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Causes, Severity And Outcome Of Neonatal Thrombocytopenia In Hi-Tech Medicalcollege And Hospital,Bhubaneswar

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ABSTRACT:

BACKGROUND:Thrombocytopenia (platelet count <1,50,000cells/cu.mm) is one of the most common haematological problems in neonatal intensive care units. The overall prevalence of thrombocytopenia in neonates ranges from 1 to 5% and it is much higher in neonates admitted to Neonatal Intensive Care units, ranging from 18 to 35%. Multiple diseases can cause thrombocytopenia in neonates. The important causes are sepsis, birth asphyxia, prematurity, intra-uterine growth retardation, hyperbilirubinemia, respiratory distress syndrome, meconium aspiration syndrome and low birthweight.

OBJECTIVE: The objective were to study the causes, severity and outcome of neonatal thrombocytopenia in neonates admitted to Neonatal Intensive Care Unit in Hi-Tech Medical College and hospital,Bhubaneswar.

METHOD: Prospective randomized controlled trial was done in NICU at Hi-Tech Medical College and Hospital, Bhubaneswar from September 2019 to August 2020. 100 neonates with or developed neonatal thrombocytopenia were involved duringstudy.

RESULT:In this study, out of 100 neonates with thrombocytopenia- 46% were mild, 35% were moderate and 19%were severe thrombocytopenia. 51 neonates(51%) had early onset neonatal thrombocytopenia and 49 neonates(49%) had late onsetneonatal thrombocytopenia. Anaemia was the dominant maternal predisposing risk factor. Sepsis was the most common cause of neonatal thrombocytopenia. Most common symptom was apnoea. Sepsis, Respiratory Distress Syndrome(RDS) and NecrotisingEnterocolitis(NEC) had significantly contributed to mortality. Most common cause of death was Sepsis followed by RDS andNEC.

CONCLUSION:Thrombocytopenia in neonates is a treatable and reversible condition. It is important to identify neonates at risk and initiate transfusion therapy to prevent severe bleeding and potentially significant morbidity. Anaemia and Premature ruptureof membrane(PROM) were the commonest maternal risk factors. Hence, the babies born to mothers with these risk factors should be closely monitored forthrombocytopenia.

KEYWORD: Neonatal Thrombocytopenia, Sepsis, Maternal Anemia, Respiratory DistressSyndrome

I. INTRODUCTION:-

Thrombocytopenia (platelet count <1,50,000/μL) is one of the most common haematological problems in Neonatal intensive care units (NICUs).1 The overall prevalence of thrombocytopenia in neonatal ranges from 1 to 5% and is reported to be much higher in neonates admitted to neonatal intensive care units, ranging from 18 to 35%.[1] It is more common among extremely low birthweight neonates (ELBW <1000 gms birth weight) or preterm babies (GA <36 weeks) or sick neonates in NICUs.1 In contrast, only 2% of the normal neonates are thrombocytopenic at birth with severe thrombocytopenia (platelet count <50,000/μL) occurring in less than 3/1000 term infants.[2]Multiple disease processes can cause thrombocytopenia in neonates and these can be classified as early onset (<72hours) and late onset (>72 hours) neonatal thrombocytopenia.[3] The important causes of thrombocytopenia in neonates are sepsis, birth asphyxia, prematurity, intra-uterine growth retardation, hyperbilirubinemia, respiratory distress syndrome, meconium aspiration syndrome and low birth weight. Apart from platelet count, bleeding manifestations depend on underlying ailments.[4] Platelets are small anucleate fragments that are formed from the cytoplasm of megakaryocytes and have acharacterisitic discoid shape.[5]Considerable number of studies have shown that the average fetal platelet count is above 150,000/μL by second

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trimester of pregnancy and remain constant then represents thrombocytopenia just as in older children and adults. Neonatal thrombocytopenia classifies into mild (>1,00,000/µl and <1.50,000/µl), moderate (>50,000/µl) and severe (<50,000 µl).[1,2]

II. METHODS:-

Prospective study involving 100 neonates with or developed neonatal thrombocytopenia randomly selected in the Neonatal intensive care unit (NICU) at Hi-Tech Medical College and Hospital, Bhubaneswar from September 2019 to August 2020.

A detailed history inclusive of maternal obstetric history, birth history, perinatal events with a focus on history suggestive of bleeding and its type in the newborn was obtained as per the proforma.

