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Platelet satellitism: A rare phenomenon

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Abstract

Platelet satellitism is a rare *in-vitro* phenomenon seen only in Ethylenediaminetetraacetic acid (EDTA) anticoagulated blood. Platelets form rosette around polymorphonuclear neutrophils in this phenomenon. Platelet satellitism is one of the causes of pseudothrombocytopenia. This may lead to unnecessary diagnostic work up and treatment of the patient. We report a case of platelet satellitism in a 2 year old child who presented with fever and associated with normal platelet count for its rarity.

Keywords: Ethylenediaminetetraacetic acid, platelet satellitism, pseudothrombocytopenia

Introduction

Platelet satellitism is a rare *in-vitro* phenomenon seen only in Ethylenediaminetetraacetic acid (EDTA) anticoagulated blood.¹ It is not observed in blood samples collected in other anticoagulants like heparin and sodium citrate ^[2]. Platelets form rosette around polymorphonuclear neutrophils in this phenomenon.¹ Platelet satellitism was first reported by Field and Macleod in 1963 ^[3].

The exact underlying mechanism for platelet satellitism is yet to be understood. It is usually an accidental finding during peripheral blood smear examination for thrombocytopenia or other conditions ^[4]. Clinically it is important because of its association with spurious thrombocytopenia ^[2].

Case- report

A blood sample of 2 year old female child was received in Clinical Pathology laboratory for complete counts. She had a history of fever and cold since 8 days was treated with Azithromycin and Paracetamol by a general practitioner. General physical examination showed high temperature, no organomegaly, no lymphadenopathy, no skin rashes, mucosal lesions, petechiae and ecchymoses.

Blood sample was obtained by venipuncture in vacutainer tube containing 5.4 mg of K2-EDTA with a capacity of 3 ml. The vacutainer sent to us had 2 ml of blood sample. An automated complete blood count was performed on ABX Pentra XL 80 analyser (HORIBA). Leishman stained smears were made from EDTA anticoagulated blood within 2 hours of collection.

Complete blood count findings were as follows; total leukocytes 8,100/ μ L, total red blood cells 4.52 million/ μ L, haemoglobin 10.7 g/dL, platelets 1,82,000/ μ L, with a differential count of 43% neutrophils, 48% lymphocytes, 8% monocytes, and 1% eosinophils. A peripheral smear made from EDTA anticoagulated blood showed few polymorphonuclear neutrophils ringed completely or partially with platelets (platelet satellitism), the platelets surrounding the neutrophils numbered from 10 to 25.

Discussion

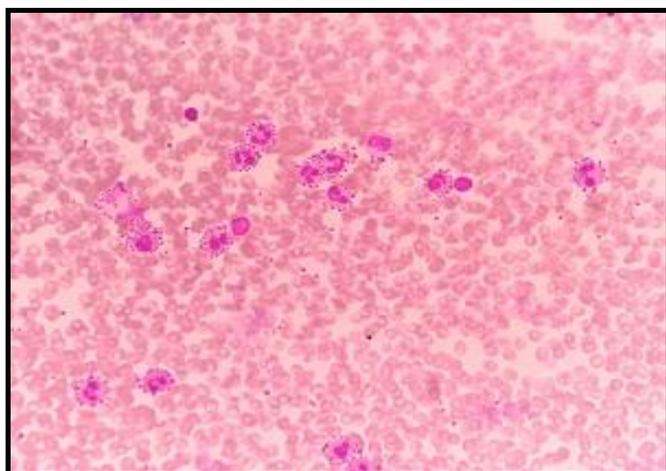
In platelet satellitism the platelets adhere to polymorphonuclear neutrophils forming a ring around it. In the present case platelet satellites were not seen around other leukocytes. On light microscopy platelets showed normal morphology. The exact cause of this phenomenon is still unknown and only peripheral smear made from EDTA blood only will show this phenomenon ^[5].

According to bizzaro *et al.* platelet satellitism is caused by detection of EDTA modified glycoprotein IIb/IIIa on platelet membrane by IgG antibodies and EDTA dependent binding of antibodies to Fc γ RIII in polymorphonuclear neutrophils ^[4].

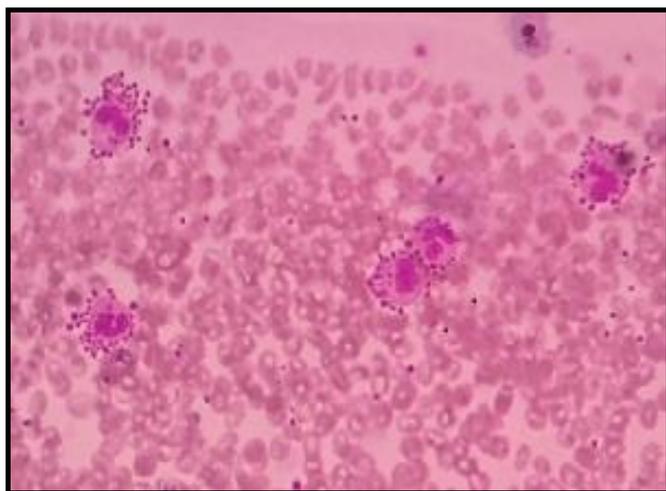
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The role of thrombospondin in platelet satellitism has also been suggested [1].

The clinical significance of this phenomenon is that it causes spurious thrombocytopenia [6-8] Platelet satellitism is most commonly seen in healthy individuals. It has also been observed in mantle cell lymphoma, lupus and vasculitis [9]. In our case platelet satellitism was associated with viral fever and normal platelet count, follow up after 2 weeks revealed child was healthy. Healthy individuals with platelet satellitism on long term follow up have shown no adverse consequences [10].



Legend 1: Leishman stained peripheral blood smear at 400X magnification showing neutrophils surrounded by platelets (platelet satellitism)



Legend 2: Leishman stained peripheral blood smear at 400X magnification showing neutrophils surrounded by platelets (platelet satellitism)

Conclusion

Platelet satellitism is one of the causes of pseudothrombocytopenia. This may lead to unnecessary diagnostic work up and treatment of the patient. So it is important for pathologist to be aware of this phenomenon. Platelet satellitism associated pseudothrombocytopenia can be identified by examining peripheral blood smear of the patient. Simultaneous collection of blood samples in EDTA and other anticoagulants like heparin, sodium citrate and comparison of platelet counts between these samples will help rule out pseudothrombocytopenia.

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