Reactive thrombocytosis with severe anemia and infection in a Sudanese patient: A case report

Zainab Alghali Elsaid Muhammed[1], Mohammed Alfatih[2], Ashraf Babiker[3], Khadeega Aldau[4], Mona mohamed[4], Hamza Hajali[5], Maysam Gharbawi[6], Mohannad Abdalfdeel Almahie Shaban[2], and Abdellatif Ahmed[5]

[1]Shendi University
[2]Alzaiem Alazhari University Faculty of Medicine
[3]University of El Fasher
[4]Martyr Ali Abdel Fattah Hospital
[5]Sudan Medical Specialization Board
[6]National University - Sudan Faculty of Medicine

August 18, 2022

Abstract

Secondary thrombocytosis, also known as reactive thrombocytosis defined as an abnormally high platelet count due to underlying events, disease, or the use of certain medications. We report a case of 20 years old Sudanese female with high-grade fever, right iliac fossa pain and a past history of undiagnosed anemia.

Reactive thrombocytosis with severe anemia and infection in a Sudanese patient: A case report

Zainab Alghali Elsaid Muhammed, Mohammed Alfatih, Ashraf Saeed Hussein Babiker, Khadeega Mohammed Ahmed Aldau, Mona babiker alattaya mohamed, Hamza Elsiddig Hajali, Maysam ELsayed Saeed Gharbawi, Mohannad Abdalfdeel Almahie Shaban, Abdellatif Ahmed

Authors Affiliations:

Zainab Alghali Elsaid Muhammed

First author

Shendi University

zooobaalghali@gmail.com

Mohammed Alfatih

Co-author

Alzaiem Alazhari University Faculty of Medicine

mohammed.22.alfatih@gmail.com

Ashraf Saeed Hussein Babiker

Co-author

University of El Fasher

elrasasisaeed@gmail.com

Khadeega Mohammed Ahmed Aldau

Co-author

Martyr Ali Abdel Fattah Hospital, Medical officer at medicine department

khadeegaaldau@gmail.com

Mona babiker alattaya mohamed

Co-author

Martyr Ali Abdel Fattah Hospital, Medical officer at medicine department

monaalattaya1990@yahoo.com

Hamza Elsiddig Hajali

Co-author

mezo.80@hotmail.com

Sudan Medical Specialization Board, Internal Medicine Resident

Maysam ELsayed Saeed Gharbawi

Co-author

National University - Sudan Faculty of Medicine

maysam2099@gmail.com

Mohannad Abdalfdeel Almahie Shaban

Co-author

Alzaiem Alazhari University Faculty of Medicine

mo199687@gmail.com

Abdellatif Ahmed

Supervisor

Sudan Medical Specialization Board, Internal Medicine Specialist

abdalteifahamed@gmail.com

Abstract:

Secondary thrombocytosis, also known as reactive thrombocytosis defined as an abnormally high platelet count due to underlying events, disease, or the use of certain medications.

We report a case of 20 years old Sudanese female with high-grade fever, right iliac fossa pain and a past history of undiagnosed anemia.

KEYWORDS:

Reactive thrombocytosis, iron deficiency anemia, Sudanese, infection

INTRODUCTION

Secondary thrombocytosis, also known as reactive thrombocytosis defined as an abnormally high platelet count due to underlying events, disease, or the use of certain medications. Secondary thrombocytosis is

the more common type and is usually identified in routine laboratory results. Among individuals with thrombocytosis, 80% to 90% are known to have secondary thrombocytosis .[1]

Reactive causes of thrombocytosis include transient processes such as acute blood loss, acute infection, or sustained forms of reactive thrombocytosis including iron deficiency, asplenia, cancer, chronic inflammatory, or infectious diseases. Secondary thrombocytosis (reactive thrombocytosis) is a laboratory anomaly that resolves when the underlying causative condition is addressed. [2] In most cases, the symptoms are due to an underlying disorder and not the thrombocytosis itself. Extreme thrombocytosis may rarely result in thrombotic events such as acute myocardial infarction, mesenteric vein thrombosis, and pulmonary embolism. [3]

PATIENT INFORMATION

Our patient is a 20 years old Sudanese female who was admitted to our medicine department in Alshuhada hospital on June 2022 with a chief complaint of high-grade fever and right iliac fossa pain radiating to the back for 1 day. There was no associated nausea, vomiting, change in bowel habits or weight loss.

