Parallel Pathogens: Coexistence of Chickenpox and Idiopathic Thrombocytopenic Purpura - A Case Report

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Introduction:

Varicella-zoster virus (VZV) is the causative agent of chickenpox, a viral rash that is generally benign and self-limiting, requiring minimal treatment. However, in rare cases, complications can arise. Although chickenpox is commonly associated with mild thrombocytopenia in children, severe thrombocytopenia resulting in bleeding is uncommon [1]. Immune Thrombocytopenia (ITP) is a blood disorder characterized by the destruction of platelets through immune-mediated mechanisms, leading to a decrease in platelet count below 100×10ˆ9/L. Viral infections and live virus vaccinations are frequent triggers of ITP. It presents as acute, self-limiting episodes of bleeding, usually minor, but with the potential for intracranial hemorrhage (ICH). Compared to other causes of thrombocytopenia, ITP typically results in less severe bleeding. Diagnosis is based on clinical presentation and laboratory findings, and it is a diagnosis of exclusion [2]. The primary goal of treating a patient with ITP is to raise their platelet count to a safer level, reducing the risk of severe bleeding, particularly intracranial hemorrhage (ICH). Corticosteroids have been effectively used since the 1950s, reducing the production of anti-platelet antibodies and enhancing the clearance of opsonized platelets. Intravenous immunoglobulin (IVIG), introduced by Imbach et al., has also shown high efficacy in increasing platelet counts in over 80% of patients, with a faster onset of action compared to steroids [3].

The coexistence of chickenpox and ITP presents a clinical conundrum, as the underlying mechanisms linking these conditions remain elusive. Although there are sporadic reports in the medical literature of patients developing ITP following chickenpox, the incidence of this simultaneous presentation is exceedingly rare. Furthermore, the majority of these reported cases lack comprehensive hematologic data, hindering a thorough understanding of the clinical course and management strategies.

We thus present one such intriguing and rare case of chickenpox with simultaneous ITP purpura.

Case Report:

We present the case of a 15-year-old girl with no significant medical history who was admitted to the hospital for 2 weeks with chief complaints of shortness of breath, right-sided chest pain, and sudden dizziness. She mentioned of heavy menstrual loss a day prior to the onset of these symptoms. The patient denied recent sick contacts, travel, or taking medications. On physical examination, she had anicteric sclera, severe conjunctival pallor, normoactive bowel sounds, and a non-tender, non-distended abdomen without hepatosplenomegaly. She was afebrile (38.6 °C), her blood pressure was 80/46 mmHg, her heart rate was 120 beats per minute (bpm), and her respiratory rate was 32 breaths per minute (bpm). The physician suggested the patient get some clinical laboratory tests done and transfused a unit of blood the same day. Investigations showed microcytic hypochromic anemia (possibly due to iron deficiency) with thrombocytopenia in PBF, serum

ferritin5.16 ng/ml hemoglobin 7.3 g/dl, ESR 85 mm/1st hr, platelet counts 15000/cu.mm. , RBC count 3.03 million/cu.mm with HCT/PCV 24%, HBsAg(ICT) negative, HIV 1&2 negative. The patient then gets conservatively managed with 2 units of blood transfusion, tab. prednisolone, Cap. ferrous sulfate + zinc + folic acid, and various symptomatic medical treatments. Her anemia gradually improved and she was discharged after 8 days when her hemoglobin and ESR reached 12.0 g/dl and 15 mm/1st hr, respectively, with a suggestion of regular follow-up.

After eight weeks, the patient experienced the similar symptoms as earlier following heavy menstrual blood loss, and was brought to the hospital. This time, she came up with vesicular skin a rash across her face, neck, and chest, which she had developed two days before admission. Figure 1. Initial laboratory workup showed 5.6 grams/dl hemoglobin, ESR 72 mm/1st hr, with RBC count 2.11 million/cu.mm, HCT/PCV 87%, Total platelet count 47000/cu.mm, and mild leukocytosis, PBF, and bone marrow study illustrated Immune Thrombocytopenic purpura (ITP), ultrasound report of the whole abdomen reveals normal, HBsAg negative, immunological reports (ANA & anti ds DNA), CT report and biochemical study of blood displayed normally. Table 1. Clinically, she was diagnosed with chicken pox and treated with acyclovir, paracetamol, antihistamines, hydration, folic acid +zin, and three units of blood transfusion for severe anemia. Gradually, the patient's condition improved anemia, symptoms of chickenpox disappeared, and other parameters returned to normal, and she was allowed to go home after 19 days with the advice of regular follow-up.

