocytic-lymphohistiocytosis, dermatomyositis, clotting factor deficiency.

Case report:

A student, aged 22, who had been experiencing body rashes, difficulty walking, a fever, and jaundice for a week presented to our emergency room. The patient first had difficulty in walking, but was able to do so with assistance. Over the course of a week; however, the patient's weakness worsened and he eventually became bedridden. He also reported a rash that spread to the torso ((Fig. 1), upper (Fig. 2) and lower limbs, which worsened over the course of two weeks. He also had a low-grade fever which had been present for 6 months, but had gotten worse over the last 2 weeks. The patient's eyes and urine had yellow discolouration since the past six months. There were no sensory or cranial nerve impairments. He had no concomitant conditions, wasn't a smoker or alcoholic, and ate a variety of foods.

Upon general inspection, erythematous rashes covered the upper, and lower limbs, and trunk, alongwith icterus and pallor. A thorough neurological evaluation revealed no cranial nerve impairments or sensory involvement and normal higher mental function. In the motor assessment, tone was normal, power was 2/5 in the lower limbs' proximal muscles and 4/5 in the upper limbs' and lower limbs' distal muscles. There was discomfort in the muscles. We were contemplating along the lines of inflammatory myositis. Laboratory tests revealed a haemoglobin level of 3.7 g/dL, a total white cell count of 2210/mm^3 predominately composed of neutrophils, and a platelet count of 25,000/

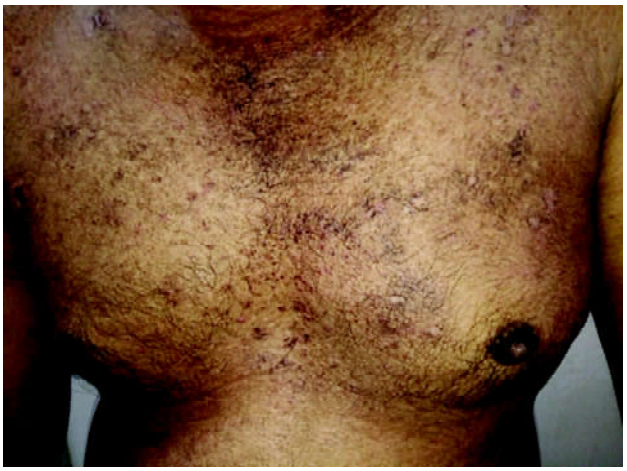

Fig. 1: *A rash spread over the torso.*

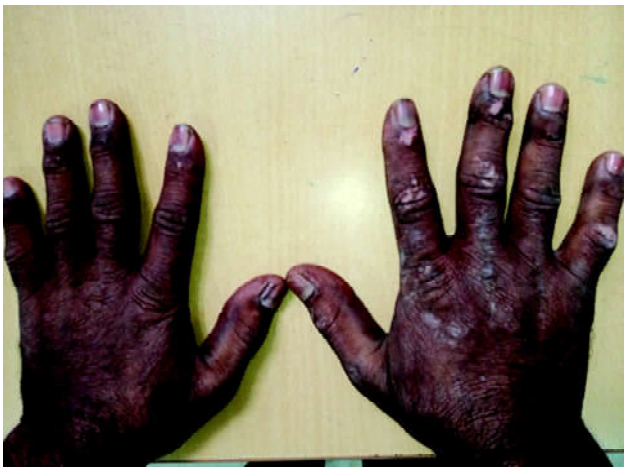

Fig. 2: *Gottron's papules over knuckles.*

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mm^3. Total bilirubin was 1.55 mg/dL and direct bilirubin was 1.50 mg/dL. Three times above average liver enzyme levels were observed. The aPTT with more than 3 minutes, PT/INR was 24.3/1.7. LDH was increased. He had a normal CK-MB. There was a small increase in CK-NAC. Triglycerides were 250 mg/dL and serum ferritin was 40,000 μg/L. Prior to admission, a bone marrow biopsy revealed normal haemopoietic cells as well as a small number of epitheloid and myeloid band formations, rendering it inconclusive. Anti-MI 2 antibodies, Anti-KU, and SRP-borderline were positive in the myositis profile. The results of a mixing study, which adjusted both the APTT and the PT, revealed presence of inhibitors. Steroids were started for the patient. Cyclosporine was added since the response was subpar. The patient was supported with PRBCs, FFPs, and RDPs transfusion. Because fibrinogen was low, cryoprecipitate was administered. Because of the patient's persistently low platelet count and increased PT and APTT, we were unable to perform a bone marrow biopsy. Patient was lost for follow-up after that.

