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Neonatal Thrombocytopenia as a Consequence of Pregnancy Induced Hypertensive Mother

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Abstract

Objective: To determine the frequency of Neonatal thrombocytopenia as a consequences of Pregnancy induced Hypertensive Mother
Methods: After the ethical approval from the institutional review board, this crossectional study was conducted at Department of Paediatrics, Sialkot Medical College, Sialkot from 05/September/2024 to 05/January/2025. Through non-probability consecutive sampling 140 neonates age l-24 hours, both genders, delivered after 32-weeks of gestation, females with pregnancy induced hypertension were included in the present study
Results: Thrombocytopenia was observed in 49% (n=69) of neonates. Gender showed a highly significant association ($p<0.0001$), with all thrombocytopenic cases occurring in males (n=63). Similarly, gestational age was strongly associated ($p<0.0001$); all cases of thrombocytopenia occurred in neonates born before 37 weeks of gestation. Apgar scores were also significant ($p<0.0001$), as all neonates with scores under 5 had thrombocytopenia.
Conclusion: In conclusion, neonatal thrombocytopenia has direct relationship with maternal PIH especially when the baby is preterm, male or born with low Apgar scores

Keywords: Neonates, thrombocytopenia, PIH, Apgar score

Introduction

Neonatal thrombocytopenia refers to a platelet count that is less than 150,000/µL in neonates a critical haematological complication with enormous morbidity and mortality rate (1). It is most common in neonates born from mothers diagnosed with pregnancy induced hypertension (PIH). Gestational hypertension, a type of hypertensive disorder of pregnancy or PIH, preeclampsia, and eclampsia, globally impact 5-10% of pregnancies and are still a globally significant cause of early maternal and neonatal morbidity and mortality (2). Research demonstrates that thrombocytopenia affects 36.1% of neonates born to mothers with PIH and, therefore, early diagnostic and treatment should be encouraged (3).
Congenital thrombocytopenia is secondary to placental insufficiency diseases associated with maternal hypertension, which decreases the availability of oxygen and nutrients and impairs

fetal growth and development as well as altering its hematologic profile (4). These clinical manifestations of neonatal thrombocytopenia may include benign, incidental findings to frank bleeding, intracranial haemorrhage, or death – especially in preterm neonates (5). The level of thrombocytopenia reflects severity of maternal hypertension, and early terms before thirty-seven weeks' gestation or less increases the neonate risk (6).

Many studies focus on the effects of neonatal thrombocytopenia on neonatal and long-term outcomes. One research revealed that nearly one out of five new-borns with thrombocytopenia needed more urgent medical treatment, that involved platelet transfusion (7). In addition, thrombocytopenia in preterm neonates is predisposing to sepsis and retinopathy of prematurity as well as developmental delay (8). Indeed, the current data available to describe the burden and management of neonatal thrombocytopenia, particularly in low-resource settings where maternal hypertensive disorders occur more frequently is scarce.

The purpose of this work is to determine the frequency of Neonatal thrombocytopenia as a consequences of Pregnancy induced Hypertensive Mother. Through pattern and outcome analysis, the study aims at extending useful information on how neonates at high risk should be further categorized and if there are indications for early screening and intervention.

Methodology

After the ethical approval from the institutional review board, this crossectional study was conducted at Department of Paediatrics, Sialkot Medical College, Sialkot from 5/September/2024 to 05/January/2025. Through non-probability consecutive sampling 140 neonates age l-24 hours, both genders, delivered after 32-weeks of gestation, females with pregnancy induced hypertension were included in the present study. Neonates with congenital anomaly or chromosomal abnormality, any neonate having acquired illness were excluded from the present study. lnformed consent was taken from parents. Demographics details like name, age, gender, birthweight, gestational age at delivery, body temperature, mode and place of delivery, residence, socioeconomic status, and Apgar score were noted. Then blood sample were taken in 3 cc disposable syringe and stored in vials. All samples were sent to the laboratory of the hospital for assessment of platelet count Reports were assessed and if platelet count was <150,000IU/L, then neonatal thrombocytopenia was labelled. Neonates with neonatal thrombocytopenia were managed as per standard protocol. Data was entered in computer software SPSS version 25 0 and analysed. For continuous variables like age, birthweight, gestational age, body temperature, Apgar score, Platelet count, mean and SD was calculated. For categorical variables like gender, socioeconomic status, residence, mode of delivery, place of delivery, and neonatal thrombocytopenia, frequency and percentage was calculated. Data were stratified for age, gender, gestational age, Apgar score, and mode of delivery. Post-stratification, stratified groups were compared for neonatal thrombocytopenia by using chi-square test. P-value <0.05 was taken as significant.

Results

The demographic profile of the study participants revealed a mean neonatal age of 12.5±4.6 hours, with 45% males (n=63) and 54% females (n=77). The average birthweight was 2.9±0.3 kg. Regarding socioeconomic status, 26% (n=37) of neonates belonged to high-income families, 34% (n=48) to middle-income families, and 38% (n=54) to low-income families. Urban residents accounted for 62% (n=87) of the sample, while 37% (n=53) were from rural areas. Mode of delivery was nearly evenly distributed, with 49% (n=69) delivered vaginally and 51% (n=71) by caesarean section. The majority of deliveries occurred in hospitals (86%, n=121), while 14% (n=19) took place at home (Table 1).