Personal history revealed that the patient had pica symptoms in the last two years as she consumed a large amount of ice on a daily basis. She has normal menstrual cycle history for the past two years. She has no family history of chronic diseases or anemia. Her social history was unremarkable for smoking, alcohol drinking and she was not sexually active.

EXAMINATION

Examination revealed a fully conscious patient (GCS = 15), pulse was 110 beats per minute, and blood pressure was 80/60 mmHg.

Upon examining her skin and mucus membrane, skin and conjunctival was pallor (Figure 1). Atrophic glossitis and angular stomatitis were noted also (Figure 2). There was no oropharyngeal erythema or any signs of inflammation. The oral mucosa and gingiva were normal without lesions.

Figure (1): Shows pallor of the skin and conjunctiva

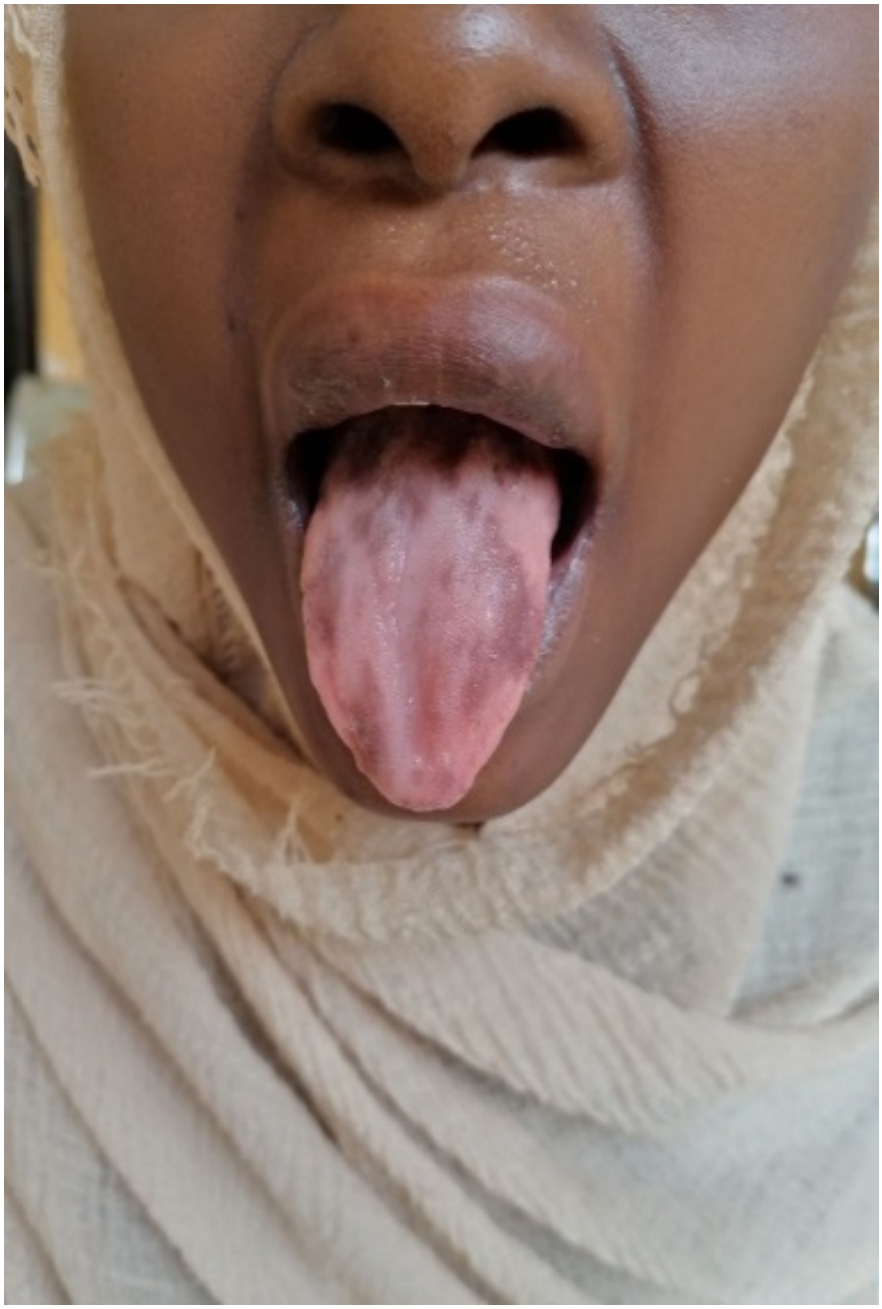

Figure (2): Shows angular stomatitis, atrophic glossitis and

multiple brown hyperpigmented macules on the dorsal surface.

Her Cardiac examinations revealed normal first and second heart sounds. When examining her abdomen, her liver and spleen were not palpable, the only finding was a pain in the right iliac fossa without rigidity or rebound tenderness. The patient was also examined by the surgical department to rule out the acute abdomen.

INVESTIGATIONS:

Initial laboratory workshop for her revealed anemia with hemoglobin = 3.5 g/dl, HCT = 12.4%, mean corpuscular volume = 55.1fl, platelets =1007 ×10ˆ3 /µl which is very high and total WBC was also high (14.9 × 10ˆ3/µl) with Neutrophils about 80%. The renal function test plus electrolytes, and liver function test were all normal.

The abdominal ultrasound confirmed the presence of Pelvic inflammatory disease " PID ". It showed mild to a moderate collection of fluid in the posterior cul-de-sac and multiple tiny calculi near her right kidney.

Peripheral blood picture shows anisocytosis and poikilocytosis, microcytic hypochromic RBCs associated with target cells, pencil cells, teardrops cells and polychromies cells and with leukocytosis and very high platelets in the film. Based on the presence of low hemoglobin, HCT, low MCV, high platelet count and findings on the peripheral blood picture, iron studies and bone marrow biopsy were requested.

Unfortunately, iron parameter tests and bone marrow biopsy were not available in the hospital and the patient refused to be referred to another hospital to do these tests.

