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Case Report

# Severe Neonatal Autoimmune Thrombocytopenia in a Mother with Chronic ITP After Splenectomy: Treated Successfully with IVIG, Case Report

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## Abstract

Neonatal autoimmune thrombocytopenia occurs due to the transplacental passage of maternal antiplatelet antibodies and is seen in approximately 10% of neonates born to mothers with immune thrombocytopenia (ITP) or systemic lupus erythematosus (SLE). Although most cases of neonatal autoimmune thrombocytopenia are asymptomatic in rare instances, neonates might develop severe thrombocytopenia that can lead to life threatening bleeding, including Intracranial hemorrhage. Considering those potential consequences, early platelet number determination and other necessary investigations will be beneficial for better outcomes. Intravenous immunoglobulin is the first line of treatment, with most neonates responding to it without requiring transfusions. We report a case of neonatal autoimmune thrombocytopenia in a term male neonate born to a 25 year old woman with chronic ITP. The mother had a splenectomy for refractory thrombocytopenia despite steroid treatment. The neonate was asymptomatic but had thrombocytopenia with a nadir platelet count of 8,000/μL in routine evaluation prompted by maternal ITP history. He was treated with Intravenous Immunoglobulin at 1 g/kg/day for 5 days, without requiring platelet transfusion or experiencing any clinical complication. In subsequent post treatment followups (fourth month) the platelet count increased gradually, reaching 348,000/μL in the fourth month. This case highlights the importance of early detection and treatment of neonatal autoimmune thrombocytopenia, even in the absence of clinical symptoms.

## Keywords

Neonate, ITP, Thrombocytopenia, Neonatal Autoimmune Thrombocytopenia, Splenectomy

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## 1. Introduction

Multiple studies have established the normal platelet number ranges between 150,000/μL and 450,000/μL. Neonates with a platelet count below 150,000/μL are considered thrombocytopenic. Of all live births 1-5% have thrombocytopenia, 0.1-0.5% being severe thrombocytopenic (platelet count < 50,000/μL). Neonates who are admitted to NICU have a higher chance of being thrombocytopenic, 22 - 35% of admitted cases. Preeclampsia, sepsis, prolonged rupture of membrane, prematurity, perinatal asphyxia and necrotizing enterocolitis are some of the risk factors associated with neonatal thrombocytopenia.

In some newborns, a low platelet count can be caused by the mother's immune system. This happens when certain antibodies from the mother cross the placenta and attack the baby's platelets. There are two main types of this condition. One is called neonatal alloimmune thrombocytopenia, which occurs when the mother's immune system reacts to the baby's platelets as if they were foreign. The other is neonatal autoimmune thrombocytopenia, which usually affects babies born to mothers with immune conditions like immune thrombocytopenia (ITP) or lupus. While autoimmune thrombocytopenia tends to be less severe, both types can still cause serious problems — including Intracranial hemorrhage (ICH).

Maternal platelet count does not reliably predict neonatal platelet count, but screening is recommended in cases of maternal thrombocytopenia, especially with autoimmune causes or a history of splenectomy. Severe neonatal thrombocytopenia, even in the absence of symptoms, requires prompt recognition and treatment to avoid serious outcomes.

Here, we present the case of a term male neonate born to a 25-year-old mother with chronic ITP and prior splenectomy, who developed severe thrombocytopenia and was successfully treated with intravenous immunoglobulin (IVIG).

## 2. Case Presentation

A male neonate born from 25 years old para 2 mothers at 39+6 weeks via spontaneous vaginal delivery. The mother has been a chronic ITP patient for 14 years. She has been treated with prednisolone which increases the platelet count for a while. Despite the treatment she experienced multiple severe thrombocytopenias requiring hospital admission and platelet transfusion. For steroid-refractory thrombocytopenia she underwent a splenectomy 11 years ago. Despite the splenectomy her platelet count was between 30,000/μL and 40,000/μL for a long time, requiring transfusions in multiple visits. She has delivered a healthy male neonate at term four years ago without maternal and neonatal complications; the child is alive, healthy and has developed appropriate for his age.

She has regular antenatal care without requiring platelet transfusion. Workups for HIV, VDRL and Hepatitis-B-viruses were negative. Obstetric ultrasound was appropriate for the gestational age. There were no maternal comorbidities, like hypertension or diabetes mellitus. During pregnancy she took two doses of tetanus toxoid vaccine and iron supplementation.

Labor started spontaneously at 39+6 weeks and lasted 11 hours with intrapartum rupture of membrane 30 minutes before delivery. A 3.2 kg male neonate born with APGAR score of 8 and 9 at first and fifth minute, respectively. Considering the maternal history the baby was taken to NICU, despite being clinically stable and has no petechiae, bruising or rash.

The first platelet count being 18,000/μL, serial CBC was done with nadir being 8,000/μL on the third day. The neonate was treated with intravenous immunoglobulin (IVIG) at 1 g/kg/day for 5 consecutive days: without platelet transfusion. The platelet count reached 132,000/μL when discharged on the 10th day. Transfontanelle ultrasound was done which shows no abnormality (i.e Intracranial hemorrhage). Then the neonate has follow-up at a high risk pediatric clinic; on the fourth month platelet count was 348,000/μL and development is appropriate for age. The serial CBC results are presented in the following table.