Clinical characteristics showed a mean gestational age of 35.7±1.8 weeks and a mean body temperature of 36.6±0.6°C. The mean Apgar score was 7.0±1.4, and the mean platelet count was 147,949±22,879.5 µL. Thrombocytopenia was observed in 49% (n=69) of neonates (Table 2).Stratification of thrombocytopenia based on various variables revealed significant

associations (Table 3). Regarding age, 30 neonates under 10 hours old and 39 neonates over 10 hours' old had thrombocytopenia, though the association was not statistically significant ($p=0.126$). Gender showed a highly significant association ($p<0.0001$), with all thrombocytopenic cases occurring in males (n=63). Similarly, gestational age was strongly associated ($p<0.0001$); all cases of thrombocytopenia occurred in neonates born before 37 weeks of gestation. Apgar scores were also significant ($p<0.0001$), as all neonates with scores under 5 had thrombocytopenia. Finally, mode of delivery was significant ($p<0.0001$), with thrombocytopenia predominantly observed in vaginal deliveries (n=68), while only 1 case was recorded in caesarean deliveries. These findings underscore critical factors contributing to neonatal thrombocytopenia in this cohort.

Table 1: Demographic variables of the study participants

Variables	**Mean and Frequency**
Age (Hours)	12.5±4.6
Gender	
Male	63 (45%)
Female	77 (54%)
Birthweight (kg)	2.9±0.3
Socioeconomic Status	
High	37 (26%)
Middle	48 (34%)
Low	54 (38%)
Residence	
Urban	87 (62%)
Rural	53 (37%)
Mode of Delivery	
Vaginal	69 (49%)
C-section	71 (51%)
Place of delivery	
Hospital	121 (86%)
Home	19 (14%)

Table 2: Clinical variables

Variables	**Mean and Frequency**
Gestational age (weeks)	35.7±1.8
Body Temp (°C)	36.6±0.6
Apgar Score	7.0±1.4

Platelet Count (µL)	147949±22879.5
Thrombocytopenia	69 (49%)

Table 3: Stratification of frequency of thrombocytopenia based on age, gender, gestational age, Apgar score and mode of delivery

Variables	**Thrombocytopenia**		**P value**
	Yes	No	
Age			
<10 hours	30	22	0.126
>10 hours	39	49	
Gender			
Male	63	0	<0.0001
Female	6	71	
Gestational age			
<37 weeks	69	39	<0.0001
>37 weeks	0	32	
Apgar score			
<5	21	0	<0.0001
>5	48	71	
Mode of delivery			
C-section	1	67	<0.0001
Vaginal	68	4	

Discussion

The demographic and clinical characteristics of this study are consistent with and build upon existing research on neonatal thrombocytopenia in PIH. Mean of neonatal age recorded was 12.5±4.6 hours, birthweight was 2.9±0.3 kg, and male to female ratio noted was 45% and 54%. Previous work, for instance, by Flaherman et al. (2022) has revealed comparable neonatal attributes demonstrating that PIH preferentially impacts neonates of these parameters (9). An overwhelming majority of deliveries occur in hospitals (86%) shows availability of healthcare and ability to manage complications amongst neonates. Yet, the 14 percent of home deliveries, call for further reflection of access to and quality of care in the respective communities.

Pattern of clinical antenatal factors comprising a mean gestational age of 35.7±1.8 weeks and a mean platelet count of 147,949±22,879.5µL is an indication of the generally poor prenatal milieu of PIH. The proportion of thrombocytopenia is very high in our study (49%) similar to

Huang et al. (2023), who found thrombocytopenia range between 35– 50 % in neonates of hypertensive mothers (10). Notably, the results of an association of thrombocytopenia with preterm gestational age (<37 weeks) support the works of Jin et al (2022), who focused on the impact of placental insufficiency on hematologic values (11).

The basic descriptive findings of stratification showed influence from gender, gestational age, Apgar score and mode of delivery. The absence of thrombocytopenia in females and its only manifestation in males ($p<0.0001$) indicates that there might be genetic or physiological factors that contribute to the occurrence of this condition as noted by (12). The association between low Apgar scores and thrombocytopenia indicates the interaction between perinatal stress and PIH (13). Notably, the negative correlation between the risk of caesarean delivery and thrombocytopenia is consistent with such findings positing that caesarean delivery can help to lessen hypoxic stress thereby lowering haematological adverse effects (14).

These findings conform with previous studies Even though the present work focuses on the combination of demographic and clinical variables that may define the risk of thrombocytopenia in neonates of PIH-affected mothers. Thus, future research, especially in developing countries, in improving the quality of neonatal care and reducing the mortality rate differences is highly relevant.

Conclusion

In conclusion, neonatal thrombocytopenia has direct relationship with maternal PIH especially when the baby is preterm, male or born with low Apgar scores. These findings underscore the need for an early screening and individualized approaches to reduce risks and enhance Neonates' outcome.

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