Discussion

HLH is a hyper-inflammatory syndrome that can be primary or develop as a result of autoimmune conditions, infections, cancer, or other factors[1,2]. Despite improvements in the diagnostic evaluation of febrile[3] patients, HLH continues to be a potentially lethal disease entity and is difficult to diagnose. The pathogenesis includes excessive macrophage activation and dysregulated immune activation. The hallmarks of the immunologic abnormalities in HLH are the excessive production of proinflammatory cytokines, unchecked activation of T-cells, and macrophages and diminished natural killer cell and cytotoxic cell activities[5]. An excessive cytokine storm caused by macrophage activation in the host results in tissue damage and organ malfunction. Host factors or environmental chemicals may cause an excess of pro-inflammatory or inadequate anti-inflammatory responses, which in turn cause this cytokine storm[1]. As a result, HLH that develops in the presence of an underlying infection is referred to as reactive or secondary haemophagocytic syndrome or secondary HLH, while HLH that develops in the presence of an underlying rheumatologic disease, such as rheumatoid arthritis, is referred to as macrophage activation syndrome (MAS).

In individuals with juvenile idiopathic arthritis, SLE, adult-onset Still's disease, or other autoimmune disorders, case reports describing MAS have been recorded, but not with dermatomyositis[4,5,6]. All HLH cases should be classified based on origin and pathophysiology, according to human and murine studies, because therapy approaches for each case may differ[7]. However, all aetiologies result in an overproduction of ferritin. Immunosuppressive therapy is used in conjunction with vigorous treatment of the underlying illness to treat secondary HLH.

Clinicians across the world use the HLH-2004 standard protocol[8]. In lymph node and bone marrow biopsy samples, it is challenging to identify haemophagocytosis in the early stages of disease[9]. It is a frequent misperception that haemophagocytosis must be detected on immunological tissue or bone marrow biopsies in order to diagnose HLH[10,11]. Haemophagocytosis is not actually necessary for diagnosis[10,11]. Instead, a diagnosis must be made by determining whether an HLH-associated gene mutation exists or by fulfilling five of the following eight criteria: fever 38.5° C, splenomegaly, hypertriglyceridaemia, haemophagocytosis in the bone marrow, spleen, lymph nodes, or liver, low or absent natural killer cells, ferritin >500 ng/mL, elevated soluble CD25, and peripheral blood cytopenias.

Six of these criteria were met by our patient; thus we classified our case as HLH secondary to dermatomyositis[12]. The patient also exhibited a common factor pathway deficit, which was on intriguing co-morbidity.

Conclusion

The intriguing part of this case was that HLH secondary to Dermatomyositis was coupled with common pathway factor deficiency. HLH should be considered in all patients with inflammatory myopathies accompanied by cytopenias, aberrant LFTs, and high ferritin levels.

Declaration of patient consent: The authors certify that they obtained all appropriate patient consent forms. In the forms the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Sit by my side, do not plunder

An accidental apple falling in front of Newton,
Made him to think about gravitational force,
Same apple to a French lead him to discover phlogin,
Molecule of century for diabetes kidney and heart.
Much before Leopold seeing dad percussing wine bottle,
Propagated idea of using percussion in clinical medicine,
Woodpecker searching safe nest for her eggs,
Assessed with her beak hollow wood beneath.
Laennec watched the way kids talked each other,
Developed new technique of auscultation,
Precursor of stethoscope removing that sore,
No need keeping ears close to chest anymore.
A fungus overgrown in petri dish in a lonely lab,
Alexander Fleming discovered penicillin,
Far east Bose watching Mimosa reacting to touch,
Proved plants too are living thriving and growing.
A wire tied around stem of an inclining big tree,
Months later enveloped by its epithelial tissue,
This is how healing takes place in our body & tissues,
So said an Ortho Professor to his eager disciples.
Hibiscus buds detached from their stalk,
Blooming into bright red flowers hours after,
Tuberose attracting herds of humming bees,
Though kept aside from their mother stock.
Which is that powerhouse making them to blossoms,
Who prompted bees to collect nectar from bloom ?
All this reflects omnipresence of omnipotent,
Building block of that chip we are made of.
Peeled skin of arjuna tree countryside,
Telling aloud its utility in heart ailments,
People plucking red periwinkle flowers,
Others collect black plums for high sugar.
Umpteen hints dropped by mother nature,
So many clues containing ills without pills,
My dear remedies in plenty look and search,
Sit by my side do not plunder no besmirch.

– Dr Shridhar Dwivedi,
Senior Consultant Cardiologist,
National Heart Institute, New Delhi