***Table 1.*** *Serial CBC value of the neonate.*

| DATE | Day 1 | Day 3 | Day 6 | Day 7 | Day 10 | 4 months |
|---|---|---|---|---|---|---|
| WBC (μL) | 16100 | 13800 | 18500 | 13800 | 13500 | 7700 |
| Neutrophil (%) | 80.3 | 60.5 | 69.5 | 44.4 | 46.4 | 23.9 |
| Lymphocyte (%) | 11 | 18.4 | 10.3 | 29.3 | 25.5 | 60 |
| HCT (%) | 58.4 | 63.9 | 54 | 59 | 49.5 | 34.4 |
| HGB (g/dL) | 19.3 | 20.6 | 18.7 | 19.3 | 16.4 | 12.3 |
| MCV (fL) | 111.8 | 114 | 106.2 | 111 | 108.2 | 106.3 |
| MCH (pg) | 36.9 | 37 | 36.2 | 36.3 | 35.9 | 27.4 |

| DATE | Day 1 | Day 3 | Day 6 | Day 7 | Day 10 | 4 months |
|---|---|---|---|---|---|---|
| PLATLET (×10³/μL) | 18 | 8 | 11 | 43 | 132 | 348 |
| MPV (fL) | 10.2 | 8 | 9.6 | 12.6 | 11.3 | 10.1 |

## 3. Discussion

Neonatal thrombocytopenia occurs in 1-5% of all newborns at birth and 22-35% in NICU admitted neonates. Among these 8% of preterm and 6% of NICU admissions developed severe thrombocytopenia [1]. Although 4-12% of pregnancies are complicated with maternal thrombocytopenia, there's weak correlation with neonatal thrombocytopenia. However, Neonates born to mothers with ITP or SLE have a 10% chance of developing neonatal autoimmune thrombocytopenia [1-4].

Neonatal autoimmune thrombocytopenia occurs due to transplacental passage of maternal antiplatelet antibodies to the fetus. This can result in decreased platelet count within the first few days of life, the nadir mostly being between 2nd and 5th day [1, 5, 6]. In contrast, there's another immune mediated thrombocytopenia called neonatal alloimmune thrombocytopenia (NAIT). NAIT occurs when maternal antibodies that react against alloantigens are found on the surface of fetal platelets. Unlike neonatal autoimmune thrombocytopenia, NAIT has higher risk of clinical complications [6-10].

Neonatal autoimmune thrombocytopenia is usually clinically asymptomatic. proactive screening in neonate for thrombocytopenia and intracranial hemorrhage (despite being in < 1% of cases) should be done to diagnose neonatal autoimmune thrombocytopenia. Having previous delivery complicated by neonatal autoimmune thrombocytopenia is a strong predictor in occurrence of neonatal autoimmune thrombocytopenia [1, 3, 11-13].

In the management of pregnancies complicated by maternal ITP, invasive procedures to take blood samples from the fetus should be avoided. After delivery cord platelet count should be determined as soon as possible. For those with platelet count < 100,000 /μL serial CBC should be done until stabilization. In addition to serial CBC, cranial ultrasound is recommended to assess intracranial hemorrhage when platelet count is < 50,000/μL. If ICH is found, MRI can be used for confirmation or clarification. In case of ICH steroids and IVIG is used to maintain the platelet count at optimal level. Neonates with symptomatic bleeding or platelet count < 30,000/μL should be treated with IVIG alone [1, 3, 9, 12, 14-16].

This case illustrates an example of early diagnosis and management of classic cases of neonatal autoimmune thrombocytopenia. Although the older brother has no history of neonatal thrombocytopenia, given the maternal history of chronic ITP and splenectomy history, screening has led to early diagnosis and management according to updated recommendations. Our patient had both serial CBC and cranial ultrasound investigations done, since the platelet count has been <30,000/μL on first evaluation. The favorable outcome in our patient can be attributed to the proactive neonatal evaluation and multidisciplinary approach to minimize the complications and ensure optimal outcome.

## 4. Conclusion

Severe neonatal autoimmune thrombocytopenia is a very rare clinical presentation, especially when prior delivery was uncomplicated. Despite most cases being asymptomatic with mild to moderate thrombocytopenia, early screening of neonates after delivery is crucial to optimal outcome. In our case, despite the presence of a healthy older sibling, the maternal history of chronic ITP and prior splenectomy significantly increased the neonate's risk. Therefore, immediate postnatal evaluation, including CBC, after delivery should be a custom in mothers with a history of chronic ITP or SLE. Such evaluations should be aimed at noticing complications and initiating treatment as early as possible.

## Abbreviations

| | |
|---|---|
| APGAR | Activity, Pulse, Grimace, Appearance, Respiration |
| HIV | Human Immunodeficiency Virus |
| ITP | Immune Thrombocytopenia |
| IVIG | Intravenous Immunoglobulins |
| NAIT | Neonatal Alloimmune Thrombocytopenia |
| NICU | Neonatal Intensive Care Unit |
| SLE | Systemic Lupus Erythematosus |
| VDRL | Venereal Disease Research Laboratory |

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## Author Contributions

**Ageru Zeleke Endalew:** Conceptualization, Data curation,

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**Andebet Sisay Deress:** Conceptualization, Data curation, Supervision, Validation, Writing – original draft

**Eden Haile Hagos:** Conceptualization, Data curation, Resources, Writing – original draft

**Elezer Berhanu Zewde:** Visualization, Writing – original draft, Writing – review & editing

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**Habtamu Ferede Kidanu:** Conceptualization, Validation, Writing – original draft

## Ethics Approval and Consent to Publication

Informed consent for publication of this case report was obtained from parents of the patient prior to submission.

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## Availability of Data and Materials

Not Applicable.

## Conflicts of Interest

The authors declare no conflicts of interest.

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