ORIGINAL RESEARCH PAPER

Paediatrics

KEY WORDS: Neonatal Thrombocytopenia, Maternal eclampsia, Prematurity, Sepsis

PREVALENCE AND ETIOLOGY OF NEONATAL THROMBOCYTOPENIA IN TERTIARY CARE NICU

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ABSTRACT

Context: Thrombocytopenia is one of the commonest haematological disorders in the neonatal period, affecting up to a third of those admitted to neonatal intensive care units. It is well recognized that many feto maternal and neonatal conditions are associated with thrombocytopenia like maternal eclampsia, Prematurity, Sepsis, Hypoxia, intrauterine growth retardation, and disseminated intra vascular coagulation play an important role in the etiology of neonatal thrombocytopenia.

Methods & material: 140 Newborn admitted in tertiary care NICU were selected to find out prevalence and etiology of neonatal thrombocytopenia. Detail maternal history and neonatal physical examination done and Neonates were followed for outcome ,relevant investigation done according to cases.

Result: Out of 140 neonates 63 neonates had thrombocytopenia (45%). 42.8% neonates were premature out of which 63.3 % had thrombocytopenia. Other neonatal risk factor for thrombocytopenia are sepsis 38 (74.5%), SGA/IUGR 28(80%) and NEC 9(100%). Maternal risk factor for thrombocytopenia are eclampsia 81.8% and infection during pregnancy 72.72%.

Conclusion: The prevalence of neonatal thrombocytopenia was 45% . The most common etiology associated with thrombocytopenia were maternal eclampsia, prematurity and sepsis. Followed by IUGR and NEC.

INTRODUCTION

Thrombocytopenia is one of the commonest haematological disorders in the neonatal period, affecting up to a third of those admitted to neonatal intensive care units. The incidence varies greatly depending upon population studied from <1% in healthy term babies to around one third of neonates admitted to NICU1. It is well recognized that many fetomaternal and neonatal conditions are associated with thrombocytopenia. But until recently, the mechanism underlying many neonatal thrombocytopenia remains unknown. Multiple disease processes can cause neonatal thrombocytopenia, and this can be prematurity, sepsis, hypoxia, intrauterine growth retardation, and disseminated intra vascular coagulation play an important role in the etiology ofneonatal thrombocytopenia. There are very few studies on neonatal thrombocytopenia in central India and also we wanted to find indigenous data in our institute and need to know more about prevalence, etiological profile, predisposing factor and clinical profile.so that we can take necessary preventive measures to reduce neonatal mortality due to thrombocytopenia.

MATERIAL AND METHODS

This is prospective observational study, hospital based study carried out in department of Paediatrics in Indira Gandhi Govt medical College & hospital, during period of January 2018 to June 2019 after acceptance from institutional ethical committee. In this study, a sample of 140 of all the newborns admitted in NICU during this time period except for the ones admitted for observation were selected. Prior written Informed Consent was obtained from the parents or available relatives of each neonate.

All maternal aspects like maternal age, parity, prenatal events like leaking/bleeding > 18 hrs, maternal illness like PIH, eclampsia , hospital admission, maternal drug intake like aspirin, antiplatelet drugs, bad obstetric history ,Rh-isoimmunization, mode of delivery suggesting thrombocytopenia was noted down. In all enrolled newborns detailed history regarding presenting symptoms and physical examination of each neonate was done, neccesary investigation were done accordingly and followed up for outcome. Gestational age was calculated by New Ballard score.

INVESTIGATIONS: CBC (Hb, TLC, DLC, Platelet count, absolute neutrophil count) C- reactive proteins (CRP). Micro-Erythrocyte sedimentation rate (m-ESR), Blood culture and sensitivity, X-ray chest, USG abdomen, LP, Urine routine done if needed.

DEFINITIONS OF IMPORTENT TERMS:

1) PRETERM: Babies born before 37 weeks of gestation.