TREATMENT AND FOLLOW-UP:

With regard to the treatment this patient received, it was mainly supportive in nature since we did not confirm the diagnosis this patient may have. The patient was hypotensive and immediately received two Normal saline units of 0.9 % 500 ml infusion in the emergency room and was requested to do the route investigations.

On-ward patient immediately received Ceftriaxone 1gm IV and was requested to do peripheral blood picture which revealed anisopoikilocytosis and severe microcytic hypochromic cells.

For the second, third and fourth day the patient received 3 units of blood. She continued to have Ceftriaxone 1gm IV injections and potassium citrate powder. The patient remarkably improved. Her platelet count was followed on the 4th day which showed improvement to (720 ×10ˆ3 /µl).

The patient was followed up in the referred clinic for a period of 12 days with no significant complications and another platelet count followed 8 days after discharge which was normal (260 × 10ˆ3 /µl).

Finally, the patient was requested to do iron studies and a bone marrow biopsy but she neglected to continue the investigation. No further workup was done as the patient's symptoms and conditions improved rapidly and the patient refused to come to the follow-up.

DISCUSSION

The mechanisms causing reactive thrombocytosis in iron deficiency anemia are unknown. There are several reports to elucidate the mechanisms of reactive thrombocytosis from the aspect of thrombopoietic cytokines. Akan et al assayed the serum levels of thrombopoietin, erythropoietin, leukemia inhibitory factor, IL-6 and IL-11, but none of these cytokines had any effect on reactive thrombocytosis in iron deficiency anemia.[(4)]

A case report of V. Uzel et al about severe thrombocytosis in iron deficiency anemic 12 years old girl concluded that the cause of thrombocytosis in iron deficiency is not fully understood. The fact that the increase in EPO stimulates TPO receptors (c-mpl) in iron deficiency is known to result in thrombocytosis. However, it is very important that children should be evaluated immediately for infection and iron deficiency before performing further examinations. [(5)]

Treating the reactive thrombocytosis caused by iron deficiency with iron supplements has shown to be very effective and would rapidly correct the platelet count.

