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Case Report

An interesting case of COVID induced multi system inflammatory syndrome

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ABSTRACT

COVID-19 derives from infection with Coronavirus [severe acute respiratory syndrome (SARS)-CoV-2] is associated with high morbidity and mortality. These hazardous impacts are due to the release of a storm of pro-inflammatory cytokines and thrombogenic agents. Increasing evidences about multi organ involvement in COVID infection have started pouring in, where patients who either recovered from or had mild symptoms after COVID-19, exhibit diffuse multi organ related symptoms. We describe a case of a 23-year-old male who presented to emergency room with intermittent high-grade fever, sudden onset of breathlessness, giddiness and weakness. His COVID RTPCR was negative. He was unvaccinated but his covid antibodies were increased multifold. Further examination revealed active multi organ involvement which suggestive for multisystem inflammatory syndrome (MIS). With appropriate diagnosis and treatment patient improved clinically over a course of 3 weeks and discharged and is under regular follow up.

Keywords: COVID induced MIS, COVID-19, MIS, COVID complications

INTRODUCTION

SARS-CoV-2 has been responsible for more than twenty million infections and deaths throughout the world.[1] Several young patients presenting with hyper inflammatory syndrome, i.e., severe multi organ involvement, rapidly evolving into acute multi organ failure, several weeks after infection with SARS-CoV-2 are reported worldwide.[2,3] These patients present with a similar pattern of clinical symptoms consisting of persistent high grade intermittent fever (99%), gastrointestinal (94%) and neurological (68%) symptoms, elevated cardiac (75%) and inflammatory biomarkers (99%), and cytopenias (76%). The centre for disease control and prevention has named this multi-system inflammatory syndrome (MIS). It is estimated that around 35% of patients who have mild symptoms, not requiring hospitalisation develop post-COVID sequelae, regardless of co-morbidities.[4,5] Among these patients, 80% have been hospitalised with severe illnesses.[6,7] MIS is a complication of SARS-CoV-2 infection which is not very commonly come across and usually presenting at 6 weeks after the onset of the COVID-19 infection.[2] Any patient with the above mentioned clinical scenario should be thoroughly evaluated , as early diagnosis and treatment can prevent mortality.

CASE REPORT

A 23-year-old male patient with no known comorbidities, presented to ER with complaints of high-grade intermittent fever for 2 days, sudden onset of breathlessness-gradually progressing to NYHA GRADE 3 in 2 days. He had giddiness for 2 days and generalized weakness for the past one week. Patient had one episode of vomiting 2 days back. He didn't have any history of cough, chest pain, syncope, palpitations, loose stools.

Lab investigations revealed normal hemoglobin, platelet and white blood cell counts with neutrophilia. Patient had

elevated total bilirubin with transaminitis. Renal profile showed elevated urea and creatinine levels. Antibodies for HIV/HBSAG/HCV were negative. RTPCR for SARS-COV-2 was negative. But the COVID total antibody was highly positive and it was the most important breaking point of diagnosis since our patient was not vaccinated and had no history of any previous exposure. Dengue, leptospirosis, Scrub typhus were negative. There was no growth in blood and urine cultures.

Inflammatory markers were all highly elevated, ultrasound abdomen revealed bilateral mild pleural effusion. Chest Xray revealed homogenous opacities in the peripheries of both lung fields. CT chest revealed ground glassing noted in the superior and posterior basal segments of both lower lobes. Bronchoscopy revealed diffuse alveolar bleed seen in left lower lobe. ANA and ANCA were negative. Cardiac parameters such HS troponin I and BNP were significantly elevated but echocardiogram was normal with an LVEF of 59%.