2) SGA / IUGR: Neonate with birth weight or crown heel length for gestational age less than 10th percentile for GA or <2SD below mean for infant's GA.

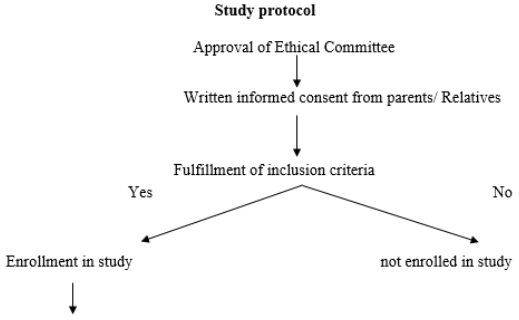
3) NEC: defined according to Bell staging criteria with Walsh and Kleigman classification.

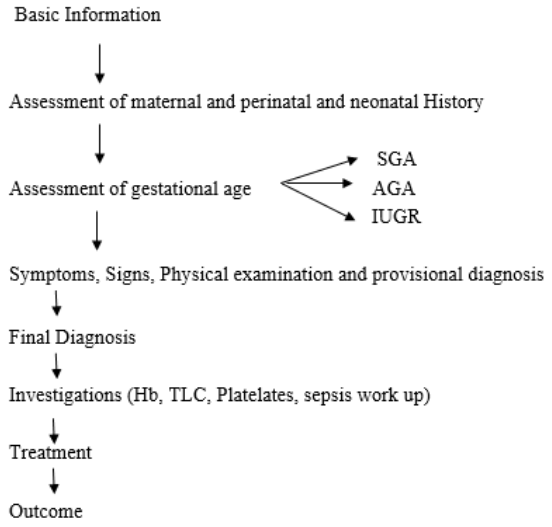
4) SEPSIS : Any two or more of lab parameters of sepsis workup positive (ANC,TLC,MICRO-ESR,CRP,IT RATIO)

5) NEONATAL THROMBOCYTOPENIA-Neonate with platelet count of less than 1.5 lakh/cmm(mild thrombocytopenia is platelet count 1lakh/cmm to 1.5 lakh/cmm, moderate thrombocytopenia is platelet count 50000 to 99000/cmm and severe thrombocytopenia is platelet count <50000/cmm)

6) MATERNAL PIH : Hypertension without proteinuria after 20 wks of gestation

7) ECLAMPSIA: Woman with pre-eclamsia complicated with convulsions and / or coma.



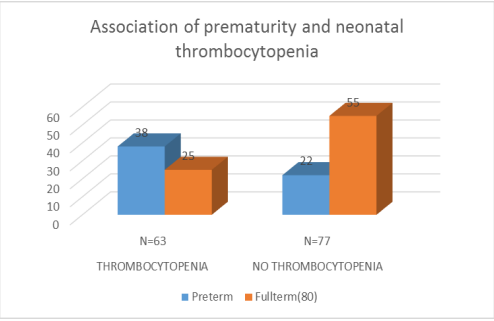


RESULTS

This is observational prospective study carried out in 140 neonates. In this study we found following results Out of 140 neonates 63 neonates had thrombocytopenia, hence prevalence of thrombocytopenia was 45 %.

TABLE 1 : PREMATURITY AND NEONATAL THROMBOCYTOPENIA

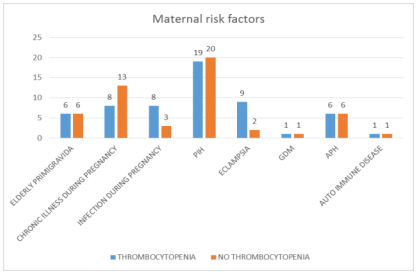
Prematurity	Thrombocytopenia =63	No thrombocytopenia N=77	P value
Present (60)	38 (63.3%)	22 (28.5%)	0.0001
Absent (80)	25 (31.25%)	55 (71.5%)	



Out of 140 neonates 42.8% neonates were premature. 63.3% of premature babies had thrombocytopenia. It was statistically significant. (p value 0.0001)

