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Immune Thrombocytopenia in AstraZeneca SARS-CoV- 2 Vaccinated Patients- Case Report And Review of Literature

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ABSTRACT

In the era of COVID-19 pandemic, World is rushing towards immunizations against the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Recent literature has documented many case reports of different entities of thrombocytopenia after different SARS-CoV-2 vaccines. There are different underlying pathogenesis has supposed. We have observed thrombocytopenia with characteristic giant platelets on a peripheral smear in patients who recently got AZ COVID vaccine (AZD1222) in a short period. We did an extensive literature review for thrombocytopenia after all kind of the vaccination and this observation is not reported in recipients of AZ COVID vaccine. It highlights the diagnostic challenge, a clinical presentation, and the treatment strategy in such rare cases.

Keywords: Thrombocytopenia, Giant platelets, AstraZeneca vaccine

INTRODUCTION

There has been an increased risk of ITP (immune Thrombocytopenic Purpura) after administration of various vaccines like influenza, measles-mumps-rubella etc. [1, 2, 3, 4, 5, 6, 7, 8, 9, 10] But, the SARS-CoV-2 vaccine appears to rarely cause an immune-mediated platelet destruction, not unlike that seen with other vaccines. [2, 4, 6] Millions of people are being vaccinated with the new SARS-CoV-2 vaccines. FDA vaccine adverse event reporting system (VAERS) documented a small but growing number of cases of thrombocytopenia (platelets <150x10^9/L) after SARS-CoV-2 vaccination. [11] The pathogenesis of SARS-CoV-2 vaccine-related thrombocytopenia is not completely understood. The incidence of secondary ITP following vaccines provides inconsistent possible mechanisms that vaccines contain some anti-sense oligonucleotides that trigger an immune response, [12, 13] some individuals may

have preformed antibodies directed against polyethylene-glycol or to other components of the outer lipid layer of the nanoparticles. Other possibility may be that had mild pre-existing ITP. [14, 15]

Case 1

A 33 year-old male recently diagnosed diabetes mellitus presented to an emergency room complaining of body ache and generalized fatigability for 3 days. No history of fever or skin bruises or a bleeding from any site. No history suggestive of local thrombosis. He has received his first dose of AstraZeneca SARS-CoV2 vaccine 17 days before the presentation. One year back his platelets were 225 x 10^9/L. On the 17th post vaccination day (April 21, 2021) he was admitted with low platelets (43x 10^9/L) count and body aches. He was vitally stable and Systemic examination was normal. Evaluation was done regarding thrombocytopenia and viral serology (COVID-19 PCR, human immunodeficiency virus, Hepatitis B virus, Hepatitis C virus, Epstein-Barr virus, cytomegalovirus), autoimmune work up (rheumatoid factor, ANA), HIT antibodies, Helicobacter Ab, vitamin B12 level, dengue serology, and brucellosis serology results were unremarkable. Peripheral blood smear (image1) showed marked thrombocytopenia with some giant platelets. Complete parameters of blood count at time of admission were; Hemoglobin. 14.7 gm/dl, Wbcs. 4.1 x10^9/L, platelets counts 43 x10^9/L, mean platelet volume (MPV) 13.6 fl with platelet distribution width (PDW) 21.7 fl. Patient was managed with supportive care for five days. Platelets were improved to 104 x10^9/L on day of discharge (5th day) without adverse event during hospital stay. Platelets count observed 157 x10^9/L on 1 week follow up.

