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RESEARCH ARTICLE

NEONATATAL THROMBOCYTOPENIA AND ASSOCIATED FACTORS

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ABSTRACT:

Background: Thrombocytopenia is the most common hematological abnormality which is encountered in the neonatal intensive care unit (NICU). The incidence in neonates varies greatly, depending upon the population studies. According to the frequency of thrombocytopenia and its complications and because of lack of such research in India, this study was performed to determine etiology, onset, clinical features and outcome of neonates with thrombocytopenia on neonates admitted to Narayana superspeciality hospital NICU over a period of 3 years. **Material and methods:** A retrospective study was conducted over a period 3 years from jan 2012 – dec 2014.The medical records of all the babies admitted to NICU were reviewed. **Results:** A total of 294 babies were admitted in this 3 years,out of these prevalence of thrombocytopenia was 38.4%,Severe thrombocytopenia was present in 12.3%, moderate in 18.4% & majority were with mild thrombocytopenia 69.2%. Majority were preterm[67.3%].Mucosal bleed was the most common symptom[67.3%] and the major cause was sepsis in 50..7%.Major risk factor was maternal PIH [43%]. Mortality was 25% in severe,8.3% in moderate thrombocytopenia group. **Conclusion:** The prevalence of neonatal thrombocytopenia was 38.4%. Significant maternal risk factors that lead to thrombocytopenia was PIH, while risk factors of neonates were sepsis and prematurity & presence of severe thrombocytopenia in sick neonates is a poor prognostic indicator.

KEYWORDS: Thrombocytopenia, septicemia, neonatal intensive care unit.

INTRODUCTION

Thrombocytopenia (platelet count <1.5lakhs/µl) 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/µl) 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, prevalence, onset, clinical profile and immediate outcome of the neonates admitted to NICU

MATERIAL AND METHODS

This hospital based retrospective study was carried out in the Neonatal Intensive Care unit at Narayana superspeciality hospital ,Bangalore,Karnataka,India for a period of 3 years from jan 2012 – dec 2014 .The hospital ethical committee approved the study protocol. Approximately 750 deliveries are conducted per year .All the admitted neonates were enrolled on a structured protocol which included antenatal care, maternal morbidity, mode and place of delivery,age,gestational age ,clinical symptoms,diagnosis,platelet count and other relevant investigations, duration of the stay and outcome.Relevant data was entered in a proforma and analyzed.

Inclusion criteria;All the neonates who were admitted to the NICU.

Exclusion criteria;Babies who came in the NICU for a few hours observation and were shifted to mothers side.

RESULTS: Of 294 neonatal admissions,65 neonates had thrombocytopenia.They were divided into 3 groups based on their platelet counts:

SUBJECT DISTRBUTION IN VARIOUS GROUPS:

Groups	Description	No. of subjects	Percentage of the total
Group 1	Mild Thrombocytopenia[>100000-150000 / µl.	45	69.2%
Group 2	Moderate Thrombocytopenia[50000-100000 / µl.	12	18.4%
Group 3	Severe Thrombocytopenia[<50000 / µl.	08	12.3%

Prevalence of thrombocytopenia on the whole was 35.4%[65/294].

Group 3 with severe thrombocytopenia (<50, 000/µl) was 12.3%[8/65],group 2 with moderate thrombocytopenia (>50, 000-100000/ µl) was 18.4%[12/65] and group 1 with mild thrombocytopenia was 69.2%[45/65].The mean platelet count for all the groups were 1.58Lakhs/ µl.

MATERNAL PIH AND THROMBOCYTOPENIA:

Maternal PIH	Group 1	% within group	Group 2	% within group	Group 3	% within group
Present	14	19.7%	9	75%	5	62.5%
Absent	45	80.3%	12	25%	8	37.5%

Among the various predisposing factors, maternal PIH was significantly associated with thrombocytopenia in 43%[28/65] of the cases

AGE AT PRESENTATION IN HOURS IN DIFFERENT AGE GROUP:

	Group 1	% within group	Group 2	% within group	Group 3	% within group
< 72 hrs	35	77.7 %	8	66.6 %	7	87.5%
>72 hrs	10	22.2 %	4	33.3 %	1	12.5%

According to the age at presentation,majority were <72 hrs 76.9%[50/65] and 87.5% of severe thrombocytopenia was seen < 72 hours of life.