Information regarding a number of conditions associated with neonatal thrombocytopenia was prospectively recorded like history of PIH, gestational diabetes mellitus, premature rupture of membranes, anaemia and SLE. Any consumption of drugs by the mother that can predispose to neonatal thrombocytopenia was also documented. Gestational age of all neonates was determined based on the New Ballard's scoring system till 14 days of life. All the neonates underwent blood investigations, CBC, peripheral blood smear study, blood culture and sepsis screening. Low platelet counts were cross verified by peripheral smear study.

Platelet counts were repeated every 24 hours in babies with severe thrombocytopenia and every 48 hours in those with moderate thrombocytopenia. PT and APTT were obtained by automated CL analyzer. Other investigations such as urine culture, chest X-ray, neurosonogram and CT brain were performed whenever needed.

The data was recorded in the case proforma and tabulated. Statistical analysis was done using chi square test, one-way ANOVA test, students t-test. Software used for analysis was SPSS 17.0 version, 'P' value below 0.05 was considered significant.

III. RESULT:-

The study was conducted on 100 newborns with thrombocytopenia admitted in the NICU and subjects were divided into 3 groups based on their platelet counts.(Table 1)

Table 1: Distribution of babies according to severity

Groups	Severity	N=100	Percentage
Group 1	Mild (1-<1.5 lacs/µl)	46	46%
Group 2	Moderate (50,000-<1 lacs/µl)	35	35%
Group 3	Severe (<50,000/µl)	19	19%

The most common maternal risk factor was anaemia which was present in 48 (48%) babies followed by PROM 30 (30%), PIH 19 (19%), oligohydramnios 2 (2%) babies and eclampsia in 2 (2%) babies. Out of these risk factors, association of anaemia with severe neonatal thrombocytopenia was statistically significant (P value <0.05) (Table 2).

About 51 (51%) babies had early onset neonatal thrombocytopenia and 49 (49%) babies had late onset neonatal thrombocytopenia.

Table 2:- Distribution of babies according to maternal risk factors

Maternal factor		Group 1	Group 2	Group 3	Total	X^2 value	P value
PIH	Yes No	9 37	9 26	1 18	19 81	3.3644	0.1859
Eclampsia	Yes No	0 46	2 33	0 19	2 98		
PROM	Yes No	11 35	10 25	9 10	30 70	3.574	0.1673
Anemia	Yes No	26 20	11 24	11 8	48 52	5.9944	<0.05
Oligohydro minos	Yes No	1 45	1 34	0 19	2 98		

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Sepsis was the commonest cause of neonatal thrombocytopenia and was found in 53 (53%) babies. RDS in 15 (15%), Birth asphyxia was present in 11 (11%) babies, MAS in 10 (10%) babies, neonatal hyperbilirubinemia in 6 (6%) babies and NEC in 5 (5%). Sepsis was associated with severe neonatal thrombocytopenia and it was statistically significant (P value 0.0001). Out of 53 babies with sepsis, 36 (67.92%) babies had late onset thrombocytopenia and it was statically significant (P value 0.00003) (Table 3).

Table 3: Distribution of babies according to their Etiology.

Etiology		Group 1	Group 2	Group 3	Total	X^2 Value	P value
Sepsis	Yes	14	24	15	53	17.94	0.0001
	No	32	11	4	47		
Birth Asphyxia	Yes	7	3	1	11	1.6853	0.4305
	No	39	32	18	89		
RDS	Yes	13	2	0	15		
	No	33	33	19	85		
Neonatal Hyperbilirubinemia	Yes	4	1	1	6	1.223	0.5422
	No	42	34	18	94		
MAS	Yes	7	3	0	10		
	No	49	32	19	90		
NEC	Yes	1	2	2	5	2.03	0.361
	No	45	33	17	95		

The most common symptom of thrombocytopenia was apnoea in 28 (28%) followed by lethargy in 24 (24%), feeding difficulty in 23 (23%) and convulsions in 20 (20%) babies. All the above symptoms were predominantly present in moderate and severe neonatal thrombocytopenia.

The mortality was significantly high in severe thrombocytopenia group (47.37%) as compared to other 2 groups and it was not statistically significant (p value 0.2286). The mortality was high in late onset neonatal thrombocytopenia group (40.82%) as compared to early onset neonatal thrombocytopenia group (27.45%) but it was statistically not significant. Out of 34 deaths, 23 (67.64%) due to sepsis followed by NEC 3 (8.82%), RDS 3 (8.82%), MAS 2 (5.88%), birth asphyxia 2 (5.88%) and neonatal hyperbilirubinemia 1 (2.9%). Death due to sepsis was significantly high (Table 4).

