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# Neonatal Macrocytic Anemia Following in Utero Exposure to Triumeq (Abacavir/Dolutegravir/ Lamivudine): A Case Report

# Abstract

We report a case of neonatal macrocytic anemia in dizygotic twins born to an HIV-positive mother treated with Triumeq during pregnancy. Despite achieving an undetectable maternal viral load, both twins required NICU care for metabolic acidosis and respiratory distress and developed severe anemia necessitating transfusions. This is the first documented case of fetal and neonatal macrocytic anemia associated with Triumeq, highlighting the need for awareness of potential hematologic side effects of antiretroviral therapy (ART) in pregnancy.

# Introduction

Antiretroviral therapy (ART) has significantly reduced the risk of vertical transmission of HIV[5]. However, data on the long-term effects of ART on fetal and neonatal health remain limited. Triumeq, a fixed-dose combination of abacavir, dolutegravir, and lamivudine, is a preferred treatment for HIV-positive pregnant women due to its efficacy and low transmission rates [2]. We present a unique case of neonatal macrocytic anemia in twins born to a mother receiving Triumeq, contributing to the evolving understanding of ART's effects on neonates.

# **Case Presentation**

## Maternal History

A 29-year-old G2P1LC1 HIV-positive mother with a history of chronic hypertension treated with labetalol was admitted at 35 weeks and 1 day gestation for preterm contractions. The pregnancy was complicated by dichorionic-diamniotic (di-di) twin gestation. She had been on Triumeq (abacavir/dolutegravir/lamivudine) starting the 18<sup>th</sup> week of gestation, achieving an undetectable viral load and a CD4 count of 845 cells/µL at delivery. Prior to starting Triumeq, she had not been anemic, but after starting the ART, her hemoglobin progressively dropped throughout the rest of her pregnancy. Three days before delivery, her hemoglobin was 9.5 g/dL.

**Delivery:** Twins were delivered via cesarean section at 35w2d due to preterm labor. On Apgar scores were 5 and 8 at 1 and 5 minutes, respectively, for both neonates. Both required continuous positive airway pressure (CPAP) and oxygen due to respiratory distress.

# Neonatal Course

- Initial Findings: Both neonates were found to have profound metabolic acidosis and anemia with macrocytic red blood cells. Hematologic analysis revealed macrocytic anemia with nucleated red blood cells and monocytosis [4].
- Management: The twins were started on oral zidovudine

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(AZT) within the first 6 hours of life as per HIV-exposed infant protocols. Twin A's hemoglobin at birth was 12.5 g/ dL and Twin B's was 12.4 g/dL. Within two days, Twin A's hemoglobin dropped to 10.8 g/dL, necessitating a blood transfusion. Within four days, Twin B's hemoglobin dropped to 10.1 g/dL, also requiring a blood transfusion.Weekly complete blood counts (CBCs) showed gradual improvement by the end of the AZT course [1].

• **Discharge:** The twins were discharged in stable condition after 4 weeks of NICU care, with resolving anemia and no detectable HIV viral load.

# Discussion

**ART and Vertical Transmission:** Maternal ART has revolutionized perinatal HIV care, reducing vertical transmission rates to <2% when the maternal viral load is controlled [5]. In this case, Triumeq effectively suppressed maternal viremia but was associated with neonatal anemia, raising questions about its hematologic safety in utero.

#### Potential Etiology of Anemia

Although the mother had anemia during her pregnancy, the twins' hemoglobin levels at birth, while lower than normal, were not low enough to have been caused by the mother's anemia. Macrocytic anemia observed in the neonates aligns with known hematologic side effects of nucleoside reverse transcriptase inhibitors (NRTIs). While zidovudine is well-documented to cause megaloblastic anemia, data on abacavir and lamivudine are sparse. Dolutegravir, an integrase strand transfer inhibitor, is not typically associated with hematologic abnormalities [2]. In this case, placental transfer of these drugs likely disrupted erythropoiesis, leading to anemia.

Clinical Implications: This case underscores the importance of:

1. Monitoring neonatal hematologic parameters in pregnancies exposed to ART.

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**Case Report** 

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- 2. Considering alternative ART regimens in pregnant women when severe neonatal anemia is a concern.
- 3. Conducting further research to elucidate the mechanisms underlying ART-related macrocytosis and anemia [1].

# Conclusion

This case highlights a rare but significant adverse effect of maternal Triumeq use during pregnancy. Neonatal macrocytic anemia, though manageable, warrants close monitoring and timely intervention. Health professionals should weigh the benefits of ART in preventing vertical transmission against potential neonatal side effects, ensuring optimal maternal and neonatal outcomes (Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission, 2023).

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