TABLE 2 : ASSOCIATION BETWEEN MATERNAL RISK FACTORS AND THROMBOCYTOPENIA

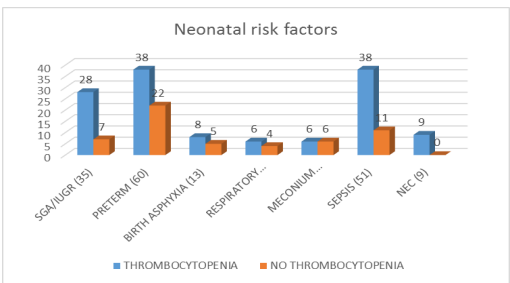
Material Risk Factor	Number	Thrombocytopenia	No Thrombocytopenia	P value
Elderly Primigravida	12	6	6	0.71
Chronic Illness Drug Prgnancy	21	8	13	0.49
Infection during Pregnancy	11	8	3	0.015
PIH	39	19	20	0.588
ECLAMPSIA Eclampsia	11	9	2	0.02
GDM	2	1	1	0.99
APH	12	6	6	0.71
Auto Immune Disease	2	1	1	0.99



Among all maternal risk factors, eclampsia was common risk factor for thrombocytopenia 81.81%.(p value = 0.02) followed by history of infections during pregnancy 72.72 %. It was statistically significant. (p value = 0.015)

TABLE 3: ASSOCIATION BETWEEN NEONATAL RISK FACTORS AND THROMBOCYTOPENIA.

Fetal Risk Factor	Thrombocytopenia	No Thrombocytopenia	P value
SGA/IUGR (35)	28(80%)	7(72%)	0.00
Preterm (60)	38(63.33%)	22(36.44%)	0.0001
Birth Asphxia (13)	8(61.53%)	5(39.47%)	0.2
Respiratory Distress Syndrome (10)	6(60%)	4(40%)	0.32
Meconium Aspiration Syndrome (12)	6(50%)	6(50%)	0.71
Sepsis(51)	38(74.5%)	11(25.5%)	0.00
NEC (9)	9(100%)	0	0.001



Amongst neonatal risk factor IUGR (p value 0.00), prematurity (p value 0.0001), sepsis (p value 0.00) and NEC (p value 0.001) were statistically significant for thrombocytopenia. Out of 140 neonates, Mild thrombocytopenia was observed in 46(32.85%) neonates, moderate thrombocytopenia in 12(8.57%) & severe thrombocytopenia in 5(3.57%). All neonates with severe thrombocytopenia had bleeding manifestations. It was statistically significant (p value-0.000). Amongst cases of severe thrombocytopenia, 60 % had intraventricular haemorrhage.It was statistically significant (p value- < 0.00) Out of 140 neonates those presenting with bleeding manifestionsi.e. GI bleed (7), mucosal bleed (5), malena (4), and petechiae (5) had severe thrombocytopenia i.e.100 %. It was statistically significant (p value-0.000).

Out of 140 neonates, 50(60.97 %) of LBW babies had thrombocytopenia .It was statistically significant (p value 0.00). Out of 140 neonates 135 (96.4 %) neonates were discharged. 5 (3.7%) neonates were died, of which 1 (2.1%) of mild, 1 (8.3%) of moderate and 3(60%) were having severe thrombocytopenia. The mortality in babies with severe thrombocytopenia was high (p value =0.03) which was statisticaly significant.

DISCUSSION

This study is done on 140 neonates in a tertiary care NICU.The prevalence of neonatal thrombocytopenia was 45.0 %. Study by Jeremiah et al 20102 in which the prevalence of neonatal thrombocytopenia was found to be 53.0% .Sonam nadyal et al. 20163 the prevalence of neonatal thrombocytopenia was 63.8%. Patil et al. 20144 observed prevalence of thrombocytopenia was 25.45%. Khalessi et al. 20135 reported prevalence of neonatal thrombocytopenia was 17.9 %.

