

OUTCOME OF NEONATES WITH THROMBOCYTOPENIASharangouda Patil¹, Roopa Mangshetty², Basavaraj Patil³**HOW TO CITE THIS ARTICLE:**

Sharangouda Patil, Roopa Mangshetty, Basavaraj Patil. "Outcome of Neonates with Thrombocytopenia". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 17, April 28; Page: 4533-4538, DOI: 10.14260/jemds/2014/2471

ABSTRACT: OBJECTIVE: To determine etiology, onset, clinical features and outcome of neonates with thrombocytopenia. **METHODS:** 140 neonates having bleeding or having platelet count (<1.5lakhs/ μ l) were selected from those admitted to NICU'S attached to MR Medical College, Gulbarga. Initial platelet count was done on admission and counts were repeated 12 hours after any therapeutic intervention. **OBSERVATION AND RESULTS:** Severe thrombocytopenia (<50000/ μ l) was present in 8.5%, moderate (50, 000-1, 00, 000/ μ l) in 17%. Majority (45.33%) were preterm and the major cause was sepsis in 51.3%. Mucosal bleed was the most common presentation. Mortality was 37% in severe and 3.9% in moderate thrombocytopenia group. **CONCLUSION:** Significant association is observed with maternal PIH, Late onset sepsis, NEC and sepsis with DIC. Prematurity, IUGR, Birth asphyxia were common associated morbidities. Severe thrombocytopenia in sick neonates, in NICU, is a poor prognostic indicator.

KEYWORDS: Thrombocytopenia, septicemia, neonatal intensive care unit.

INTRODUCTION: Thrombocytopenia (platelet count (<1.5lakhs/ μ l) is one of the most common haematological problems in NICU with 18-35% of neonates developing this problem.¹ The overall prevalence of thrombocytopenia in neonates ranges from 1 to 5%²⁻⁶ and is reported to be much higher in neonates admitted to neonatal intensive care units, ranging from 22 to 35%.²⁻⁶ More common among extremely low birth weight, preterm babies or sick neonates. In contrast, only 2% of the neonates are thrombocytopenic at birth with Severe Thrombocytopenia (platelet count <50, 000/ μ l) occurring in less than 3/1000 term infants.⁷

In the past decade there have been a lot of research article pouring in regarding the etiology, clinical profile and management of this entity, Neonatal Thrombocytopenia in the NICU's.^{7,8} The influence of thrombocytopenia on the outcome of neonate is a subject that has not been studied in detail in the past. Neither have articles assessed the value of neonatal thrombocytopenia as a prognostic indicator in sick neonates. After a detailed search of the indexed medical literature, it was found that there have been only few articles on this topic from India.^{9,10}

One article is a study of the association between maternal PIH and neonatal thrombocytopenia while the others are case reports and case series reports. The paucity of studies from India and the increasing prevalence of this condition in our NICU, instigated us to determine the etiology, incidence, onset, clinical profile and immediate outcome of the neonates admitted to NICU's attached to M. R. Medical College, Gulbarga.

METHODS: 140 of 550 consecutive neonates admitted to NICU's attached to M. R. Medical College, Gulbarga during the period of one and half years irrespective of their underlying morbidity were taken up for the study. At admission, the parents or guardians were informed about the study. A detailed history inclusive of maternal history and obstetric history with a focus on history suggestive

ORIGINAL ARTICLE

of a bleeding and its type in the new born or the mother was obtained. A history of PIH, gestational diabetes mellitus, premature rupture of membrane, Rh isoimmunisation in the mother, any drug consumption was taken.

Every neonate was examined in detail for purpuric /petechial rashes, mucosal bleeding etc.

All neonates at admission underwent a gastric lavage to look for any altered blood in the aspirate. Maternal blood was differentiated from neonatal blood using the Apt-Downey test. All neonates underwent blood investigations like complete blood count, peripheral smear study, blood culture, sepsis work up (absolute neutrophil count, total WBC count, micro ESR, C reactive protein).

Relevant data was entered in a proforma and analyzed. Statistical analysis was done by chi square test, continuous variables were analyzed using unpaired two tailed student t test or by one way analysis of variance (ANOVA).

RESULTS: Of 550 consecutive neonatal admissions, subjects were divided into 3 groups based on their platelet counts:

- Prevalence of thrombocytopenia on the whole was 25.45% of which severe thrombocytopenia (<50, 000/ μ l) was 8.5%, mild to moderate thrombocytopenia (>50, 000/ μ l) was 17.01%.The mean platelet count for all the groups were 1.603Lakhs/ μ l.
- Among the various predisposing factors, maternal PIH was significantly associated with thrombocytopenia (p value <0.001)
- According to the age at presentation, severe thrombocytopenia was seen after 72 hours of life (p value 0.012) and it was significant.
- Septicaemia, as proven by blood culture, was significantly associated with thrombocytopenia. Prevalence of septicaemia was 60% in the severely thrombocytopenic group.34.40% and 25.12% in the mild to moderate and no thrombocytopenic group respectively.
- Mucosal bleeding was significantly associated with thrombocytopenia; prevalence was 65.95% in the severely thrombocytopenic group.
- The proportion of mortality was high in the severely thrombocytopenic group, but the proportion of babies with a not satisfactory immediate outcome was higher in mild to moderate thrombocytopenia and no thrombocytopenia group.

