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Case Report

# Neonate with Persistent Thrombocytopenia: Challenge in Treatment

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**Received:** June 14, 2023; **Published:** June 29, 2023

## Abstract

Thrombocytopenia is common hematological problem in neonates, but persistent low platelet count is rare. 8% of preterm and 6% of all neonates admitted to an NICU with severe thrombocytopenia and a common presenting problem hemorrhage which is difficult in management. A systematic workup will help in arriving at the proper diagnosis and providing accurate management in neonatal sepsis with refractory thrombocytopenia. We report a case of severe refractory thrombocytopenia in a low-birth-weight preterm baby who presented with early onset severe thrombocytopenia associated with repeated sepsis and required multiple platelet transfusions and antibiotics.

***Keywords:*** *Neonate; Thrombocytopenia; NICU*

## Introduction

Thrombocytopenia is common hematological problem in neonates, but persistent low platelet count is rare [1]. Neonatal thrombocytopenia defined as platelet count < 150 × $10^3$/μL in healthy newborn [2]. Depending on the time of onset, thrombocytopenia is classified into early onset (< 72 hours of age) and late onset (> 72 hours of age), further based on the platelet count it is classified into mild (< 150 × $10^3$ - 100 × $10^3$/μL), moderate (99 × $10^3$ - 50 × $10^3$/μL), and severe (< 50 × $10^3$/μL) [3]. 8% of preterm and 6% of all neonates admitted to an NICU with severe thrombocytopenia [4] and a common presenting problem hemorrhage which is difficult in management [2]. Early onset thrombocytopenia is usually secondary to placental insufficiency and reduced platelet production. After 72 hours of age, thrombocytopenia presents usually due to secondary to sepsis or necrotizing enterocolitis and thrombocytopenia is more severe and prolonged. Severe persistent thrombocytopenia is a very rare event in neonates [1]. Here we discuss a preterm baby with persistent thrombocytopenia with complications where we face difficulties in management.

## Case Report

A 7 day old baby girl, birth weight-2.3 kg was admitted in hospital with complaints of respiratory distress for 1 day and several episode of apnea with convulsion for 2 days. Baby born in a rural hospital by elective LUCS due to 34+ weeks of pregnancy with lower abdominal pain with rupture membrane for 2 hours. Mother (22 years, primi) had no medical illness during pregnancy. Baby had history of one epi-

sode convulsion for few seconds in 2nd day of life and discharged without any complication on 3rd day. On the 5th day at home, then baby again developed several episodes of convulsion with apnea and respiratory distress which was aggravating in time. When we received the baby, she was icteric, hypothermic, cyanosed with prolong CRT and no self-respiration, H/R: 180 b/min, $SpO_2$-70% and hypertonic limbs. Immediately the baby was put on mechanical ventilation, PCV mode, with IV fluid, antibiotics (meropenem, colomycin), antifungal, inotropes, anticonvulsant, inj vit k through umbilical catheter as per institutional protocol. Regarding CBC Hb-19 gm/dl, Hct-52.9%, WBC-22000/µL, Platelet: 20000/µL, CRP-24 mg/dl, ABG-compensated metabolic acidosis ($PCO_2$-16.9 torr and $HCO_3$-11.1 mmol/l), hyponatremia (131 mmol/l), hypoglycemia (1.2 mmol/l) with low albumin level (2.0 g/l).

Acinetobacter was found in both Blood C/S and tracheal aspiration which was sensitive to colomycin, polymyxin B and cotrimoxazole. Baby treated with sodium containing fluid, inj Pentaglobulin, inj albutin. At day 7 of admission, eye rolling movement, ecchymosis and purpura seen and also blood stain secretion on NP-OP suction and treated with platelet and whole blood infusion. Next day self-respiration appeared, CRP decreased but platelet count was still 20000/µL. After 2 days, baby's condition was stable, extubation done and feed was started through Ng with 5 L/min $O_2$ support and platelet count 64000/ µL. On 13th day of admission, baby was reddish pink, icteric, mildly oedematous, some ecchymosis was present, R/R 64 breaths/ min, H/R 132 beats/min, abdomen-soft, nondistended, Bowel/Bladder - normal, $Spo_2$ 94 - 98% in air, breast feeding trial given. From day 17, baby's condition gradually deteriorated, looked icteric, edematous, Reflex-activity poor, CRT < 3 sec. R/R- > 60 breaths/min, irregular, dyspnoeic, mild grunting, moderate air entry with crepitation both lungs, H/R-180 beats/min, abdomen soft but distended, hepatomegaly and ascites present, fresh blood from nose and mouth during suction and $SpO_2$- < 90%. Regarding investigations platelet count was again 15000/µL, serum albumin 2.8g/l, serum bilirubin 20.1 mg/dl (in direct 14.48 mg/dl) and blood C/S-*Klebsiella*, throat swab C/S-*Pseudomonas aeruginosa* was found. Baby kept on NPO, $O_2$ inhalation, fluid restricted to 130 ml/kg/day, whole blood and platelet transfusion, inj pentaglobin for 5 days, antibiotics changed to tigecycline, metronidazole and vancomycin according to culture sensitivity reports, phototherapy started, nebulization was done with colomycin and multivitamin and inj Vit K was given. On the 22nd of admission, baby's condition was improved, edema subsided, vitals were normal and no further bleeding manifestation. During hospital stay, USG of Brain was done and showed dilated lateral and 3rd ventricles with intraventricular hemorrhage (grade 2) in both ventricles and regarding echocardiography, small secundum ASD (3.5 mm) with mildly dilated right RA and RV with good biventricular function. On 28 days of life, she was discharged with normal ROP screening and hearing test. At 3 months and 9 months of age she again admitted in hospital for pneumonia. Regarding developmental follow up she is now 13 months old and presented with motor developmental delay (cannot sit yet and hold any object) but move head to sound and vocalization like two or three bi-syllable word.