Out of 140 neonates 60(42.8%) neonates were premature of which 38(63.3%) had thrombocytopenia. Anubha sharma et al. 20156 showed that 58.2% preterm babies developed thrombocytopenia. Keerthi tripathi et al 20177 showed that preterm babies had severe thrombocytopenia.

Among all maternal risk factors, PIH was seen to be more commonly associated with thrombocytopenia. 48.33% babies of PIH mother had thrombocytopenia but it was not statistically significant. All babies who had maternal risk factor as eclampsia had thrombocytopenia which was statisticaly significant (81.81%) followed by history of infections during pregnancy which was 72.72 %. Keerthi tripathi et al 2017 showed that PIH was the commonest maternal risk factor. 27(13.5%) babies had PIH as the maternal risk factor and it was associated with severe thrombocytopenia. Khalessi et al. 2013 in which there was no high percentage of maternal preeclampsia or birth problems among thrombocytopenic neonates.

Most common causes of thrombocytopenia in neonates was of prematurity (63.3%) and sepsis (74.5%) followed by IUGR (80%), NEC (100%). Eslami Z et al. 20138 recorded neonatal sepsis and intra uterine growth retardation as important causes of thrombocytopenia. Sonam Nandyal 2016 showed leading causes neonatal thrombocytopenia include prematurity, sepsis, respiratory distress syndrome, birth asphyxia, meconium aspiration syndrome, hyperbilirubinemia and intra-uterine growth retardation.

In present study, mild thrombocytopenia was observed in 32.85 % neonates, moderate thrombocytopenia in 8.57 % & severe thrombocytopenia in 3.57 %. Khalessi et al. 2013 found 43.5% had mild thrombocytopenia, 25.8% had moderate thrombocytopenia, and 24.1% had severe thrombocytopenia. Jeremiah et al. 2010 observed that amongst thrombocytopenic neonates 39.4% were mild, 12.1% moderate and 1.5% severe.

Amongst neonates of severe thrombocytopenia, 60 % had intraventricular haemorrhag. Von Lindern JS et al. 20119 found that 12% of babies with neonatal thrombocytopenia developed IVH. Beiner et al. 200310 showed strong correlation between neonatal thrombocytopenia and IVH. Amongst babies presenting with bleeding manifestionsi.e. GI bleed (7), mucosal bleed (5), malena (4), and petechiae (5) had severe thrombocytopenia i.e.100 %. Similar results were found in other studies.Khalesssi et al. 2013 showed 6.5% had gastrointestinal bleeding.Patil et al. 2014 showed that mucosal bleeding was significantly associated with thrombocytopenia.

In present study, The percentage of thrombocytopenia in LBW was 60.97 % whereas it was 39.03 % in appropriate weight babies. Similar results were obserevd by Gupta et al. 201211 in which 44.4% babies in LBW group experienced thrombocytopenia. Anubha Sharma et al. 2015 observed 100% of ELBW babies had thrombocytopenia.

In this study out of 140 neonates the mortality was in 5(3.7%) of which 3 babies were having severe thrombocytopenia. Patil et al. 2014 reported that mortality rate was very high 37%, among the severely thrombocytopenic neonates .Bonifacio L et al12 2007 observed that the mortality rate was 16.7%, 32.4% and 45.8% in neonates with mild, moderate and severe thrombocytopenia, respectively.

CONCLUSION

Neonatal thrombocytopenia is one among most common hematological abnormality encountered in NICU. The prevalence of neonatal thrombocytopenia was 45%.The most common etiology associated with thrombocytopenia were sepsis and prematurity followed by IUGR and NEC. Amongs the maternal factor eclampsia was significantly associated with neonatal thrombocytopenia.Clinical signs and symptoms associated with neonatal thrombocytopenia especially severe thrombocytopenia were gastrointestinal and mucocutaneous bleeding, petechiae, malena and IVH. Mortality were higher in babies who has severe thrombocytopenia.

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