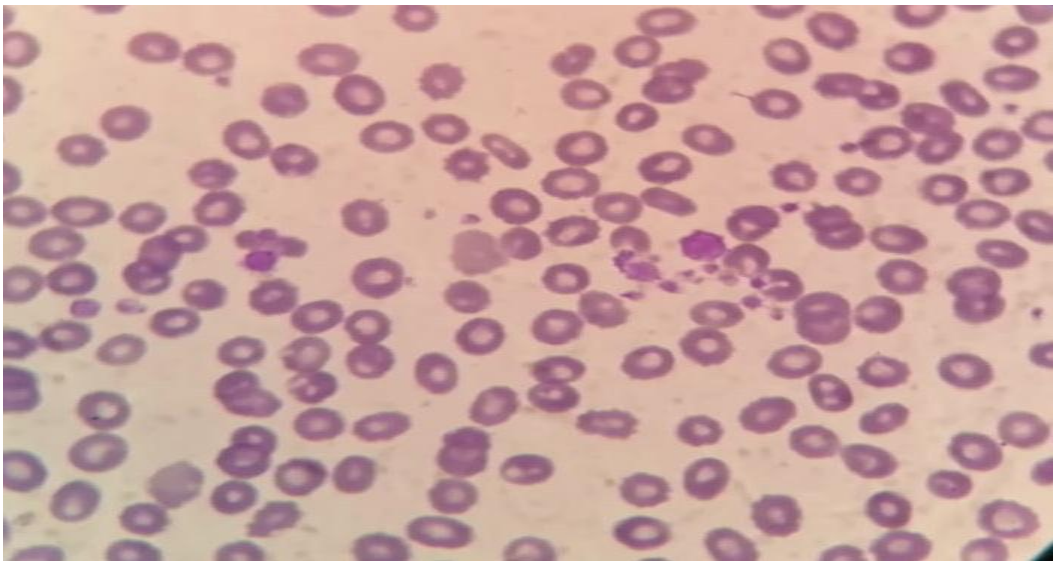

Image 1: Case 1 blood smear with giant platelet (black arrow)**.**

Case 2

The patient is a 39-year-old healthy male without any co-morbidity, who presented to the emergency room with generalized weakness, headache and localized rash on upper limbs. All symptoms started two days after receiving the first dose of AstraZeneca SARS-CoV- 2 vaccine. He did not take any medication except paracetamol for fatigue. On 27th post vaccine day (April 23, 2021), he came to emergency room with all above symptoms refractory to oral paracetamol. No history of fever. On reviewing further history, he described the rash as a non-itchy, non-painful rash. He denied any bleeding from any site. He was vitally stable and afebrile. Systemic review was unremarkable except multiple bruises of about 5x5 cm on both arms. Case was evaluated for thrombocytopenia. Viral serology, autoimmune work up, HIT antibodies, Helicobacter Ab, vitamin B12 level, dengue serology, and brucellosis serology results were negative. Complete Blood count showed marked thrombocytopenia (14 x10^9/L) with normal Hemoglobin (14.7 gm/dl), and Wbcs (4.1 x10^9/L). MPV was 14.5 fl along with PDW 21.7 fl. Peripheral smear (image 2) showed giant platelets with significant thrombocytopenia. Patient was managed

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with supportive care along with 2 doses of 1gm/kg/day of immunoglobulin. No new event documented during hospital stay and his bruises disappeared. Patient was subjectively feeling better. His platelets count improved to 41 x10^9/L on the day of discharge (6th day). Follow up platelets were observed 157 x10^9/L after one week and patient remained asymptomatic without any medication.

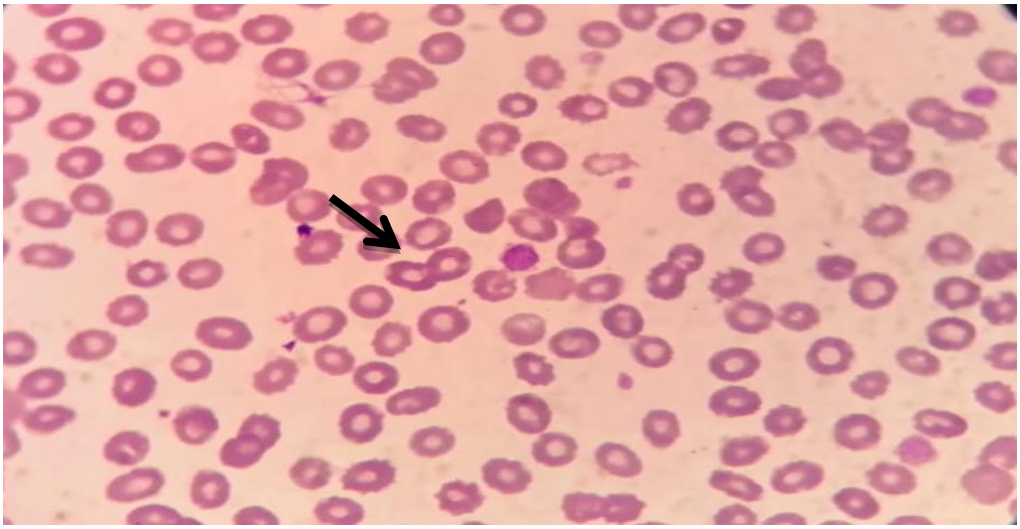

Image 2: Case 2 peripheral smear with giant platelet (black arrow).

Discussion:

ITP (Immune Thrombocytopenic Purpura) is an autoimmune disorder characterized by increased platelet destruction and decreased platelet production and incidence of ITP is documented 6 per 100,000 adults/year. [16]

Daily reported cases of secondary immune thrombocytopenia after SARS-CoV-2 vaccination are increasing in number. We observed 2 cases of very low platelet counts 1-3 weeks after first dose of AstraZeneca vaccine. In order to enhance our understanding of the possible relationship with AstraZeneca vaccine, we failed to find any reported case of secondary thrombocytopenia with AstraZeneca vaccine. In literature review we found many cases of thrombocytopenia after Pfizer and Moderna SARS-Cov-2 vaccine.

Recently Centers for Disease Control and Prevention (CDC) reported 17 cases following vaccination without preexisting thrombocytopenia. Age range was 22–73 years old and most patients presented with petechiae, bruising or mucosal bleeding with onset of symptoms between 1–23 days post vaccination. Platelet counts at presentation in majority were at or below 10 $\times 10^9$/L. 15 cases of suspected ITP were managed on line of ITP with combination therapy and improvement seen in 14 patients. [17]

Vaccine adverse event reporting system (VAERS) highlight that fourteen cases developed bruises without documentation of thrombocytopenia and five cases had thrombocytopenia in month of January and February 2021. [11] These five cases were managed as ITP and improved. All these VAERS reported cases received Moderna or Pfizer vaccine. Another case reported in the first week of March, a 60 years old male with multiple co-morbidities presented with bruises and thrombocytopenia after Moderna vaccination. He was admitted as suspected case of post-vaccination ITP. [18] April 6, 2021, a refractory case of ITP was reported. He presented with acute epistaxis and diffuse cutaneous purpura a few hours after receiving the first dose of the Moderna SARS-CoV2 vaccine. [19]

So, in our case report post-vaccination (AstraZeneca) ITP is a high possibility, especially when Both patients were healthy and had a normal platelet count prior to receipt of the vaccine and developed thrombocytopenia with symptomatology 1-3 weeks post vaccination and other possibilities of thrombocytopenia were excluded.

Conclusion:

Although post-vaccination ITP is a rare adverse event, it should not limit the use of SARS-CoV2 vaccines. Additional surveillance is needed to

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determine the true incidence of thrombocytopenia post AstraZeneca vaccination. Finally, we recommend checking platelet count in anyone who reports abnormal bleeding or bruising following vaccination.

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