

Recurrent Severe Acute Immune Thrombocytopenia Secondary to the Pfizer-BioNTech COVID-19 Vaccine: a Case Report

James Dreer, DO¹, Rahul Bussa, MD¹, Charyguly Annageldiyev, MD¹, Elizabeth Federici, MD^{1,2,3}

¹Department of Medicine; ²Division of Hematology and Oncology; ³Penn State Cancer Institute
Penn State Milton S. Hershey Medical Center, Hershey PA

Introduction

- ❖ Immune Thrombocytopenic Purpura (ITP) is an autoimmune condition in which platelets are destroyed by the production of IgG against platelet antigens such as GPIIb/IIIa. ^{1,2}
- ❖ Antibody-bound platelets are consumed by splenic macrophages
- ❖ ITP is a rare complication of acute viral illness and vaccinations³.
- ❖ Secondary ITP occurs with administration of some vaccines:
 - Influenza
 - MMR
 - Diphtheria-Tetanus-Pertussis
 - Varicella
 - Hepatitis A
- ❖ Recently, SARS-CoV2 infection and vaccination are shown to be associated with secondary ITP.²
- ❖ To date, Pfizer-BioNTech, Moderna, AstraZeneca, and Johnson & Johnson have all been associated with vaccine-induced ITP. ^{2,3,4,5}

Case Description

HISTORY OF PRESENT ILLNESS

31-year-old male presented with a 1-day history of tongue bruising, purpura on the upper and lower extremities, bleeding gums, and blood-tinged urine. Platelet count 1,000/uL on CBC at presentation.

- ❖ Received 1st dose of the Pfizer-BioNTech COVID-19 vaccine 3 weeks prior and the 2nd dose one day prior to presentation.

PAST MEDICAL HISTORY

Acute ITP diagnosed 2 years prior in remission until this presentation. ANA was positive at that time.

- ❖ Previous incidence of ITP refractory to steroid and IVIG therapy and required TPO-agonist. Discontinued after normalization of platelet count.
- ❖ New diagnosis of latent autoimmune diabetes in adults (GAD+)

PHYSICAL EXAM

- ❖ Purpura on the tongue and both petechiae and purpura on bilateral extremities.

RADIOLOGY

- ❖ Abdominal ultrasound revealed a normal appearing spleen

Case Description (cont.)

DIAGNOSIS

Recurrent severe acute ITP secondary to COVID-19 vaccination

- ❖ Platelet antibodies: anti-GPIa/IIa antibody; HLA Class I antibody
- ❖ ANA +anti-SSA antibody positive.
- ❖ Other causes of secondary ITP including HCV, HIV and chronic H. pylori infection were ruled out.

TREATMENT

Initially, treated with dexamethasone without response. On day 2, IV immune globulin was added over four days.

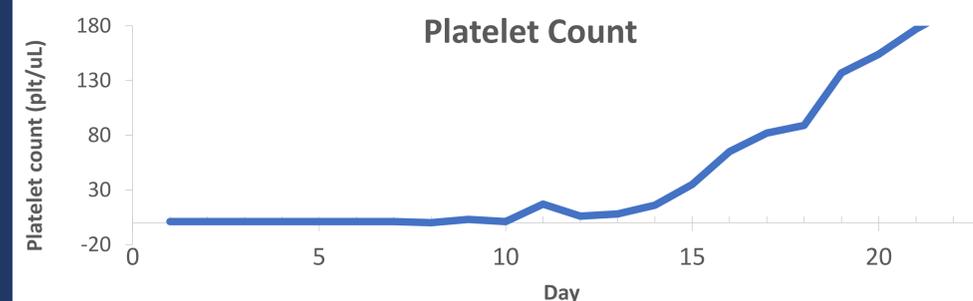
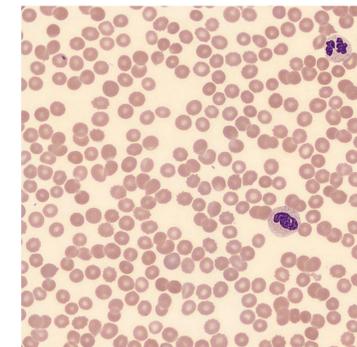
- ❖ He was given 375 mg/m² Rituximab on day 4.
- ❖ On day 7, platelet count remained low. Initiated daily 50mg Eltrombopag, a thrombopoietin receptor agonist.
- ❖ Platelet counts recovered to 177,000/uL. Eltrombopag reduced to 50mg every other day with continued remission.

Discussion

- ❖ COVID-19 vaccine safety profile is excellent.⁴ 398 million doses of the COVID vaccines administered in the US. ⁶ Only 580 events involving thrombocytopenia related to all COVID-19 vaccines per the Vaccine Adverse Event Reporting System (VAERS).
- ❖ ITP cause is difficult to ascertain in patients with an established diagnosis of ITP. Symptoms, including purpura and bruising, generally occur after 24 hours and rarely within hours. ⁷
- ❖ Treatment of vaccine-related ITP is similar to primary ITP:⁸
 - Initiate treatment with steroid therapy, commonly dexamethasone. IVIG is added for refractory cases and when rapid correction of thrombocytopenia is needed
 - Refractory ITP can be treated with TPO-agonists. Immunotherapy, such as Rituximab, is generally not required in the acute setting.
- ❖ Mechanism of secondary ITP due to vaccination is not well understood. ^{2,5,7}
 - Molecular mimicry and autoantibody generation are leading hypotheses.
 - ITP similarities due to COVID-19 vaccination and infection raise an interesting question of a potentially related process.

Laboratory

| Lab | Results |
|-------------------|--------------------------|
| Platelet Count | 1,000/uL |
| Hemoglobin | 13.6 g/dL |
| PT / INR | 13.7 s / 1.1 |
| PTT | 25 s |
| Fibrinogen | 387 mg/dL |
| Haptoglobin | 103 mg/dL |
| ANA | Positive, 1:320 speckled |
| Anti-SSA antibody | 28.3 u/mL |
| HCV | Negative |
| H. Pylori | Negative |
| HIV | Negative |



Conclusions

- ❖ COVID-19 vaccinations have an excellent safety profile. Adverse events attributed to the COVID-19 vaccinations are on par with other vaccinations.
- ❖ Secondary ITP is a rare but known side effect of vaccines
- ❖ ITP history should not preclude patients from obtaining the vaccine. High clinical suspicion of ITP should be maintained if clinically relevant.
- ❖ The rapid onset of thrombocytopenia could suggest his previous the previous immunization may have sensitized our patient's immune system

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