Table 4: Correlation of Etilogy and Outcome

Etiology	Number of cases	Number of Deaths	Percentage
Sepsis	53	23	67.64%
Birth Asphyxia	11	2	5.88%
RDS	15	3	8.82%
Neonatal Hyperbilirubinemia	6	1	2.9%
MAS	10	2	5.88%
NEC	5	3	8.82%

IV. DISCUSSION:

Neonatal thrombocytopenia (platelet count <1.5 lacs/µl) is one of the commonest haematological abnormality encountered in NICU and if it is not detected and managed properly can result in devastating complications.

The severity of neonatal thrombocytopenia in this study was mild in (46%), moderate in (35%) and severe in (19%). The results were similar to studies conducted by KhalessiN et al, and Ghamdi AM et al.[7,8] The high prevalence of moderate and sever thrombocytopenia in this study was probably because of higher proportion of septicemic babies in our NICU which is a tertiary care centre.

In this study, anaemia was the commonest maternal risk factor. 48% mother had anaemia and it was associated with all type thrombocytopenia. Other maternal risk factors were PROM in 30%, PIH 19%, oligohydramnios in 2% and eclampsia in 2% babies. All these risk factors were associated with severe thrombocytopenia.Among all these factors, association of anaemia with severe neonatal thrombocytopenia was statistically

significant (P value <0.05). In a study conducted by Tirupath K et al, an association has been documented between anaemia and thrombocytopenia. PROM in mother is a cause of early onset neonatal sepsis eventually leading to neonatal thrombocytopenia.[14]

Among neonatal risk factors sepsis was the most common cause of neonatal thrombocytopenia which was found in 53% babies and was associated with severe neonatal thrombocytopenia. In studies conducted by Basil M et al, and Gupta A et al, sepsis was associated with thrombocytopenia which was similar to this study.[3,16]Septicaemia leads to thrombocytopenia due to both decreased production and increased consumption of platelets and hence results usually in severe thrombocytopenia.

RDS was in 15%, birth asphyxia was present in 11%, MAS in 10% and neonatal hyper bilirubinemia in 6% babies. Birth asphyxia was associated with mild to moderate thrombocytopenia. In studies conducted by Nandyal SS et al, and Gupta A et al, birth asphyxia was associated with severe thrombocytopenia.[3,4]

In this study, sepsis was significantly associated with late onset thrombocytopenia and birth asphyxia was significantly associated with early onset neonatal thrombocytopenia.

The overall mortality in thrombocytopenic babies in this study was 34%. Mortality in this study was more as compared to other studies. Mortality was high (40.82%)in late onset neonatal thrombocytopenia group, however it was statistically not significant.

Out of 34, deaths due to sepsis were 23 (43.40%) followed by NEC 3 (60%), RDS 3 (20%), MAS 2 (20%), birth asphyxia 2 (18.18%) and neonatal hyperbilirubinemia 1 (16.67%).

V. CONCLUSION:

Neonatal thrombocytopenia is a treatable and reversible condition. Hence, it is important to identify neonates at risk and initiate transfusion therapy to prevent severe bleeding and potentially significant morbidity. The severity of neonatal thrombocytopenia in the NICU was moderate to severe type. Late onset neonatal thrombocytopenia was more common than early onset neonatal thrombocytopenia. Low birth weight babies were more prone to severe thrombocytopenia. Preterm babies had severe thrombocytopenia whereas term babies had moderate thrombocytopenia. Anaemia and PROM were the commonest maternal risk factors. Therefore, authors recommended that babies born to mothers with these risk factors should be closely monitored for thrombocytopenia.

Sepsis and RDS were the commonest neonatal factors associated with thrombocytopenia. Sepsis was associated with late onset thrombocytopenia and RDS was associated with early onset thrombocytopenia. The most common symptom in all forms of thrombocytopenia was apnoea. The most common sign was cutaneous bleeding (petechiae/purpura). Mortality was significantly high in babies with severe neonatal thrombocytopenia, in those with early onset neonatal thrombocytopenia and in cases where thrombocytopenia was due to sepsis and birth asphyxia.

Severe thrombocytopenia can be used as a prognostic indicator in sick neonates. But to generalize this statement and apply to all neonatal admission, more studies are required in this regard with similar results.

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