



PREVALENCE AND OUTCOME OF THROMBOCYTOPENIA AND ITS CORRELATION WITH CRP IN NEONATAL INTENSIVE CARE UNIT

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ABSTRACT

Introduction: Neonatal thrombocytopenia, one of the most common hematological abnormalities in neonates particularly in premature and sick neonates. The aim of this study to study the prevalence and outcome of Thrombocytopenia and its correlation with CRP in the neonatal intensive care unit.

Objectives:

1. To find the prevalence of Thrombocytopenia in the Neonatal intensive care unit in King George Hospital.
2. Factors that predisposing to Thrombocytopenia in neonates
3. Outcomes of thrombocytopenia in neonates.
4. Correlation of thrombocytopenia with the C-reactive protein (CRP) in neonates.

Materials And Methods:

It is a cross-sectional study in 80 Newborns less than or equal to 28 days admitted in NICU, King George hospital, Visakhapatnam from JANUARY 2019 to JUNE 2020 over period of 18 months. Data is collected from the medical records.

Results:

The prevalence of thrombocytopenia in this study is 40% with early-onset thrombocytopenia being 65% whereas, that of late-onset thrombocytopenia is 35%, strong association is found between thrombocytopenia and sepsis, with mild to moderate variety being (86.4%) and (40%) of severe thrombocytopenia group. Of 80 newborns, 90% of severely thrombocytopenic group have positive CRP, whereas it is 40.9% in the mild to moderate group and 1.4% in normal group. 40% of severe thrombocytopenic group had elevated PT, APTT, INR. There was higher proportion of bleeding (45.5%) in severe thrombocytopenia group. gastrointestinal bleeding constituted for 36.4% and intracranial bleeding 2.1%.

Conclusion:

Positive septic workup is significantly associated with thrombocytopenia, CRP was significantly associated with thrombocytopenia in this study.

KEYWORDS : Neonatal thrombocytopenia, C - reactive protein, bleeding manifestations

BACKGROUND AND INTRODUCTION

Normal Platelet count in newborns is similar to that of adults ranging from 150-450,000/mm³. A considerable number of studies have shown that the average fetal platelet count is above 150,000/μL by 2nd trimester of pregnancy and then it remains fairly constant thereafter.

Neonatal thrombocytopenia, one of the most common hematological abnormalities in neonates particularly in premature and sick¹. It is defined as a platelet count is less than 150,000/mm³ irrespective of gestational age² and is classified based on severity² into

Mild - 1,00,000/mm³ to 1,50,000/mm³
 Moderate - 50,000/mm³ to 1,00,000/mm³
 Severe - less than 50,000/mm³

Also classified into early and late onset thrombocytopenia based on time of onset that is within 72 hours of life and after 72 hours of life respectively.

There are only 3 mechanisms responsible for thrombocytopenia⁴,

➤ Decreased platelet production -intrauterine insult (probably hypoxic), IUGR, PIH, Trisomy of chromosome 13, 18, or 21 and Turner syndrome⁵, Fanconi's anemia Bernard-Soulier syndrome

➤ Increased platelet destruction

➤ Platelet sequestration (mostly secondary to hypersplenism) - immunologically mediated maternal platelet Allo and auto antibodies², SEPSIS, DIC, NEC, Hemangiomas (Kassabach-Merritt syndrome), indwelling umbilical catheter.

➤ A combination of these

Some of the drugs either given to mother or neonate known to cause thrombocytopenia includes -Quinine, Quinidine, Sulfonamides, Thiazid diuretics, Magnesium sulfate, Tolbutamide, Hydralazine, Indomethacin, Heparin, Glucagon infusion, Vancomycin, Phenytoin... Of which the most common neonatal factors include prematurity, low

birth weight, necrotizing enterocolitis, sepsis^{3, 4}, maternal factors generally associated are premature rupture of membranes, pre-eclampsia, antepartum hemorrhage, maternal thrombocytopenia and other chronic illnesses.

Thrombocytopenic neonates are at greater risk for bleeding. No relationship between the degree of thrombocytopenia to clinical features was detected. Significantly more thrombocytopenic babies (22% vs 3%) had skin, renal, pulmonary, or CNS hemorrhage compared to non thrombocytopenic neonates⁶. Andrew et al reported that the incidence of IVH in thrombocytopenic VLBW neonates was 78% compared with 48% in non-thrombocytopenic neonates (p < 0.01)⁷.

CRP

CRP, the most commonly used rapid diagnostic test in neonatal sepsis. It directly reflects the intensity of the pathological process stimulating CRP production and shows no diurnal variation. It is an exquisitely sensitive systemic marker of inflammation and tissue damage.

OBJECTIVES

1. To find the prevalence of Thrombocytopenia in the Neonatal intensive care unit in King George Hospital.
2. Factors that predisposing to Thrombocytopenia in neonates
3. Outcomes of thrombocytopenia in neonates.
4. Correlation of thrombocytopenia with the C-reactive protein (CRP) in neonates.

METHODOLOGY

Study Design - cross-sectional descriptive study.

Study Population - 80 neonates, less than or equal to 28 days admitted to NICU, King George hospital, Visakhapatnam.

Duration Of Study - from JANUARY 2019 to JUNE 2020 for a period of 18 months.

Inclusion Criteria:

Neonates less than or equal to 28 days admitted in NICU.

Exclusion Criteria:

- Failure to obtain consent from parents for participation
- neonates with life-threatening malformations

Method Of Collection Of Data:

At admission, the parents and guardian were informed about the study and written and oral informed consent was obtained from medical records.

