Joslyn P, et al., J Neonatol Clin Pediatr 2024, 11: 126
DOI: 10.24966/NCP-878X/100126

HSOA Journal of Neonatology and Clinical Pediatrics

Short Commentary

The effect of gestational age on the initial neonatal platelet count

Peter Joslyn[1]*, Zhide Fang[2] and Brian Barkemeyer[1]

[1]Department of Pediatrics, Division of Neonatology, Louisiana State University Health New Orleans, USA

[2]Biostatistics Program, School of Public Health, Louisiana State University Health New Orleans, USA

Introduction

Thrombocytopenia in the Neonatal Intensive Care Unit (NICU) is common, usually occurring in the first three days of life [1]. This presentation is referred to as early-onset thrombocytopenia. Causes of early-onset thrombocytopenia include growth restriction, aneuploidy, sepsis, congenital infection, and immune-mediated processes such as fetal and neonatal alloimmune thrombocytopenia (FNAIT) [2].

Our previous research investigated the relationship between maternal hypertension and early-onset neonatal thrombocytopenia [3]. We found that maternal hypertension did not increase the risk of neonatal thrombocytopenia on the first day of life. In that manuscript, we did not measure the effect of gestational age on the neonatal platelet count, which other authors have associated with neonatal thrombocytopenia [4–6]. Here, we aim to investigate the impact of gestational age on the initial platelet count and risk of thrombocytopenia using our original cohort of patients.

This study utilized the cohort of infants from our previous work [3]. That study was a retrospective cohort study performed at a single level III NICU over a 30-month period. Infants were eligible for inclusion in the original study if they had a complete blood count (CBC) obtained in the first 24 hours of life and did not have a condition classically associated with early-onset thrombocytopenia (such as infection or birth asphyxia). The study only considered an infant's initial platelet count. The electronic medical record was used to obtain clinical and demographic data on mother-infant dyads.

The variables of interest for this project included gestational age, presence of maternal preeclampsia with severe features (as defined by the American College of Obstetricians and Gynecologists [7]), infant sex, infant race, mode of delivery, prolonged rupture of membranes (>18 hrs), maternal fever (intrapartum temperature >100.4 F), and small for gestational age status (birthweight for gestational age <10% using the Fenton Preterm Growth Chart). Thrombocytopenia was defined as an initial platelet count <150,000/μL. All statistical analyses were performed using SAS 9.4 for Windows (SAS Institute Inc., Cary, North Carolina, USA). Multivariable negative binomial regression (NBR) was used to model the effect of different variables on the initial platelet count. Multivariable logistic regression assessed potential risk factors of an initial platelet count <150,000/μL.

Our cohort included 224 infants born to mothers with preeclampsia with severe features and an equal number of infants born to normotensive mothers matched for gestational age (plus or minus one week). Seventy-four of the 448 study participants (17%) had an initial platelet count <150,000/μL. The mean gestational age of study participants was 34 weeks, with a mean birthweight of 2112 g. The mode of delivery was a cesarian section in 265 infants (59%).

Multivariable NBR showed that gestational age has a statistically significant positive effect on the initial platelet count (p=0.002). Our results demonstrated the initial platelet count increased by 9% with every five-week increase in gestational age (count ratio=1.09, 95% confidence interval (CI) (1.03, 1.15)). Multivariable NBR also showed vaginal delivery (p=0.004) and prolonged rupture of membranes (p=0.01) were associated with a higher initial platelet count. Logistic regression showed that gestational age has a statistically significant positive effect on the risk of an initial platelet count <150,000/μL (p=0.013). Our model predicts with every five-week increase in gestational age, we expect to see a 43% decrease in the odds of thrombocytopenia (odds ratio (OR) 0.57, 95% CI (0.37, 0.89)). The odds of thrombocytopenia were positively affected by cesarian delivery (p=0.045) and SGA status (p=0.02). That is, thrombocytopenia was more likely in the setting of cesarian delivery and SGA status.

Our data suggests that gestational age statistically significantly impacts an infant's first platelet count and risk of thrombocytopenia positively (i.e., more mature infants are expected to have higher initial platelet counts and lower odds of early thrombocytopenia). This finding corroborates other authors' conclusions [4–6].

