

# Transplacental transmission of EDTA dependent pseudothrombocytopenia in a neonate

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## ABSTRACT

**Verifying platelet counts can prevent unwarranted diagnostic tests and transfusions. In case of thrombocytopenia, if the clinical picture and history do not suggest bleeding tendency, one should always perform peripheral blood smear by directly obtaining blood by finger puncture before doing any further tests. If the peripheral blood smear exhibits platelet clumps, pseudothrombocytopenia should always be remembered. In this case, we present a neonate with a diagnosis of transplacental transmission of EDTA-dependant pseudothrombocytopenia.**

**Keywords:** Thrombocytopenia; Pseudothrombocytopenia; Neonate

## 1. INTRODUCTION

Pseudothrombocytopenia or spurious thrombocytopenia is an *in vitro* laboratory finding usually associated with the use of ethylenediamine tetraacetic acid (EDTA) in blood collection tubes [1]. It is due to platelet clumping when blood is anticoagulated with EDTA. EDTA while binding calcium ions releases glycoprotein IIb (GpIIb) epitope by interacting with the glycoprotein IIb-IIIa (GpIIb-IIIa) molecule on the platelet membrane [2,3]. If the patient has autoantibodies (usually IgG type immunoglobulins) against these epitopes, they cause clumping of these platelets by binding to the epitopes on their surfaces. These thrombocyte clumps are considered as leukocyte by the automated blood counters due to their volumes and so the platelet counts are estimated as low.

We describe a case of transient congenital pseudothrombocytopenia in a baby born to a mother with pseudothrombocytopenia.

## 2. CASE REPORT

A 28 year old woman was found to have persistent thrombocytopenia by routine electronic blood counting.

There was no history of bleeding tendency though her first childbirth was via C/S. In her second pregnancy, the automatic platelet count on EDTA-anticoagulated sample was 33.000/mm<sup>3</sup>; her peripheral blood smear exhibited multiple platelet clumps. Her blood was collected in heparin anticoagulated tube and her platelet count was 184.000/mm<sup>3</sup>. She was diagnosed as EDTA dependant pseudothrombocytopenia. She delivered her baby via C/S without complications.

The laboratory analyses of newborn show that thrombocytopenia with a level of platelet count 56.000/mm<sup>3</sup>. She had no bleeding tendency. In her blood smear, several large platelet clumps were detected. We considered that this low platelet count might be due to EDTA-induced aggregation of the platelets. Therefore, we measured platelet count of his blood samples obtained by venipuncture in different test tubes, each containing sodium citrate or standard heparin. Platelet counts of blood samples in test tubes containing sodium citrate or heparin were found to be 154.000/mm<sup>3</sup> and 161.000/mm<sup>3</sup>, respectively. So the baby was considered to have pseudo thrombocytopenia and discharged from the hospital. Finally, during her last follow up visit, she was 6 months old and the baby's platelet count was normal, even in the presence of EDTA. Repeat counts performed over the following months showed persistence of pseudothrombocytopenia in the mother.

## 3. DISCUSSION

The prevalence rate of EDTA-dependent pseudothrombocytopenia was reported as 0.07% to 0.20% in the literature. [4]. It is almost always discovered during routine hematologic tests. Pseudothrombocytopenia is seen in patients whose blood is taken into EDTA containing tubes. The incidence of autoantibodies causing clumping of platelets due to the presence of EDTA is 1/1000 in humans [5]. These autoantibodies are either present life-long time or may be temporary secondary to the presence of infections or use of drugs. These autoantibodies

can cross the placenta and cause thrombocytopenia in neonate [5]. This case documents transplacental transmission of the plasmatic factor probably an IgG, responsible for pseud thrombocytopenia. If there is thrombocytopenia, a peripheral blood smear with blood counts, taken into tubes containing citrate or heparin as anticoagulant should be performed.

In case of low thrombocyte level which obtained with an electronic counter peripheral smear should be prepared from both patient's fingertip and blood sample with EDTA. Also platelet count should be repeated with another anticoagulant like citrate or heparin instead of EDTA. Repeated thrombocyte counts with other anticoagulants are usually found normal in range. Thrombocytes sometimes surround in leucocytes (thrombocyte satellism) which form a cluster. These clusters can not be counted correctly by electronic blood counter instruments. So this should be ruled out when thrombocytopenia is detected. It should be kept in mind that low thrombocyte counts can be obtained due to aggregation of thrombocyte when blood samples are taken improperly (insufficient mix of anticoagulant and blood sample, difficulty in venous access). When low platelet counts are found from the blood samples of patients whom have been difficulties in venous access, peripheral blood smear should be done and examined under microscope.

MPV (mean platelet volume) is also measured in full blood count instruments beside thrombocyte count. In patients with low platelet levels; if MPV value is high the differential diagnosis should include acute ITP, Bernard-Soulier syndrome and also one should always remember the possibility of formation of thrombocyte

clusters and further investigation should be performed according to these causes .

One has to decide if thrombocytopenia is real or pseudo before making further diagnostic tests, a peripheral smear should always be done with complete blood counts.

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