RESULTS

Out of 80, 32 neonates have thrombocytopenia accounts for 40% prevalence rate. The prevalence of severe thrombocytopenia on the whole is 12.5%. Of all the neonates with thrombocytopenia 68.7% had mild to moderate thrombocytopenia and 31.3% had severe thrombocytopenia. In our study, Late-onset thrombocytopenia is common in severely thrombocytopenic neonates (90%) and mild to moderate thrombocytopenia is common in early -onset thrombocytopenia (59.1%).

There is high incidence of bleeding in severely thrombocytopenic group (45.5%). when compared to 13.6% in mild to moderate and 2.2% in no thrombocytopenia neonates .high incidence of intracranial bleeding (2.1%) and gastrointestinal bleeding in severely thrombocytopenic group (36.4%).

The prevalence of septicemia is 80% in severely thrombocytopenia group it is 77.7% and 31.3% in the mild to moderate and no thrombocytopenia group respectively.

There is incidence of 90% cases in severe group with CRP positivity as compared to 40.9% in mild to moderate group and only 10.4% in normal group. 40%, severely thrombocytopenic group had elevated PT, APTT, INR 20% of severely thrombocytopenic group found with E.coli positive sepsis, 10% with klebsiella positive sepsi and 10% with pseudomonas positive sepsis. 60%, severely thrombocytopenic group had received platelet transfusions.

The mortality is 40% in severe group when compared to no mortality in mild to moderate and no thrombocytopenia group.

Table: 1 Onset Of Thrombocytopenia

		Thrombocytopenia Mild to moderate	Thrombocytopenia Severe	Total	On the whole
Onset of thrombocytopenia	Early onset	13/32 (59%)	1/32 (10%)	14/32 (44%)	14/80 (17.5%)
	Late onset	9/32 (40%)	9/32 (90%)	18/32(56%)	18/80(22.5%)
Total		22/32 (69%)	10/32 (31%)	32/32 (100%)	32/80 (40%)
On the whole		22/80 (27.5%)	10/80 (12.5%)	32/80 (40%)	

DISCUSSION

It is a common hematological abnormality encountered in the NICU, the etiology and predisposing factors are many and complex, severe thrombocytopenia is with poor outcomes.

It is found that prevalence of thrombocytopenia is high (40%) and that of severe thrombocytopenia is 31.3% and sepsis being the major etiology associated with mild to moderate thrombocytopenia whereas, sepsis with DIC in severe thrombocytopenia.

- ❖ Maternal PIH, NEC, perinatal asphyxia is not associated with neonatal thrombocytopenia in this study.
- ❖ Positive septic workup is significantly associated with thrombocytopenia.
- ❖ Gastrointestinal bleeding and intracranial bleeding are significantly associated with severe thrombocytopenia.
- ❖ Mortality rate is common in severe thrombocytopenia group in this study.
- ❖ CRP is significantly associated with thrombocytopenia in this study. Hence it can be concluded that thrombocytopenia is very much common in NICU admissions with septicemia as its most important

and most common cause. neonates with severe thrombocytopenia bleed more frequently Poor outcome is associated with severe Thrombocytopenia. Beiner et al.⁶ estimated the prevalence of thrombocytopenia, only among preterm Neonates to be 31%. The prevalence in Zaccheaus A Jeremiah at al⁹ is 53%, higher than the prevalence obtained in this study. Gupta et al⁵ demonstrated overall prevalence of 70.5%. Shashikala et al have 63.8% which is far higher than the prevalence in our study. Rabindran et al. demonstrated 24.7% which is less than this study.

Zaccheaus et al⁹ demonstrates a overall prevalence of 53% of which 84.84% with early onset thrombocytopenia which is far more higher than that of our present study. Khalessi et al, Eslami et al, Amutha et al. also demonstrated a prevalence of early onset thrombocytopenia as 67.7%, 75.3%, 87.9% respectively. The overall mortality in thrombocytopenia group is 12.5% and the mortality is significantly high in severely thrombocytopenic group that is 40% when compared to no mortality in mild to moderate and no thrombocytopenia group. There is statistically significant association between mortality and severe thrombocytopenia in this study. 60% of severely thrombocytopenic group was discharged compared to 100% in mild to moderate and no thrombocytopenia group. This mortality rate is similar to that obtained in Elisabeth et al¹⁰ study where as it is less than that by Meena SL et al¹¹ with determined mortality rate of 34%.

Elisabeth Resch et al¹⁰. study determined a mortality of 10.8%.

CONCLUSIONS:

It was found that prevalence of Thrombocytopenia was high (40%) and that of severe thrombocytopenia was 31.3%. sepsis was the major etiology associated with mild to moderate thrombocytopenia whereas, sepsis with DIC in severe thrombocytopenia. Maternal PIH, NEC, perinatal asphyxia was not associated with neonatal thrombocytopenia in this study.

Positive septic workup is significantly associated with thrombocytopenia.

Gastrointestinal bleeding and intracranial bleeding were significantly associated with severe thrombocytopenia.

Mortality rate was common in severe thrombocytopenia group.

CRP was significantly associated with thrombocytopenia in this study. Hence it can be concluded that thrombocytopenia is very much common in NICU admissions. Septicemia is its most important and most common cause. Severe thrombocytopenia neonates bleed more frequently. Poor outcome is associated with severe Thrombocytopenia.

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