Northeast Georgia Medical Center
GRADUATE MEDICAL EDUCATION

BNT162b2 COVID-19 Vaccine Induced Immune Thrombocytopenic Purpura

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Background

- Immune thrombocytopenic purpura (ITP) is a condition where the platelet count is less than 100,000/μL and is associated with petechiae, bruising, or mucosal bleeding when the platelet count is below 50,000/μL.
- ITP may be primary when autoantibodies to platelets cause platelet destruction; or secondary to an associated condition such as medications, infections, malignancies or autoimmune conditions.
- Prior reports have indicated that vaccinations such as MMR have resulted in ITP in children, and that viral infections such as Hepatitis C, HIV and EBV infection can be associated with ITP.
- We present a patient with severe ITP after receiving the second dose of the BNT162b2 mRNA COVID-19 vaccine (Pfizer BioNTech).

Case Vignette

A 63-year-old female presented with rash and bruising, starting one day after receiving her second COVID vaccination. The rash started on her legs, subsequently spreading to most of her body. The next day, she noticed bruising on her lower back and her tongue, both without inciting trauma nor any active bleeding, prompting her presentation to the hospital. She denied history of liver disease or bleeding tendencies, nor was she taking any home medications that could explain her symptoms.

Physical examination revealed generalized petechiae and subcutaneous bruise on the lower back. Laboratory evaluation showed a platelet count of 0/uL. Peripheral blood smear showed decreased platelets without immature platelets, and no schistocytes. Normocytic anemia and normal white blood cell count were observed. CT angiogram pulmonary was negative for pulmonary embolism, and CT head showed no intracranial bleeding. Subsequent workup found normal LDH, haptoglobin, and bilirubin levels, ruling out MAHA.

Based on these findings, the patient was diagnosed with immune thrombocytopenic purpura (ITP), suspected secondary to the COVID vaccine. She was admitted to the hospital and started on dexamethasone at 40 mg orally daily for 5 days, as well as IVIG 1 g/kg once daily for 2 days.

While her bruising gradually improved without evidence of new bleeding, her platelet counts remained slow to improve. Because her thrombocytopenia was refractory to IVIG and initial steroids, she was given prednisone 50 mg daily for 9 days, as well as two doses of Nplate and one dose of Rituxan. Her platelet counts gradually improved, reaching 99,000/μL on day of discharge. She was arranged to receive a Prednisone taper as well as her remaining three doses of rituxan in the outpatient setting.

Discussion

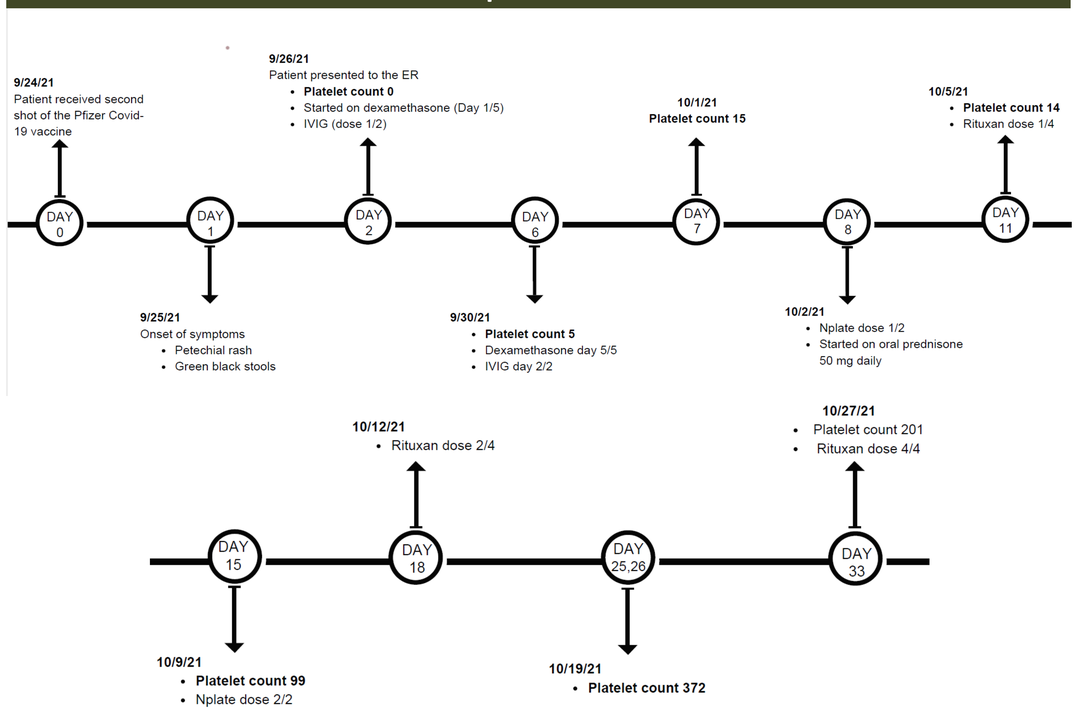
- The diagnosis of ITP is made after exclusion of other causes of thrombocytopenia as well as response to treatment.
- The temporal association of symptom onset after the BNT162b2 vaccine is significant, as was seen in our patient. A detailed review of current literature found cases of other patients diagnosed with ITP after COVID vaccination.
- However, most reports observed ITP after the first vaccine dose, while it was rare to find reports of ITP occurring after the second dose.
- In summary, we report a rare case of severe ITP likely induced by the Pfizer COVID vaccine, while demonstrating that this condition responds well to therapy when diagnosed early.

Labs on Admission

Table 1: Laboratory values on admission.

Test (reference ranges)	Lab value on admission
Complete blood cell count	
Hemoglobin (12.1–15.1 g/dL)	12.7 g/dL
Hematocrit (36.1–44.3%)	37.9%
Platelet counts ($150–450 \times 10^3/\mu l$)	$0 \times 10^3/\mu l$
White blood cells ($4.5–10.0 \times 10^3/\mu l$)	$6.8 \times 10^3/\mu L$
Red blood cells ($4.2–5.4 \times 10^9/\mu l$)	$3.01 \times 10^9/\mu l$
Coagulation	
Test (references ranges)	Lab value on admission
Prothrombin time (11–14 seconds)	11.9 seconds
PTT (20–40 seconds)	25.4 seconds
INR (0.9–1.2)	1.04
Comprehensive metabolic profile	
Test (references ranges)	Lab value on admission
AST (5–30 IU/L)	33 IU/L
ALT (5–30 IU/L)	44 IU/L
Total bilirubin (0.3–1.9 mg/dL)	0.5 mg/dL
ALP (44–147 IU/L)	39 IU/L
BUN (6–20 mg/dL)	33 mg/dL
Creatinine (0.6–1.2 mg/dL)	1.04 mg/dL
Total protein (6.0–8.3 g/dL)	8.3 g/dL
Albumin (3.5–5.4 g/dL)	2.7 g/dL
Vitamin B12 (130–700 pg/mL)	1469 pg/mL
Folate (2–20 ng/mL)	18.1 ng/ML
Iron (30–170 μg/dL)	75 μg/dL
LDH (50–150 IU/L)	131 IU/L
Haptoglobin (41–165 mg/dL)	177.0 mg/dL
D-dimer (<0.5 μg/mL)	0.850 μg/mL

Hospital Course



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