SUBJECT DISTRBUTION IN VARIOUS GROUPS:

Groups	Description	No. of subjects	Percentage of the total
Group I	No Thrombocytopenia (>150,000/ μ L)	410	74.54%
Group II	Thrombocytopenia (<150,000/ μ L)	140	25.45%
Group IIa	Mild to moderate Thrombocytopenia (50,00/ μ L- 150,000/ μ L)	93	17.01%
Group IIb	Severe Thrombocytopenia (<50,000/ μ L)	47	08.5%

ORIGINAL ARTICLE

MATERNAL PH AND THROMBOCYTOPENIA:

	Group I	% within group	Group IIa	% within group	Group IIb	% within group
H/O Maternal PIH present	79	19.44	26	27.95	34	72.34
No history of maternal PIH	331	80.55	67	72.04	13	27.65

AGE AT PRESENTATION IN HOURS IN DIFFERENT AGE GROUP:

	Group I	% within group	Group IIa	% within group	Group IIb	% within group
<72 hrs	321	78.29	68	73.11	21	44.68
>72 hrs	89	21.70	25	26.88	26	55.31

SEPTICEMIA AND THROMBOCYTOPENIA:

Septicemia	Group I (Non-thrombo)	% with group	Group IIa (moderate)	% within group	Group IIb (severe)	% within group
No	307	74.87	61	65.59	19	40.42
Yes	103	25.12	32	34.40	28	59.57

DISCUSSION: Neonatal thrombocytopenia is a common haematological abnormality encountered in the NICU². The etiology and predisposing factors are many and they interact in a complex manner to produce neonatal thrombocytopenia.

Prevalence: The prevalence of thrombocytopenia in our study was 25.45%. This prevalence is slightly higher than that, 08-35%, reported in other studies.⁸⁻¹⁰

ORIGINAL ARTICLE

Studies on neonatal thrombocytopenia in NICUs	Prevalence of thrombocytopenia
Castle et al ⁸	22%
Hale Oren et al ⁹	5.4%
Beiner et al ¹⁰	31%
Our study	25.45%

Beiner et al estimated the prevalence of thrombocytopenia only among preterm neonates¹⁰. It is evident from the table that in our study there is a slight higher prevalence of neonatal thrombocytopenia. This higher prevalence is probably due to higher proportion of septicemic neonates in our NICU admissions, 31.3%, while it was lower in the other studies, for e.g. in the study conducted by Castle et al the prevalence of septicemia was just 7.5%.⁸ The proportion of severe thrombocytopenia among the neonatal thrombocytopenias, 33.57% in our study, is also on the higher side. This is once again probably a reflection of a higher contribution of septicemia to neonatal thrombocytopenia in our NICU than other etiologies. Septicemia is reported to result in severe thrombocytopenia rather than its milder form in various studies.¹¹

Etiological Profile: The etiological profile on the whole was similar to other NICU studies from India, with septicemia and perinatal asphyxia accounting for the majority of the admissions.¹¹ Septicemia accounted for most of the cases in both the severe and mild to moderate thrombocytopenia group. Perinatal asphyxia accounted for most of the admissions in the no thrombocytopenia group. Septicemia with DIC accounted for 28% of the cases of severe thrombocytopenia.

Studies on neonatal thrombocytopenia in NICUs	Prevalence of septicaemia
Castle et al ⁸	10%
Hale oren et al ⁹	5.4%
Our study	28.17%

Predisposing Factors: Maternal PIH was significantly associated with neonatal thrombocytopenia ($P < 0.001$) and the odds ratio of the association was calculated to be 4.8 (with a C.I of 2.4-9.3). This finding is in agreement with studies conducted by Burrows et al.¹²

Studies on neonatal thrombocytopenia in NICUs	Prevalence of maternal PIH
Burrows et al ¹²	68.1%
Our study	72.17%

But maternal PIH is associated with mild to moderate thrombocytopenia rather than severe thrombocytopenia in other studies while in our study it was associated with severe thrombocytopenia. This could once again be explained by the frequent exposure of these neonates to

ORIGINAL ARTICLE

infection, due to the relatively high prevalence of septicemia in our study that leads to a precipitous fall in platelet count.

It was shown that 55.31% of the severely thrombocytopenic neonates presented after 72 hours of life while only 25% and 21.7 % of neonates did so in the other two groups. This finding once again reiterates the well documented association that majority of the severely thrombocytopenic neonates present after 72 hours and the common etiology, in these neonates, are acquired ones such as septicemia and NEC.^{13,14}

Studies on neonatal thrombocytopenia in NICUs	<72 hours		>72 hours	
	Moderate	Severe	Moderate	Severe
Castle et al ⁸	66.11%	47.01%	39.24%	52.23%
Rajeev mehta ¹⁵	13%	20%	36.2%	51%
Our study	73.11%	44.68%	26.88%	55.31%

Clinical Features: Mucosal bleeding was significantly associated with thrombocytopenia (P=0.002). While 50% of the severely thrombocytopenic neonates had mucosal bleeding only 15.7% and 19.6% of the other two groups bled. The types of bleeding included G.I bleed, bleed from the E.T. tube (pulmonary hemorrhage) and bleeding from the oral cavity.

Studies on neonatal thrombocytopenia in NICUs	Prevalence on mucosal bleeding
Beiner et al ¹⁰	82.33%
Mehtha et al ¹⁵	68.23%
Castle et al ⁸	70.11%
Our study	64.70%

Immediate Outcome: Mortality rate was very high, 37%, among the severely thrombocytopenic neonates while it was only 3.72% and 3.92% respectively in the mild to moderate and no thrombocytopenia groups. The proportion of a "Non- satisfactory" outcome was more (80.39%) in the mild to moderate thrombocytopenia group while it was 30 and 52.77% in the severely thrombocytopenia and no thrombocytopenia group. Hence a poor immediate outcome was associated with thrombocytopenia. This association might be due to the higher degree of severity of the underlying illness or due to an increased susceptibility of the neonates to complications, in the severely thrombocytopenic group.

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Date of Submission: 14/03/2014.

Date of Peer Review: 15/03/2014.

Date of Acceptance: 21/03/2014.

Date of Publishing: 24/04/2014.