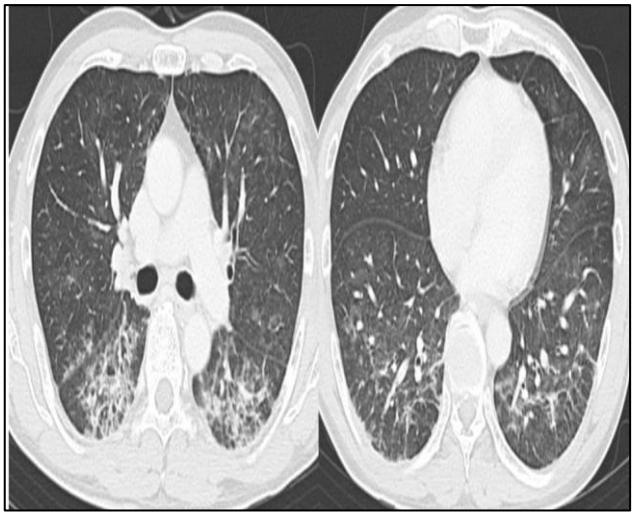

Figure 1: CT chest of ground glassing in bilateral lung fields.

Table 1: Clinical information/investigations laboratory investigations.

Laboratory investigations		
Complete blood picture	**Liver function test**	**Renal function test**
Hb-14.2 gm/dl	Total bilirubin-4.09 mg/dl	Urea-47 mg/dl
Platelets-1.8 L	SGOT-324 IU/L	Creatinine-3 mg/dl
Total counts-7980 cells/cu.mm	SGPT-176 IU/L	
Neutrophils-84%	ALP-98	
Serology	COVID RTPCR-Negative	
HIV-Negative	COVID total antibody-Positive	
HbsAg-Negative		
HCV-Negative		
Dengue serology-Negative	Blood culture-No growth	
Scrub typhus (IgM)-Negative	Urine culture-No growth	
Leptospirosis (IgM)-Negative		
Inflammatory markers	**Cardiac parameters**	
ESR-48 (normal <20)	HS trop I-17.9 (normal <14 ng/L)	
CRP-24 (normal <10 mg/dl)	BNP-9300 (normal <125 pg/L)	
Sr ferritin-667 (normal 25-330 mcg/L)	ECHO-Normal, LVEF-59%	
LDH-897(normal 105-350 IU/L)		
D-dimer->4200 (normal <500)		

CT chest-Ground glassing noted in the superior and posterior basal segments of both lower lobes. Bronchoscopy- Diffuse alveolar bleed seen in the left lower lobe.

In view of high-grade fever with breathlessness and hypoxemia, initially patient was stabilised and evaluated for pneumonia, but patient had deranged RFT with decreased urine output on day two for which he had to be managed with continuous renal replacement therapy, he also had significant LFT derangement, thus sepsis with multi organ dysfunction was suspected, RTPCR for covid was negative but CT chest showed bilateral consolidation changes. Patient was worsening quickly with multiple organ system involvement, his HS troponin-I and BNP was significantly elevated but echo showed no signs of any regional wall motion abnormality, with a normal LV and RV function and an LVEF of 59%. Viral myocarditis was suspected immediately and all auto immune workup for the same was done, but ANA and ANCA were negative, patient then tested positive for COVID-19 total antibody, considering that the patient was previously not infected or vaccinated, a high covid antibody count pointed towards suspecting COVID-19 induced multi system inflammatory syndrome, after consulting rheumatologist patient was immediately started on pulse therapy with methyl prednisolone for a course of three days, following which patient showed improvement and his repeat HS trop I came down to 6.1 from 17.9, with improvement in renal and lung functioning, patient was then slowly weened of ventilator support and had improved urine output with LFT normalizing, patient then improved clinically over a course of three weeks and was discharged on a tapering dose of steroids, patient came for review 1 week later and is under regular follow up.

DISCUSSION

SARS-CoV-2 causes a wide spectrum of illnesses ranging from an asymptomatic carrier state to multiple organ failure and death. Young adult patients manifesting as a hyper inflammatory syndrome were increasingly noticed during the post covid recovery time. The center for disease control (CDC) recently recognized the existence of a similar syndrome in adults as that of children and they coined it as MIS-Adult (MSIS-A).