SEPTICEMIA AND THROMBOCYTOPENIA

Septcimia	Group 1	% within group	Group 1	% within group	Group 1	% within group
Absent	4	28.5%	6	54.5	1	12.5%
Present	10	71.4 %	5	45.4	7	87.5%

Septicaemia, as proven by blood culture, was significantly associated with thrombocytopenia. Prevalence of septicaemia was 50.7%[33/65]. Sepsis was seen in 87.5%[7/8],45.4%[5/11] and 71.4%[10/14] in the severe, moderate and mild thrombocytopenic group respectively.

CLINICAL FEATURES AND THROMBOCYTOPENIA

Clinical features	Group 1	% within group	Group 2	% within group	Group 3	% within group
Mucosal bleed	20	44.4%	8	66.6%	6	75%
Purpura/Petechiae	8	17.7%	3	25%	5	62.5%

Mucosal bleeding was significantly associated with thrombocytopenia; prevalence was 52.3%[34/65] 75.% in the severely thrombocytopenic group.

DEATH AND THROMBOCYTOPENIA

Death	Group 1	% within group	Group 2	% within group	Group 3	% within group
	0		1	8.3%	2	25%

The proportion of mortality was high in the severely thrombocytopenic group 25%[2/8]

DISCUSSION

Neonatal thrombocytopenia is a common haematological abnormality encountered in the NICU[2.]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 38.4%. This prevalence is slightly higher than that, 08-35%, reported in other studies.[8-10]

Studies on neonatal thrombocytopenia in NICUs	Prevalence of thrombocytopenia
Castle et al[8]	22 %
Hale oren et a[l9]	5.4 %
Beiner et al[10]	31 %
Present study	38.4%

Beiner et al estimated the prevalence of thrombocytopenia only among preterm neonates[10]. 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, 50.7%, 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, 50.7% 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 accounting for the majority of the admissions.[11] Septicemia accounted for 50.7% [33/65] of cases.Septicemia accounted for 87.5% of the cases of severe thrombocytopenia

Studies on neonatal thrombocytopenia in NICUs	Prevalence of septicemia
Castle et al[8]	10%
Hale oren et al[9]	5.4%
Present study	50.7%

Predisposing Factors: Maternal PIH was significantly associated with neonatal thrombocytopenia in 43% of the cases.

Studies on neonatal thrombocytopenia in NICUs	Prevalence of maternal PIH
Burrows et al[12]	68.1%
Present study	43%

But maternal PIH is associated with mild to moderate thrombocytopenia in other studies while in our study it was associated with moderate to severe thrombocytopenia. This could once again be explained by the frequent exposure of these neonates to infection, due to the relatively high prevalence of septicemia in our study that leads to a precipitous fall in platelet count.

Onset: It was shown that 87.5% of the severe and 66.6% of the moderate thrombocytopenic neonates presented before 72 hours of life.

Studies on neonatal thrombocytopenia in NICUs	< 72 hrs		>72 hrs	
	Moderate	Severe	Moderate	Severe
Castle et al[8]	66.1%	47.1%	39.2 %	52.2 %
Rajeev mehta[15]	13%	20 %	36.2 %	51 %
Present study	66.6%	87.5%	33.3%	12.5%

Clinical Features: Mucosal bleeding was significantly associated with thrombocytopenia 52.3% While 75% of the severely thrombocytopenic neonates had mucosal bleeding.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 of mucosal bleed
Beiner et al[10]	82.3%
Mehta et al[15]	68.2%
Castle et al[8]	70.1%
Present study	52.3%

Immediate Outcome: Mortality rate was high, 25%, among the severely thrombocytopenic neonates while it was only 8.3% moderate thrombocytopenia and non of the babies died with mild thrombocytopenia,showing a poor immediate outcome with severe 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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