Our results have meaningful, practical implications. Namely, neonatal providers should expect a lower initial platelet count and a higher likelihood of thrombocytopenia in the least mature infants. This is an important consideration, as thrombocytopenia can be a sign of congenital or early-onset infection [2]. A short course of antibiotics may be warranted in thrombocytopenic infants, especially those born extremely prematurely; however, a low platelet count should not be the sole justification for prolonged antibiotic treatment since some degree of thrombocytopenia is common in this population. Additionally, neonatal providers should be judicious when treating premature infants with antibiotics, as antibiotic exposure early in life has been associated with later adverse outcomes [8,9]. An important caveat to this consideration is when the platelet count is <50,000/μL

***Corresponding author:** Peter Joslyn, 1Department of Pediatrics, Division of Neonatology, Louisiana State University Health New Orleans, USA. Tel: (504) 896-2723, Email address: pjosly@lsuhsc.edu

Citation: Joslyn P, Fang Z, Barkemeyer B (2024) The effect of gestational age on the initial neonatal platelet count. J Neonatol Clin Pediatr 11: 126.

Received: May 04, 2024; **Accepted:** May 15, 2024; **Published:** May 22, 2024

Copyright: © 2024 Joslyn P, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

(severe thrombocytopenia). In our cohort, only one infant (<1%) had severe thrombocytopenia. If severe thrombocytopenia is present, it is less likely to be related to prematurity alone, and other etiologies should be investigated.

Acknowledgment

We thank Andrew Chapple, Cornelius Rosenbaum, Maria Velez, and Asha Heard, who contributed to our previous work on early neonatal thrombocytopenia. We have no conflicts of interest to disclose.

References

1. Sola-Visner M, Saxonhouse MA, Brown RE (2008) Neonatal thrombocytopenia: What we do and don't know. Early Hum Dev 84: 499-506.

2. Letterio J (2020) Hematologic and Oncologic Problems in the Fetus and Neonate. In: Richard J Martin, Avroy A Fanaroff, Michele C Walsh (eds.). Fanaroff and Martin's Neonatal-Perinatal Medicine. (11th edn), Elsevier Philadelphia, PA.

3. Joslyn P, Rosenbaum C, Chapple AG, Heard A, Velez M, et al. (2022) The effects of maternal hypertension on the early neonatal platelet count. J Perinatol 42: 796-802.

4. Christensen RD, Baer VL, Henry E, Snow GL, Butler A, et al. (2015) Thrombocytopenia in Small-for-Gestational-Age Infants. Pediatrics 136: 361-370.

5. Christensen RD, Henry E, Wiedmeier SE, Stoddard RA, Sola-Visner MC, et al. (2006) Thrombocytopenia among extremely low birth weight neonates: data from a multihospital healthcare system. J Perinatol 26: 348-53.

6. Beiner ME, Simchen MJ, Sivan E, Chetrit A, Kuint J, et al. (2003) Risk Factors for Neonatal Thrombocytopenia in Preterm Infants. Am J Perinatol 20: 49-54.

7. American College of Obstetricians and Gynecologists (2020) Gestational Hypertension and Preeclampsia. ACOG Practice Bulletin No. 222. Obstet Gynecol 135: 237-260.

8. Kuppala VS, Meinzen-Derr J, Morrow AL, Schibler KR (2011) Prolonged Initial Empirical Antibiotic Treatment is Associated with Adverse Outcomes in Premature Infants. J Pediatr 159: 720-725.

9. Cantey JB, Pyle AK, Wozniak PS, Hynan LS, Sánchez PJ (2018) Early Antibiotic Exposure and Adverse Outcomes in Preterm, Very Low Birth Weight Infants. J Pediatr 203: 62-67.