In a case report by Kristin Bergmann et al of 34 old woman who had undergone bariatric surgery 5 years previously, a diagnosis of reactive thrombocytosis due to iron deficiency secondary to iron malabsorption was made. Their finding emphasizes the importance of regular control of the possible need for iron supplementation following bariatric surgery[(6)].

In another case report of arterial and venous thrombosis caused by reactive thrombocytosis and iron deficiency anemia, Deepak Venugopalan Pathiyil et al concluded the patient's significant response to treatment with simple iron replacement.

The clinical examination for this patient is suggesting the presence of anemia (the severe pallor in the hands and conjunctiva). Also, the hyperpigmentation in her tongue is suggesting the presence of Pigmented fungiform papilla because there are no associated skin, nail, or other cutaneous changes.

The pigmented fungiform papilla is a normal variant of the tongue that has no associated pathologic significance. This finding usually presents in late childhood and does not change over time [(7)]. More common in patients with dark skin but may be found in any race.

The characteristics and colour of the pigmentation vary and the most common presentation is diffuse patches or macules on the dorsal surface of the tongue. The patches may be seen on the anterior and lateral surface of the tongue or at the tip of the tongue. The colour variation of these patches may range from brown to dark black[(8)].

In this case, the patient refused to do iron studies and bone marrow biopsy. She was offered counselling many times on how these investigations would help with the management. Therefore, No iron supplements were prescribed to the patient. She only agreed to have a short course of antibiotics (Ceftriaxone IV injection) and 3 units of blood.

The patient improved quickly after the treatment commenced. The platelet count rapidly decreased on the 4^{th} day after admission and returned to normal level on the 12^{th} day.

CONCLUSION

Reactive thrombocytosis should always be considered in patients present with severe iron deficiency anemia and infection.

This case showed that in the absence of iron supplements therapy, The reactive thrombocytosis state for this patient improved quickly by only treating the infection and the anemia.

The hemoglobin level and platelet count should be followed closely in patients with reactive thrombocytosis to prevent fatal complications of anemia. Iron studies and bone marrow biopsy are mandatory to rule out any bone marrow malignancies and to reach the definitive diagnosis.

CONFLICTS OF INTEREST

The authors report no conflict of interest.

CONSENT

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

References:

1. Buss DH, Cashell AW, O'Connor ML, Richards F, Case LD. Occurrence, etiology, and clinical significance of extreme thrombocytosis: a study of 280 cases. Am J Med. 1994 Mar;96(3):247-53. [PubMed] .
2. Rokkam VR, Kotagiri R. Secondary Thrombocytosis. [Updated 2022 Apr 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan
3. Khan PN, Nair RJ, Olivares J, Tingle LE, Li Z. Postsplenectomy reactive thrombocytosis. Proc (Bayl Univ Med Cent). 2009 Jan;22(1):9-12. [PMC free article] [PubMed]
4. Akan H, Guven N, Aydogdu I, Arat M, Beksac M, Dalva K. Thrombopoietic cytokines in patients with iron deficiency anemia with or without thrombocytosis. Acta Haematol 103: 152–156, 2000
5. v. Uzel , S. SavaŞ, M. Soker The cause of very severe thrombocytosis: iron deficiency anemia (October 2020) Hematology, Transfusion and Cell Therapy. Volume 42 , DOI : 10.1016/j.htct.2020.09.125

6. Kristin Bergmann and Olav J Bergmann An unusual case of extreme thrombocytosis caused by iron deficiency BMJ Case Rep. 2020 Doi: 10.1136/bcr-2019-231833
7. Mukamal Luana V, Ormiga Patrícia, Ramos-E-Silva Marcia. Dermoscopy of the pigmented fungiform papillae of the tongue. The Journal of dermatology. 2012;39:397–399.
8. Holzwanger J. M., Rudolph R. I., Heaton C. L. Pigmented fungiform papillae of the tongue: A common variant of oral pigmentation. International Journal of Dermatology. 1974;13:403–408.