Wydawnictwo UR 2023
ISSN 2544-1361 (online)
doi: 10.15584/ejcem.2023.1.20

http://www.ejcem.ur.edu.pl
European Journal of Clinical and Experimental Medicine
Eur J Clin Exp Med 2023; 21 (1): 160–162

CASUISTIC PAPER

Case of multisystem inflammatory syndrome in adults

Hanna Dominik [1], Barbara Dominik [2]

[1] Medical University of Wroclaw, Wroclaw, Poland
[2] Department of Internal Medicine, University Hospital, Zielona Gora, Poland

ABSTRACT

Introduction and aim. Multisystem inflammatory syndrome in adults (MIS-A) is a rare severe illness which is related to prior SARS-CoV2 infection in individuals>=21 years old. The condition was described few months after recognition of similar entity in children known as MIS-C (United Kingdom, April, 2020). The diagnosis of MIS-A is based on clinical symptoms andevidence of inflammation in laboratory markers. It is characterized by extrapulmonary organ dysfunction (cardiovascular, gastrointestinal), general symptoms such as fever, malaise, rash and deviations in blood tests (elevated level of ferritin, procalcitonin, CRP, IL-6, D-Dimer) with a previous or current SARS-CoV-2 infection. The purpose of this study is to present the syndrome on the basis of a clinical case example, to show the course of the disease, its symptoms and the result of applied treatment.

Description of the case. The following case describes the clinical history, diagnostic process and applied treatment of 37-year old female patient who was admitted urgently to the hospital with a suspicion of sepsis originating from pharynx. The final diagnosis – MIS-A was settled after performing a broad panel of tests. Clinical picture was non- characteristic. The patient was successfully treated with steroids.

Conclusion. MIS-A is a rare clinical entity linked with SARS-CoV-2 infection. The symptoms manifest from multiple organ systems and the diagnostic process may be challenging. The illness can be successfully treated with steroids.

Keywords. fever, hypotension, MIS-A, lymphadenopathy, SARS-CoV-2, sepsis-like clinical picture

Introduction

COVID-19, even an asymptomatic form of the illness, is associated with the risk of developing a multisystem inflammatory syndrome- entity that can lead to severe complications, such as cardiac dysfunction, which was reported in most cases of MIS-A, shock, multiple organ failure and may trigger a rapid clinical deterioration. The pathogenesis of this inflammatory condition is not yet fully explained.[1]

Main symptoms include high fever, which can reach up to 40°C, polymorphic rash, conjunctivitis, tachycardia, hypotension, nausea, vomiting and diarrhea, with a relative absence of respiratory disease.[2,3]

Aim

The purpose of this study is to present the syndrome on the basis of a clinical case example, to show the course of the disease, its symptoms and the result of applied treatment.

Description of the case

The following case describes the clinical history, performed diagnostics and outcome of 37-year old female patient with a prior SARS-CoV-2 infection who presented sepsis-like picture on admission. The case fulfilled the Brighton Collaboration Case Definition for MIS-A. The diagnostic process was complicated, as it required the exclusion of other diseases and performance of many laboratory tests and imaging. Successful treatment involved

Corresponding author: Hanna Dominik, e-mail: hania.dominik31@gmail.com

Received: 19.11.2022 / Revised: 18.12.2022 / Accepted: 19.12.2022 / Published: 25.03.2023

Dominik H, Dominik B. *Case of multisystem inflammatory syndrome in adults*. Eur J Clin Exp Med. 2023;21(1):160–162. doi: 10.15584/ejcem.2023.1.20.

the use of steroids. 37-year old female patient was urgently admitted to the department of internal diseases to the University Hospital with a suspicion of sepsis. She was reporting high fever up to 40°C and shivers within the last four days, bilateral conjunctivitis, sore throat that impaired the regular intake of food and fluids. Three weeks earlier she was diagnosed on COVID- 19, which manifested with fever, general weakness, musculoskeletal pain. After 10 days from the onset of symptoms, cervical lymphadenopathy appeared. The patient was then consulted by a family doctor on-line. As a result she took azithromycin for three days. Her medical history was only noteworthy for asthma and Lyme disease (2006).Upon admission, the patient presented current body temperature 39.8°C, hypotension (90/60 mmHg) and tachycardia (110 bpm).Physical examination revealed increased neck circumference due to painful packages of enlarged cervical lymph nodes, reddish rash on the neck and legs, fungal lesions of the oral cavity, enlarged tonsils, minor crepitation in the basal parts of the lungs and slight tenderness in the epigastrium. Nasopharyngeal swab test for SARS-CoV2 upon admission was negative, nevertheless PCR test and the IgG antibody level test performed were positive. Due to her severe condition the patient receive dempiric therapy with i.v.antibiotics (vancomycin, meropenem) and antifungal(fluconazole). The blood and urine culture were negative. The laboratory test revealed elevated count of white blood cells $16.5x10^3/mm^3$, neutrophils $13x10^3/mm^3$ as well as significant increase of procalcitonin 1.63ng/ml (<0.5), CRP 389 mg/l (0-5.0), ferritin 1640,75 ng/ml (4.63-204), NTpro-BNP 7112pg/ml (<125) , D-Dimer 5771 ug/l (0-500) and Troponin I 53,6 ng/l (<15).The APTT was slightly prolonged to 40.5 s.X-ray of the chest revealed enlarged heart, pulmonary congestion, pleural adhesions and small amount of fluid in the left pleural cavity with absence of radiographic signs of pneumonia. Echocardiography exposed generalized hypokinesis of the left ventricular myocardium (EF 55%) and a slight amount of fluid in pericardium. Heart valves were without vegetations. Performed thoracic angio-CT excluded the suspicion of pulmonary embolism. The CT of head and neck exposed enlarged cervical lymph nodes. The abdominal ultrasound did not reveal abnormalities. The treatment with antibiotics was continued, the patient received antipyretic, analgesics, i.v.hydration. During hospitalization, the patient was reporting muscle ache (without elevation of creatinine kinase), diarrhea and on the third day after admission she presented an episode of somatoform delirium. After the consultation of infectious diseases specialist, the diagnostics was upgraded to include cytomegaly, mononucleosis, toxoplasmosis, syphilis, HIV infection, tuberculosis, active borreliosis- none was positive. The test for *Streptococcus pneumoniae* excluded the infection. The throat swab revealed numerous colonies of *Candida albicans*. The tests for systemic connective tissue diseases and monoclonal gammapathy were also negative. After exclusion of the infectious disease and autoimmune disease suspected from the beginning MIS-A was confirmed and dexamethasone treatment was started – initially with iv. therapy (8 mg per day). On the third day after clinical improvement – incl. cervical lymph node size reduction, body temperature normalization, the oral treatment with dexamethasone (4 mg per day) was continued. Further hospitalization resulted in a clear improvement of the patient's general condition and a systematic decrease in inflammatory parameters. After 12 days, the patient was discharged home.