HERALD

Advances In Industrial Biotechnology | ISSN: 2639-5665

Advances In Microbiology Research | ISSN: 2689-694X

Archives Of Surgery And Surgical Education | ISSN: 2689-3126

Archives Of Urology

Archives Of Zoological Studies | ISSN: 2640-7779

Current Trends Medical And Biological Engineering

International Journal Of Case Reports And Therapeutic Studies | ISSN: 2689-310X

Journal Of Addiction & Addictive Disorders | ISSN: 2578-7276

Journal Of Agronomy & Agricultural Science | ISSN: 2689-8292

Journal Of AIDS Clinical Research & STDs | ISSN: 2572-7370

Journal Of Alcoholism Drug Abuse & Substance Dependence | ISSN: 2572-9594

Journal Of Allergy Disorders & Therapy | ISSN: 2470-749X

Journal Of Alternative Complementary & Integrative Medicine | ISSN: 2470-7562

Journal Of Alzheimers & Neurodegenerative Diseases | ISSN: 2572-9608

Journal Of Anesthesia & Clinical Care | ISSN: 2378-8879

Journal Of Angiology & Vascular Surgery | ISSN: 2572-7397

Journal Of Animal Research & Veterinary Science | ISSN: 2639-3751

Journal Of Aquaculture & Fisheries | ISSN: 2576-5523

Journal Of Atmospheric & Earth Sciences | ISSN: 2689-8780

Journal Of Biotech Research & Biochemistry

Journal Of Brain & Neuroscience Research

Journal Of Cancer Biology & Treatment | ISSN: 2470-7546

Journal Of Cardiology Study & Research | ISSN: 2640-768X

Journal Of Cell Biology & Cell Metabolism | ISSN: 2381-1943

Journal Of Clinical Dermatology & Therapy | ISSN: 2378-8771

Journal Of Clinical Immunology & Immunotherapy | ISSN: 2378-8844

Journal Of Clinical Studies & Medical Case Reports | ISSN: 2378-8801

Journal Of Community Medicine & Public Health Care | ISSN: 2381-1978

Journal Of Cytology & Tissue Biology | ISSN: 2378-9107

Journal Of Dairy Research & Technology | ISSN: 2688-9315

Journal Of Dentistry Oral Health & Cosmesis | ISSN: 2473-6783

Journal Of Diabetes & Metabolic Disorders | ISSN: 2381-201X

Journal Of Emergency Medicine Trauma & Surgical Care | ISSN: 2378-8798

Journal Of Environmental Science Current Research | ISSN: 2643-5020

Journal Of Food Science & Nutrition | ISSN: 2470-1076

Journal Of Forensic Legal & Investigative Sciences | ISSN: 2473-733X

Journal Of Gastroenterology & Hepatology Research | ISSN: 2574-2566

Journal Of Genetics & Genomic Sciences | ISSN: 2574-2485

Journal Of Gerontology & Geriatric Medicine | ISSN: 2381-8662

Journal Of Hematology Blood Transfusion & Disorders | ISSN: 2572-2999

Journal Of Hospice & Palliative Medical Care

Journal Of Human Endocrinology | ISSN: 2572-9640

Journal Of Infectious & Non Infectious Diseases | ISSN: 2381-8654

Journal Of Internal Medicine & Primary Healthcare | ISSN: 2574-2493

Journal Of Light & Laser Current Trends

Journal Of Medicine Study & Research | ISSN: 2639-5657

Journal Of Modern Chemical Sciences

Journal Of Nanotechnology Nanomedicine & Nanobiotechnology | ISSN: 2381-2044

Journal Of Neonatology & Clinical Pediatrics | ISSN: 2378-878X

Journal Of Nephrology & Renal Therapy | ISSN: 2473-7313

Journal Of Non Invasive Vascular Investigation | ISSN: 2572-7400

Journal Of Nuclear Medicine Radiology & Radiation Therapy | ISSN: 2572-7419

Journal Of Obesity & Weight Loss | ISSN: 2473-7372

Journal Of Ophthalmology & Clinical Research | ISSN: 2378-8887

Journal Of Orthopedic Research & Physiotherapy | ISSN: 2381-2052

Journal Of Otolaryngology Head & Neck Surgery | ISSN: 2573-010X

Journal Of Pathology Clinical & Medical Research

Journal Of Pharmacology Pharmaceutics & Pharmacovigilance | ISSN: 2639-5649

Journal Of Physical Medicine Rehabilitation & Disabilities | ISSN: 2381-8670

Journal Of Plant Science Current Research | ISSN: 2639-3743

Journal Of Practical & Professional Nursing | ISSN: 2639-5681

Journal Of Protein Research & Bioinformatics

Journal Of Psychiatry Depression & Anxiety | ISSN: 2573-0150

Journal Of Pulmonary Medicine & Respiratory Research | ISSN: 2573-0177

Journal Of Reproductive Medicine Gynaecology & Obstetrics | ISSN: 2574-2574

Journal Of Stem Cells Research Development & Therapy | ISSN: 2381-2060

Journal Of Surgery Current Trends & Innovations | ISSN: 2578-7284

Journal Of Toxicology Current Research | ISSN: 2639-3735

Journal Of Translational Science And Research

Journal Of Vaccines Research & Vaccination | ISSN: 2573-0193

Journal Of Virology & Antivirals

Sports Medicine And Injury Care Journal | ISSN: 2689-8829

Trends In Anatomy & Physiology | ISSN: 2640-7752

Submit Your Manuscript: https://www.heraldopenaccess.us/submit-manuscript