Discussion:

This case report presents the clinical course and management of a 15-year-old girl who was diagnosed with chicken pox and simultaneous immune thrombocytopenic purpura (ITP). Chicken pox is a highly contagious, self-limiting, exanthematous infection caused by varicella-zoster virus [1,4,5]. While chickenpox is typically a mild and self-limiting disease in healthy children, severity of complication is higher among adults and those who are immunocompromised. One of the hematological complications reported is immune thrombocytopenia [6]. Several studies have shown the association between chickenpox and immune thrombocytopenia (ITP) in both children and adults [1,5]. In this case, we presented a rare occurrence of simultaneous chickenpox and immune thrombocytopenic purpura (ITP). In review of literature, we found a single case reported with a similar case scenario where a 11-year-old boy presented with hemorrhagic vesicular rashes, petechiae, ecchymosis, epistaxis, hematuria and melena, dated back in 1947 [4]. In our case, limited availability of similar studies has imposed significant limitations in terms of evidence-based decision-making, diagnostic accuracy and patient management.

ITP is defined as the isolated platelet count below 100,000/microliter without other hematological abnormalities [7]. Although, ITP occur both in acute and chronic form, around 80% of childhood disease are of acute manifestation [8]. It usually presents with ecchymosis, petechiae, mucosal bleeding, nasal bleeding and excessive menstrual bleeding in case of female. However, sometimes it may be an incidental finding without any bleeding manifestation [2]. The pathogenesis of ITP is not fully understood, and the exact cause remains unclear. However, the known etiopathogenesis include production of autoantibodies that target platelet surface glycoproteins resulting in accelerated platelet clearance by macrophages, impaired platelet production in bone marrow and increased reactivity of T cells against platelets [9]. In this case, presence of anemia alongside ITP also raised the possibility of immune mediated mechanism causing anemia. To further investigate such case, Coombs test to evaluate the presence of immune mediated hemolysis could have been done.

According to the recommendation from American Society of Hematology (ASH) corticosteroids are considered as the first line therapy for ITP. However, in cases where corticosteroids are contraindicated ASH guideline suggest considering intravenous immunoglobulin or anti D immunoglobulin as alternative treatment options [10]. Comparing the two modalities, systematic review and meta-analysis conducted by Beck CE et.al, concluded that children treated with corticosteroids are 26% less likely to rise platelet level than those who are treated with intravenous IVIG [11]. Despite this, corticosteroids are usually the first choice due to ease of administration and low cost [12]. 11Thrombopoietin receptor agonist such as eltrombopag and romiplostim, anti CD20 antibody rituximab and surgical splenectomy are considered as second line thera-

pies for the cases lasting more than three months and not responding to first line therapies [10]. While bone marrow transplantation has shown promise as a potential treatment option in cases where other modalities have failed, its complexity and possible complications currently prevent it from being considered a standard treatment approach [13,14].

Simultaneous occurrence of chicken pox demands comprehensive evaluation. In order to rule out any potential neurological complications, CT scan was performed, although it is worth noting that such complications are rare but have been reported in association with chickenpox [15]. CDC recommends anti-viral therapy for the unvaccinated children older than 12 years old and therefore acyclovir was initiated along with supportive measures. Intravenous acyclovir given withing 72 hours of disease onset is considered very effective especially for those who are at risk of severe disease [4].

This case report highlights the importance of timely diagnosis, appropriate management strategies such as supportive care, antiviral treatment and blood transfusions and regular follow up in achieving successful outcomes. Health care providers should be vigilant about the co-occurrence of these diseases so that timely intervention can be done to prevent possible complications. Further reporting of similar cases and research are warranted to better understand the underlying mechanisms and optimize the management of these dual diagnoses.

Conclusion:

In conclusion, this case report highlights a rare occurrence of simultaneous chickenpox and immune thrombocytopenic purpura (ITP) in a 15-year-old girl. A careful review of the patient's clinical presentation, laboratory data, and exclusion of additional potential causes of thrombocytopenia established the diagnosis of ITP. The patient had typical ITP symptoms, such as rashes and a considerable reduction in platelet count. Prompt identification and care are critical for avoiding complications. Our patient underwent supportive care, which included blood transfusions, corticosteroids, and intravenous immunoglobulin (IVIG) therapy. Her platelet count promptly improved as a result of this multimodal treatment, and she recovered completely from both chickenpox and ITP. Follow-up visits were scheduled on a regular basis to evaluate her progress and ensure that she was not experiencing relapse. Further study is needed to understand the etiology and underlying processes that link chickenpox and ITP. Larger studies are also required to determine the most efficient methods of therapy for this unique combination of illnesses. Reporting such cases through publications will broaden our collective knowledge and help us provide comprehensive care for those with comparable clinical features.

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Declaration of patient consent

Written informed consent was obtained from the patient for publication of this case report and

accompanying images. A copy of the written consent is available for review by

the Editor-in-Chief of this journal on request.

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Conflicts of Interest

There are no conflicts of interest.

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Figure legend:

Figure 1. Maculopapular rashes showing over the face.

Table legend

Table 1: Bone marrow biopsy report

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