Discussion

MIS-A is thought to be underdiagnosed as it is reported in much lower frequency than MIS-C.[2] The pathophysiology of this condition is also poorly understood for the time being and the diagnostics process is relatively long and troublesome as it involves the exclusion of alternate diseases. First worldwide reports of this illness date back to autumn 2020 which makes the entity relatively new. We currently have scientific reports concerning post SARS-CoV2 vaccine multisystem inflammatory syndrome known as MIS-V.[4-6] Moreover, non-specific clinical picture can be the cause of prolonged diagnosis.

In the presented case:

- high fever (up to 40°C) 3 days before hospitalization
- rash and conjunctivitis
- cardiac illness- myocarditis, pericarditis and impaired function of right ventricle
- hypotension
- abdominal pain
- diarrhea
- elevated level of the CRP, ferritin, IL-6, procalcitonin, NT pro BNP, troponin

The patient was within the age range for MIS-A with prior SARS- CoV2 infection. This case fulfilled the Brighton Collaboration Case Definition for MIS-A.[1,3]

Conclusion

Settling the recognition of MIS-A can be challenging because health professionals are only beginning to gain experience with this unit. Its effective treatment requires the use of steroids. MIS-A is a rare disease. The diagnostic procedure must exclude other diseases in which an excessive immune response is activated. A history of preceding SARS-CoV-2 infection is important. The BCCD guidelines are helpful in establishing the diagnosis. However, medical management requires performing a full differential diagnosis and introducing adequate treatment. In the presented case, the diagnostic procedure, taking into account MIS-A, made it possible to establish the correct diagnosis. Treatment with steroids, in a short period of time, led to the patient's recovery.

Declarations

Funding

This research did not receive any specific grant from funding agencies.

Author contributions

Conceptualization, H.D. and B.D.; Methodology B.D.; Validation, H.D. and B.D; Formal Analysis, H.D.; Investigation, H.D. and B.D; Resources, H.D. and B.D.; Data Curation, H.D.; Writing – Original Draft Preparation, H.D.; Writing – Review & Editing, H.D. and B.D.; Visualization, H.D.; Supervision, H.D.; Project Administration, H.D.

Conflicts of interest

The authors have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

Data availability

The data have not been made public, but are kept with the authors, if necessary.

Ethics approval

Written informed consent for publication was obtained from the patient. We complied with the policy of the journal on ethical consent.

References

1. Vogel T, Top K, Karatzios C, et al. Multisystem inflammatory syndrome in children and adults (MIS-C/A): Case definition & guidelines for data collection, analysis, and presentation of immunization safety data. *Vaccine*. 2021:39(22):3037-3049. doi: 10.1016/j.vaccine.2021.01.054.
2. Amato M, Hennessy C, Shah K, Mayer J. Multisystem Inflammatory Syndrome in an Adult. *J Emerg Med*. 2021;61(1):e1-e3.
3. Nune A, IyengarK , Goddard C, Ahmed A. Multisystem inflammatory syndrome in an adult following the SARS-CoV-2 vaccine (MIS-V). *BMJ Case Rep*. 2021;14(7):e243888. doi: 10.1136/bcr-2021-243888.
4. Cattaneo P, Volpe A, Cardellino C, et al. Multisystem Inflammatory Syndrome in an Adult (MIS-A)Successfully Treated with Anakinra and Glucocorticoids. *Microorganisms*. 2021;9(7):1393.doi: 10.3390/microorganisms9071393.
5. Salzman M, Huang C, O'Brien C, Castillo R. Multisystem Inflammatory Syndrome after SARS-CoV-2 Infection and COVID-19 Vaccination. *Emerg Infect Dis*. 2021;27(7):1944-1948. doi: 10.3201/eid2707.210594.
6. Uwaydah A, Hassan N, Abu Ghoush M, Shahin K. Adult multisystem inflammatory syndrome in a patient who recovered from COVID-19 postvaccination. *BMJ Case Rep*. 2021;14(4):e242060. doi: 10.1136/bcr-2021-242060.