The case definition of MIS-A is as follows: 1) In adults 21 years of age or older; 2) If fever persists for more than 3 days; 3) Two or more muco-cutaneous symptoms, gastrointestinal symptoms, hypotension, and neurological symptoms; 4) Elevation of inflammatory markers (ESR, CRP, ferritin, or procalcitonin); 5) Two or more readings of BNP elevation, neutrophilia/thrombocytopenia, clinical or echocardiography evidence of heart failure, or myo-pericarditis in EKG.[8] Our patient had similar features such as high grade fever, highly elevated inflammatory markers and gastrointestinal symptoms.

Most patients with MSIS presents with fever, shortness of breath, cardiac symptoms, elevated D-dimer level and lymphopenia. Our case had all these features along with renal involvement. The true incidence of MIS-A is very rare and scientific literatures have reported only 200+ such cases till now.[9] However, there are no widely accepted guidelines yet for the optimal therapeutic approach to young adults with MIS. Steroids are strongly recommended for patients with MIS-A to prevent further deterioration.[10]

CONCLUSION

MIS-A is associated with multi organ failure and sepsis, the rate of mortality and morbidity is extremely high. Since the presentation of such cases is extremely rare and not completely understood, it is very important to be aware of such a complication in patients with COVID infection. This patient is also unique in his presenting clinical features and thus shall help us abundantly in understanding MIS-A better and how early diagnosis and supportive treatment is very important to prevent mortality.

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REFERENCES

1. Johns Hopkins University and Medicine. Coronavirus resource center. Available at: Http://Coronavirus.jhu.edu/map.html. Accessed on 25 June, 2022.
2. Morris SB, Schwartz NG, Patel P. Case series of multisystem inflammatory syndrome in adults associated with SARS-CoV-2 infection-United Kingdom and United States, March-August 2020. MMWR Morb Mortal Wkly Rep. 2020;69(40);1450-56.
3. Theocharis P, Wong J, Pushparajah K. Multimodality cardiac evaluation in children and young adults with multisystem inflammation associated with COVID-19. Eur Heart J Cardiovasc Imaging. 2020;7;jeaa212.
4. Greenhalgh T, Knight M, A'Court M, Buxton M, Husain L. Management of post-acute COVID-19 in primary care. BMJ. 2020;370:m3026.
5. Tenforde M, Kim S, Lindsell C, Billig Rose E, Shapiro NI, Files DC et al. Symptom duration and risk factors for delayed return to usual health among outpatients with COVID-19 in a multistate health care systems network-United States. 2020. MMWR Morb Mortal Wkly Rep. 2020;69:993-8.
6. COVID-19-Long-Term-Health-Effects. Available at: https://www.gov.uk/government/publications/covid-19-long-termhealth-effects/covid-19-long-term-health-effects. Accessed on 7 May 2021.
7. Carvalho-Schneider C, Laurent E, Lemaignen A, Lemaignen A, Beaufils E, Bourbao-Tournois C et al. Follow-up of adults with noncritical COVID-19 two months after symptom onset. Clin Microbiol Infect. 2021;27:258-63.
8. Vogel TP, Top KA, Karatzios C, Hilmers DC, Tapia LI, Moceri P et al. Multisystem inflammatory syndrome in children and adults (MIS-C/A): Case definition and guidelines for data collection, analysis, and presentation of immunization safety data. Vaccine. 2021;39(22):3037-49.
9. Patel P, DeCuir J, Abrams J, Campbell AP, Godfred-Cato S, Belay ED. Clinical characteristics of multisystem inflammatory syndrome in adults: A systematic review. JAMA network open. 2021;4(9):e2126456.
10. Henderson LA, Canna SW, Friedman KG. American College of Rheumatology clinical guidance for multisystem inflammatory syndrome in children associated with SARS-CoV-2 and hyperinflammation in pediatric COVID-19. Arthritis Rheumatol. 2020;72:1791.

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