## Discussion

In newborns and infants, the normal range for platelet count is $150 \times 10^3$ to $450 \times 10^3$/µL. Some data suggest a slightly lower limit of normal range in preterm infants [1] over the first few days after birth platelet counts decline but then begin to rise by 1 week of life [5].

Neonatal thrombocytopenia is a common hematological problem in neonatal intensive care unit (NICU) and the prevalence has been reported as 22% to 35%. The preterm and ELBW infants are more affected than term neonates [3,6,7]. The baby girl was preterm 34+ week gestational age has no significant maternal complications but was suffering from neonatal sepsis by several organisms with repeated thrombocytopenia.

In very premature infant or term sick baby, thrombocytopenia is most commonly occurred due to sepsis, followed by necrotizing enterocolitis (NEC), birth asphyxia, chronic intra-uterine hypoxia, TORCH (toxoplasmosis, other agents, rubella, cytomegalovirus, and herpes simplex) infections, or disseminated intravascular coagulation. Additionally, use of certain antibiotics and other medications can lead to thrombocytopenia which starts beyond the first few days of life [5]. Our patient had only evidence of sepsis, TORCH screening and

evidence of DIC is not proven by investigation reports. Sepsis is the most common cause for late onset severe thrombocytopenia in preterm neonates. Increased platelet consumption is due to DIC and decreased production due to bone marrow suppression [7-9].

After the first 72 hours of life, thrombocytopenia develops particularly due to bacterial infection or necrotizing enterocolitis (NEC) [10]. Many clinicians will obtain blood cultures and consider treating with antibiotics to cover for occult infection if the etiology for thrombocytopenia is not apparent [5]. At first, we also follow the institutional protocol for antibiotic coverage and then switch to culture sensitivity reports.

Placental insufficiency usually produces only mild to moderate thrombocytopenia ($50 \times 10^3$ to $150 \times 10^3/\mu L$) which spontaneously within 7 to 10 days after birth. Supportive Clinical features of this diagnosis include small for gestational age, intrauterine growth restriction, or maternal problems like hypertension, diabetes, or preeclampsia [10]. Mother of a newborn who is known case of idiopathic thrombocytopenic purpura, systemic lupus erythematosus, or other autoimmune disease should be screened for thrombocytopenia at birth, regardless of maternal platelet count at delivery because maternal autoantibodies are cleared from the baby's circulation and platelet levels is eventually normalize at age 10 to 60 days of life [5].

Severe thrombocytopenia ($< 50 \times 10^3/\mu L$) in NICU is seen most commonly in preterm and sick neonates, can be associated with significant underlying causes and morbidity [6,7]. The most feared bleeding complication in the newborn is intracranial hemorrhage (ICH), increase the risk of death and adverse neurologic outcomes [5]. The baby girl was suffering from ICH, grade 2 at birth and later developed delayed milestone of development with some of morbidly.

## Conclusion

Refractory thrombocytopenia is very rare in neonates. The early onset, severity, prolonged bleeding manifestation, the need for frequent platelet transfusions should raise suspicion and mandate evaluation for the etiology for thrombocytopenia like sepsis with multiple organisms.

## Acknowledgement

We are very grateful to parents of the neonate for cooperation and support by giving adequate information. Our sincere appreciation goes to Prof. (Dr) Helena Begum, head of Pediatrics department, Central International Medical College hospital for providing us with the required facilities. We also thank all the medical laboratory scientists and physicians working in this facility for their technical assistance and cooperation.

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**Volume 12 Issue 7 July 2023**