

Introduction :

In December 2020, the U.S. Food and Drug Administration approved the first mRNA COVID-19 under Emergency Use Authorization (EUA) after pharmaceutical companies found in a phase 3 study that the messenger RNA vaccines were 95% effective.

Other advantages of mRNA vaccine over traditional vaccines are reducing the risk of infection, severe illness, hospitalization, and death. (1) Other advantages include being non-infectious, no DNA integration, and the wide availability to the public. (2)

In May 2022 the number of COVID-19 mRNA vaccinations administered was 561 million in the USA. (Figure 1)

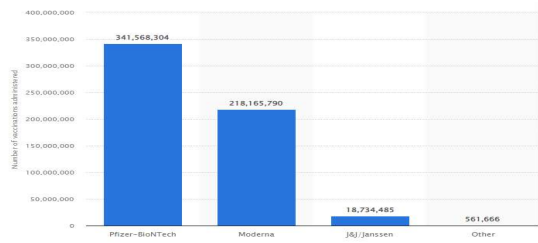


Figure 1: Breakdown of COVID-19 vaccinations administered as of May 2022. ≈561 million COVID-19 mRNA vaccinations (Pfizer-BioNTech [BNT162b2] + Moderna [mRNA-1273]) were administered.

When the uptake of the COVID-19 vaccine increased in the general population, side effects from the vaccine began to emerge. Rare cases of pericarditis have been reported, mainly in young adult males, with the majority of symptoms presenting after second dose administration. (3)

We report the case of a **24-year-old female** in previous good health who **developed pericarditis 3-weeks following first dose** of the BNT162b2 mRNA COVID-19 vaccine.

Case Description:

A 24-year-old female with no significant history presented with one day of mid-chest pain, 5/10 intensity, radiating to the left arm, exacerbated with deep inspiration and lying flat, and improved with leaning forward. The patient had received first dose of BNT162b2 mRNA COVID-19 vaccine 3-weeks prior to symptoms onset. There was no family history of cardiac disease. On arrival, vital signs were normal except for a heart rate of 109 beats/min.

On physical examination, the patient was overweight and appeared anxious.

Electrocardiogram (ECG) showed normal sinus rhythm with T wave inversion in leads V1, V2, and V3 (Figure 2).

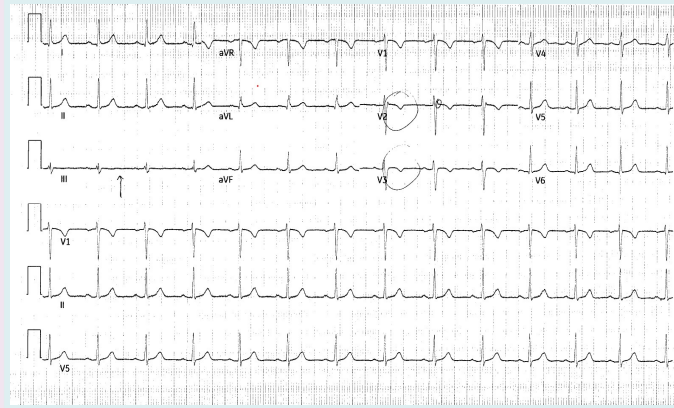


Figure 2: Electrocardiogram showing normal sinus rhythm with T wave inversion in leads V1, V2, and V3.

The chest X-ray revealed a normal cardiac silhouette. The blood work was unrevealing; baseline and repeated troponins were unremarkable. **The erythrocyte sedimentation rate was normal and C-reactive protein (CRP) without significant elevation at 1.4 units.**

A CT angiogram of the chest did not demonstrate a pulmonary embolism

A repeated ECG and telemetry strips showed normal sinus rhythm, ST elevation with T wave inversions and PR depression in multiple leads (Figure 3)

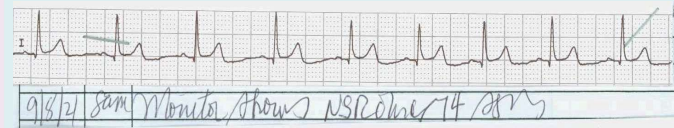


Figure 3: Telemetry strips showed normal sinus rhythm, ST elevation with T wave inversions and PR depression.

Echocardiographic findings were normal left ventricular ejection fraction, no pericardial effusion or other abnormal findings. ECG findings and clinical presentation were consistent with pericarditis.

The patient was discharged with ibuprofen and colchicine 2 days after admission, and showed improvement without residual symptoms 2 weeks later.

Discussion:

Pericarditis secondary to COVID-19 infection is not uncommon and has probably been underreported. Confirmed pericarditis with complications such as pericardial effusion has been incidentally identified in 6% of critically ill COVID-19 patients who underwent chest CT.(6)

On the other hand, pericarditis related to the COVID-19 mRNA vaccine, which has been under the spot light, is extremely rare.

Classically, regardless of the etiology, 90% of cases present with distinct ECG changes of pericarditis.

In the initial presentation, CRP can be elevated in 78% of pericarditis patients, **only 3.5% of pericarditis patients have no CRP elevation** throughout all phases of the course. (5,8)

In patients with COVID-19 infection, when there is cardiac involvement, it is often clinically significant. The patient may suffer long-term sequelae of pericarditis such as arrhythmias, pericardial effusion, and death.

Reported cases of pericarditis related to the COVID-19 mRNA vaccine have typically been mild in nature with rapid resolution and without long-term complications.

However, **clinicians should be vigilant about this rare side effect of COVID-19 vaccination, which may present without characteristic lab findings.** Such patients should be carefully evaluated and **require appropriate workup and management.** (7)

Patients should be advised that pericarditis related to COVID-19 vaccine is rare and mild in course. Knowing that the benefit of COVID-19 vaccination outweighs the risk.

References:

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