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An Unusual Case of Severe Vaccine Induced Immunologic Thrombocytopenia Purpura fromModerna SARS-CoV-2 Vaccination in an Immunocompromised Patient

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ABSTRACT

Introduction: Immune Thrombocytopenia (ITP) is an autoimmune hematologic disorder characterized by destruction of platelets and decreased platelet production due to antibodies directed against platelet surface glycoproteins. ITP can be both primary with unknown etiology and secondary, presenting after viral illness, with concurrent autoimmune disease, or post vaccination. Severe secondary immune thrombocytopenia has been recorded after administration of both Pfizer andModerna SARS-CoV-2 vaccination. Our goal is to alert clinicians to the relationship of de novopost-vaccination ITP after administration of the SARS-CoV-2 vaccines, specifically in immunosuppressed populations.

Keywords: SARS-CoV-2; Vaccine; Immune Thrombocytopenia (ITP)

CASE DESCRIPTION

A 20 year old female with history of FSGS s/p kidney transplant in 2019 initially presented to anurgent care in June 2021 with petechiae on arms and legs. The patient had received a second dose of Moderna SARS-CoV-2 vaccine 3 weeks prior. She had been on mycophenolate and tacrolimus intermittently since transplant. Upon admission, a complete blood test revealed platelets to be 0. Repeat CBC showed < 2 x 10^9 platelets, while other initial labs were

unremarkable. Iron studies showed iron deficiency anemia and the patient were started on iron supplementation. On physical examination, the patient was afebrile, hemodynamically stable, anicteric, and showed no signs of active bleeding. She had petechiae on bilateral arms and legs. She was initially transfused with platelets, and immediately received IVIG with a four day course of dexamethasone. Upon discharge, platelet counts had risen to 78 x 10^9. Nine days after discharge the patient developed hemorrhagic bullae of the tongue and oral mucosa as well as petechiae; platelets were found to be 4 x 10^9 with LDH elevated. Fibrinogen levels were low but again there were no clinical signs of bleeding. Platelets remained < 100 and patient was started on Nplate and prednisone with plan to taper over 68 weeks. The patient was monitored closely as an outpatient; as thrombocytopenia failed to respond to six weeks of treatment with Nplate and prednisone, the decision was made to start Rituxin. During this four cycle treatment, the patient was admitted to the hospital three times due to worsening thrombocytopenia, significant menorrhagia, hemorrhagic bullae of oral mucosa, worsening petechiae, and ecchymoses of unknown etiology.[1-4]

DISCUSSION

ITP is most commonly idiopathic in origin but also may be due to secondary causes, one such being vaccines. The pathogenesis of vaccine induced ITP (VITP) is hypothesized to originate from different etiologies such as molecular mimicry, epitope spreading, and polyclonal activation. This presents with a flu-like prodrome leading to laboratory and physical exam findings of bleeding and coagulation abnormalities. VITP has historically been most associated with the MMR vaccine and the Varicella-Zoster, but there are reports of others, including the SARS-CoV-2 vaccine. Analysis of identified cases in the vaccine adverse event reporting system revealed 77 cases of de-novo ITP cases following a SARS-CoV-2 vaccine. Of the 28 patients that reported full data, 26 patients responded well with IVIG and steroid treatment. Additionally, the CDC published a study that showed fewer adverse side effects with vaccine boosters in immunocompromised patients. Many cases reported mention a transient case of ITP with swift resolution or prior chronic ITP that flared. In our patient's case, multiple therapies were unable to keep her stable outpatient. She required multiple admissions with an unrelenting course, with complications of sepsis, renal failure, and neutropenic fever. Currently, she is undergoing further treatments with Nplate and Dexamethasone for 1.5 years post diagnosis aftersuboptimal responses to Rituximab. All SARS-CoV-2 vaccines are still recommended by the CDC. Although questionable efficacy with prevention of disease, the boosters were all recommended for those of elderly age and of immunocompromised state. Although current guidelines shall be applied as general standard of care, there are potential adverse effects in special populations. Further data to accumulate adequate side effect profile will help appropriatevaccine administration.[5-8]

CONCLUSION

Although extremely rare, the timing of this patient's presentation of ITP is consistent with Moderna SARS-CoV-2 vaccine induced immune thrombotic thrombocytopenia. ITP has been reported following COVID-19 vaccination with mRNA COVID vaccines; however, prolonged refractory ITP post mRNA COVID vaccine has yet to be

explored. Our report illustrates that vaccine induced immune thrombotic thrombocytopenia has the potential to be a long-term challenge for patients in the setting of preexisting immunodeficiency despite following the current consensus of ITP treatment with corticosteroids, IVIG, and platelet transfusion.

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