

## Post vaccination -Multisystemic Inflammatory Syndrome -Adults

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Received: 09 Aug 2021

Accepted: 23 Aug 2021

Published: 28 Aug 2021

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### Citation:

Khosla P, Post vaccination -Multisystemic Inflammatory Syndrome -Adults. *Ann Clin Med Case Rep.* 2021; V7(5): 1-2

### Keywords:

Multisystem Inflammatory Syndrome in Children and Adults (MIS-C/A); Covid vaccine; Fever

## 1. Abstract

**1.1. Introduction:** Multi-system inflammatory syndrome in adults (MIS-A) is gaining recognition among adult physicians. MIS-A is a rare but important syndrome that can be difficult to distinguish from severe COVID-19. MIS- A can occur following vaccination for SARS-CoV-2 is not reported till date.

**1.2. Case report:** The 27 year old health care worker presented with high-grade fever, nausea, vomiting and abdominal pain within four weeks of vaccination for Covid-19. He had a toxic look, cervical lymphadenopathy, hepato-splenomegaly, and left-sided pleural effusion.

On investigation His inflammatory and coagulation markers, including C-reactive protein, Interleukin -6, ferritin and D-dimer, were markedly elevated. The patient was managed with injectable methylprednisolone and low-molecular-weight heparin and he improved clinically.

This study introduces a case of Multisystem Inflammatory Syndrome in adults (MIS-A), where the patient presented 4 weeks after initial COVID-19 vaccination. His clinical course was consistent with the working definition of MIS-A as specified by the CDC.

**1.3. Conclusions:** This case emphasizes multisystem inflammatory syndrome in children and adults (MIS-C/A)" to be considered for the evaluation of adverse events following immunization.

## 2. Introduction

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and has rapidly spread worldwide. As of June, there were over 17.8Cr confirmed cases globally and 38,60,481 deaths [1]. Various vaccines have

been developed after rigorous study of viral replication, infectivity, and host immune response. Epidemiological evidence suggests that the virus will continue to spread with ease and the global infection rate will continue to grow until one of the two breakthroughs occur [2]. Either there is a vaccine that is safe, effective, widely available, and used by the population; or 2) immunity is achieved whereby the virus has infected a significant proportion of the population. Although vaccines seem to be the most logical and promising approach for controlling the pandemic, they are associated with some risk and side effects. All types of vaccines have the potential to increase the risk to those who receive them.

## 3. Case History

The 27 year old health care worker was apparently well four weeks back, when he developed high-grade fever after covid vaccination, which lasted for 3 days. This was associated with weakness, malaise, and lethargy. He improved after three days and resumed his regular work. He started running high-grade fever again within one week, which was associated with chills, with a maximum temperature of 103.6 °Fahrenheit(F). He had a history of abdominal pain, nausea, and vomiting for 4 days prior to admission. The patient had a toxic look, febrile and bilateral cervical lymphadenopathy. Pulse 122/minute blood pressure 110 /70 mmHg, temperature 103degree F. Abdominal examination revealed hepatosplenomegaly. On investigation, the total leukocyte count was 18720 /cubic millimetre with 77% neutrophilia, 10 % lymphocytes, 13 % monocytes, C reactive protein -158 mg per litre, IL- 6- 168 picogram per ml, ferritin 1050 ng/ml, d-dimer 0.79, and serum procalcitonin levels were normal. Ultrasonography confirmed hepatosplenomegaly with left pleural effusion. His 2D echocardiogram was normal. The

patient did not have a prior history of covid-19 infection or positive antibodies for anti-SARS-COV. Dual SARS-CoV-2 RT-PCR and antibody testing, and a thorough history focusing on whether the patient had preceding epidemiologic links to COVID-19 cases or previous (sometimes subtle) symptoms of COVID-19 can provide supportive evidence for suspected multisystem inflammatory syndrome (MIS-A). Findings of a negative RT-PCR test result and positive antibody test result in the setting of a suggestive clinical history and presentation may be helpful. His covid total antibody result was 500 (>1 positive for Anti-SARS-COV-2)

The patient was administered injectable methylprednisolone 40 mg twice a day for 4 days and a low molecular weight heparin, and the patient improved clinically and was discharged on oral steroids tapered off over 6 weeks. Our patient had multi-system inflammatory syndrome post-covid vaccination.

#### 4. Discussion

Vaccination provides durable or lasting immunity to the virus; however, the duration of effective immunity remains uncertain. Vaccines are a critical new tool in the battle against COVID-19, and it is very encouraging to see so many vaccines are successful and going into development [2]. Various vaccines have been given emergency approval, while the third phase of the trial is still underway [3].

Elicits a robust immune response to a single viral protein the spike protein. It works in the body by creating antibodies, which help fight the virus the question is whether some of these post-infectious inflammatory syndromes (multisystemic inflammatory syndrome in children/adults MIS-C/A) are actually from the antibodies themselves or they are from direct inflammation from the virus.” The inflammatory risk makes vaccine development particularly challenging in the paediatric population. If the vaccine is able to induce a type of antibody response, which can result in a post-viral syndrome, which is rare, but is very serious and now termed” multi-system inflammatory syndrome in children’ (MIS-C). The presentation is generally fever, elevated inflammatory markers, and rash or mucous membrane changes, with or without myocardial dysfunction and shock. This is not caused by another pathogen and with a known response to or positivity for SARS-COV-2 in the recent past. If MIS is postinfectious or antibody-mediated, it could have important implications for vaccine safety. Even multi-system inflammatory syndrome in adults (MIS-A) is gaining recognition among providers caring for adults. MIS-A is a rare but important syndrome that can be difficult to distinguish from severe COVID-19, particularly in older patients with multiple comorbidities [4, 5].

Vaccines for SARS-CoV-2 are under active development, and it is not yet known whether MIS-C/A can or will occur following vaccination for SARS-CoV-2. To date, no reports have been made of MIS-C/A following SARS-CoV-2 vaccination to date [5].

Our patient fulfilled most of the clinical and laboratory criteria of MIS-A, as per the case definition by Vogel et al. His symptoms triggered post-vaccination and settled with immunomodulation with steroids.

Three potential post-vaccination scenarios must be considered. First, patients not exposed to SARS-CoV-2 infection may be vaccinated against SARS-CoV-2 and then develop an illness for which they are evaluated for MIS-C/A. Second, patients who have had COVID-19 may subsequently be vaccinated against SARS-CoV-2 and then develop an illness for which they are evaluated for MIS-C/A, which was recently been reported by Uwaydah AK [6]. Finally, patients who have already been vaccinated with SARS-CoV-2 (whether or not they previously had COVID-19) may then become infected or reinfected with SARS-CoV-2 and then develop an illness for which they are evaluated for MIS-C/A [5].

#### 5. Conclusions

It seems reasonable to predict that vaccine-related MIS-C/A, if it exists, would follow a timeline similar to MIS-C/A after natural infection, that is, presenting within 4-6 weeks after vaccination for MIS-C and up to 12 weeks after vaccination in MIS-A. Awareness of this condition, post-covid vaccination, mainly helps us in timely handling of the potentially serious and rare complications of vaccination.

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