



THROMBOCYTOPENIA CORRELATION WITH SEVERITY OF HYPOXIC ISCHEMIC ENCEPHALOPATHY.

Neonatology

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KEYWORDS

INTRODUCTION:

Encephalopathy is a term used to describe central nervous system dysfunction. Neonatal encephalopathy associated with perinatal asphyxia is called hypoxic ischemic encephalopathy (HIE). Multiorgan systems involvement is a hallmark of hypoxic-ischemic encephalopathy. (1) Thrombocytopenia develops in 22–35% of all babies admitted to neonatal intensive care units (NICUs), in up to 50% of those admitted to NICUs who require intensive care and in 50% of sick preterms (2) From a coagulation perspective, moderate thrombocytopenia is reported in asphyxiated neonates although statistical significance is inconsistent among publications. (3) The exact mechanism of thrombocytopenia in perinatal asphyxia is not clear. In addition, not much is known on the correlation between the severity of perinatal asphyxia and the risk and severity of thrombocytopenia at birth.(4)

METHODOLOGY:

This is a Hospital based retrospective observational study for duration of 2 years at Niloufer hospital in Newborn up to 1 month age. Inclusion Criteria: Babies with APGAR score of less than 7 at 5 minute and only inborn babies were included in the study. Exclusion criteria: Babies with congenital cardio pulmonary malformation, those born mother with diabetes mellitus and hypertension treated with diuretics, general anaesthesia, phenobarbitone, pethidine, magnesium sulphate and other drugs likely to cause depression.

A platelet count less than 150,000/cu mm is defined as thrombocytopenia within 72 hours of life. The platelet counts were done by an automated system and confirmed by a pathologist by peripheral smear. Babies were divided in to two groups. GROUP A mild grade birth asphyxia corresponding to stage 1 sarnat and sarnat staging and GROUP B moderate to severe birth asphyxia corresponding to grade 2 and 3 of sarnat and sarnat staging of hypoxic ischemic encephalopathy.

Cases were selected based on inclusion criteria. Data were extracted from a patient database, medical records and laboratory files. details clinical examination and physical findings were recorded from files in designed proforma. Medical records were reviewed for prenatal care and maternal characteristics, labor and delivery data, and neonatal records. All data is entered in entered in to excel sheet and analyzed. Statistical analysis was defined significant if P value <0.05 .

RESULTS:

Total 102 babies had birth asphyxia during this period of study and were included in the study. GROUP A had 74 babies mild birth asphyxia and in GROUP B had 28 babies moderate to severe birth asphyxia as shown in table 1

TABLE 1: staging of hypoxic ischemic encephalopathy and platelet counts.

GROUP	Staging HIE	Number of cases	Platelet count mean and standard deviation
GROUP A	Mild HIE	74	220135 +/- 91703
GROUP B	Moderate to severe HIE	28	187242 +/- 14726

Total 102 babies in study 69 were male and 43 were female. Mean weight of the babies in study was 2.36 kg with standard deviation of 0.59.

Thrombocytopenia was present in 38 cases of birth asphyxia babies of total 102 babies (37.2%).

In GROUP A 25 babies had thrombocytopenia of total 74 babies (33.78%) and in GROUP B 13 babies had thrombocytopenia of total 28 babies (46.6%) shown in Table 2

TABLE 2: Thrombocytopenia correlation with staging of hypoxic ischemic encephalopathy

GROUP	Thrombocytopenia cases (percentage)	Thrombocytopenia mean and standard deviation
GROUP A (Mild HIE)	25 (75.8%)	134800 (41654)
GROUP B (Moderate to severe)	13 (34.2%)	96340 (55042)

Thrombocytopenia values were not statistically significant between cases in GROUP A and GROUP B with t value of 1.34 and p value of 0.18 (>0.05).

A total of 13 cases with THROMBOCYTOPENIA in HIE unfortunately expired. Only 1 baby out of 25 (4%) with THROMBOCYTOPENIA in mild HIE expired, whereas 12 babies out of 13 (92.3%) with THROMBOCYTOPENIA in moderate to severe HIE expired.

TABLE 3: Thrombocytopenia correlation with mortality in hypoxic ischemic encephalopathy.

	Thrombocytopenia cases	Deaths in thrombocytopenia cases
GROUP A Mild HIE	25	1 (4%)
GROUP B Moderate to severe HIE	13	12 (92.3%)
Total	38	13 (34.2%)

DISCUSSION:

Asphyxia may occur during, after, or remote from delivery. Intrapartum hypoxic-ischemic encephalopathy is a type of NE in preterm and term newborns.(5) Asphyxia occurs in one to six per 1000 live births (6). It is a major cause of neonatal morbidity and mortality worldwide and accounts for fewer than 15% of cases of cerebral palsy. Approximately 30% of encephalopathic newborns have thrombocytopenia during the first week after birth. (5).

A different variety of thrombocytopenia has been described among neonates after perinatal asphyxia. Although DIC can occur in such patients, and can cause thrombocytopenia from PLT consumption, the majority of neonates reported with thrombocytopenia after birth asphyxia do not have evidence of consumptive coagulopathy (7) This

entity has been identified as “thrombocytopenia of perinatal asphyxia.” The exact mechanism of this finding is unclear. Some authors have proposed an inverse relationship between red blood cells and platelet production with stimulation of erythropoietin leading to a decrease in the number of immature megakaryocytes and decreased thrombocytopoiesis.(5,8) A previous study reported that acute severe hypoxia significantly shortens the platelet survival time. (9) Other studies found that hypoxia impairs the platelet production by altering megakaryocyte structural and functional characteristics, as shown by a marked reduction in circulating megakaryocytes and their precursor cells. (10)

In our study results suggest that approximately 37% of neonates had thrombocytopenia of perinatal asphyxia, it was more than risk of thrombocytopenia in NICU population (22-25%). In this study, mortality rate was 34 % in the thrombocytopenic neonates.

In study done by Sarnat HB et al commented in their study that birth asphyxia has consistently been associated with evidence of thrombocytopenia and DIC in sick neonates. (ref 11) In study done by Krost LM et al Platelet counts were significantly lower in neonates with encephalopathy ($p < 0.001$). (12). In study by Nursen BELET et al they couldn't find any correlation between the severity of HIE and platelet count and also the effect of thrombocytopenia on mortality ratio in perinatal asphyxia. (13)

The only treatment available for neonatal thrombocytopenia, except for immune thrombocytopenia, is platelet transfusion. Neonates should receive 10-15 ml/kg of cytomegalovirus safe or leukoreduced platelets and they are at increased risk for transfusion-associated graft versus host disease. (2)

THROMBOCYTOPENIA can be useful laboratory parameter in predicting the poor outcome in moderate to severe HIE..and regular monitoring and timely optimal treatment can be of great use to SALVAGE these tender NEONATES who are the FUTURE citizens.

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