

## PREVALENCE OF THROMBOCYTOPENIA IN NEONATES ADMITTED AT REHMAN MEDICAL INSTITUTE PESHAWAR

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### **ABSTRACT**

#### **OBJECTIVES:**

*Thrombocytopenia is a common hematological abnormality and is defined as platelet count less than  $100 \times 10^9/L$ . The present study aims to determine the prevalence of thrombocytopenia among neonates.*

#### **METHODOLOGY:**

*The study was conducted at Rehman Medical Institute (RMI) Peshawar from 1<sup>st</sup> February till 31<sup>st</sup> March 2021. A total of 100 neonates with the age  $\leq 28$  days were randomly selected.*

#### **RESULTS:**

*Male to female ratio was 61:39 in this study. Among all the 100 neonates, 76% have platelets count above the normal value while 24% have thrombocytopenia. 52% of the neonates aged up to 3 days while 36% of the neonates aged 4-14 days and 12% neonates aged above 14 days. Thrombocytopenia was present in 11 % of neonates aged 72 hours or less whereas it was 13% in neonates aged more than 72 hours of life.*

#### **CONCLUSION:**

*The study concludes high prevalence of thrombocytopenia among neonates, which may be attributed to parent's lack of awareness and poor lifestyle.*

**KEYWORDS:** *Thrombocytopenia, Neonates, Age, Hospitalization*

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#### **INTRODUCTION:**

Health is a state of complete physical, mental and social well-being and not only the absence of disease or illness<sup>1</sup>. Thrombocytopenia is defined as a platelet count under  $150 \times 10^9/L$ . However, healthy neonates tend to have platelet count in the range of 150 to  $400 \times 10^9/L$ . Thrombocytopenia is one of the most common hematological complications in neonates<sup>2</sup>. Thrombocytopenia of

the newborn is defined by thrombocytes count under  $150 \times 10^9/L$  equally in preterm and full-term newborn. About 30% of the newborn at the time of hospitalization at the neonatal intensive care unit (NICU) has one episode of thrombocytopenia<sup>3</sup>. Platelets are made in the bone marrow by megakaryocytes. Proplatelets transform into platelets in the lungs. In healthy state, platelets count remains constant throughout the life. Pathophysiology of thrombocytopenia can be defined by hemodilution, elevated levels of platelet consumption, compromised platelet production and high platelet destruction<sup>4</sup>. Regulation of thrombopoiesis is affected by age. In comparison to adults, neonates have low platelets, with a reduced rate of platelet formation. However, since platelets count from the cord blood of fetuses and newborn fall within the normal adult range, the hypothesis that fetal megakaryocyte

progenitors have a higher proliferative rate has been planned and some in vitro evidence indicates that enhanced sensitivity of neonatal megakaryocytes to cytokines may be involved in thrombocytopenia. Despite this, thrombocytopenia occurs commonly in NICUs<sup>5</sup>. Thrombocytopenia is the commonest hematological irregularity encountered in the neonatal intensive care unit (NICU) after anemia. Megakaryocytes first appear in the fetus by five to six weeks of post-conceptual age<sup>6,7</sup>. The normal platelets count of all healthy newborn infants, regardless of gestational age, should be  $150 \times 10^9/L$  and above, and the count below this represents thrombocytopenia, just as in older children and adults. After causal therapy, regulation of platelet value should occur within 5 to 7 days, and if not, that is a warning to look for another cause of disease. Thrombocytopenia is a very frequently shared hematological deformity encountered in the neonatal period<sup>8</sup>. The presence of thrombocytopenia is highly variable in newborns, with the prevalence being significantly higher in sick infants<sup>9</sup>.

#### METHODOLOGY:

This research was carried out at Rehman Medical Institute (RMI) Peshawar. After the approval from head of the institute, data for all variables including demographic information was recorded on predesigned Performa after taking consent from the participant guardians. The study included all those neonates born in RMI between 1st February to 31 March 2021 aged  $\leq 28$  days. The study duration was 2 months and the sample size was 100. The blood was collected from neonates in purple color Ethylene diamine tetra acetic acid (EDTA) tube. The samples were analyzed by Sysmex for platelet estimation. The normal range of platelets is ( $150-450 \times 10^9/L$ ) if the count of platelets is less than  $150 \times 10^9/L$  it is considered as thrombocytopenia. Data was analyzed using SPSS 24.

#### RESULTS:

A total of 100 neonates of both genders were investigated and categorized into two groups i.e. those having platelets count more than  $150 \times 10^9/L$  considered as normal while those having platelets count less than  $150 \times 10^9/L$  considered as thrombocytopenic. The study showed that 76% neonates have platelets count above  $150 \times 10^9/L$  while 24% have platelets count less than  $150 \times 10^9/L$  and were considered as thrombocytopenic (Figure 1).

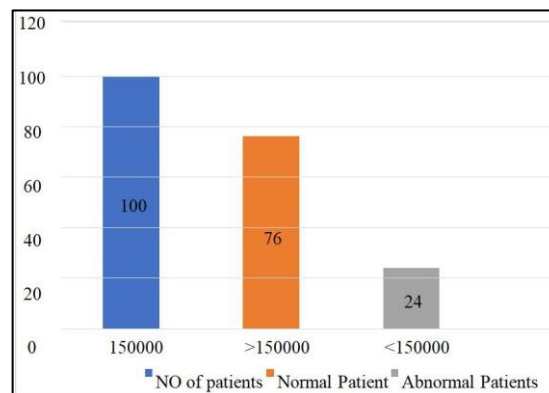


Figure 1: Platelet Count

On the basis of age, the subjects were categorized into 3 groups. Group 1 (52%) have age  $\leq 3$  days while group 2 (36%) have age range of 4-14 days and group 3 (12%) consisted of neonates having age of  $>14$  days (Figure 2).

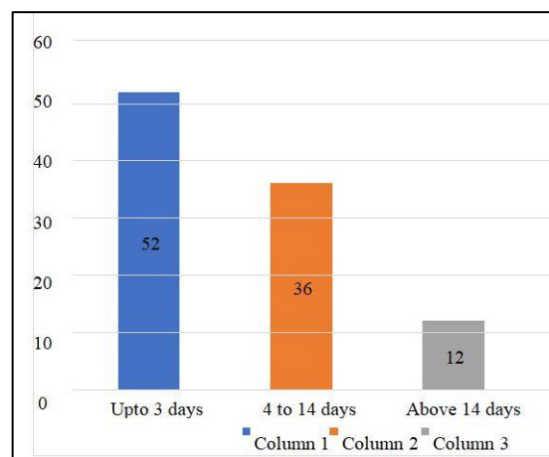


Figure 2: Age Wise Distribution of Neonates

On the basis of age, 46 neonates in group 1 had platelets count above  $150 \times 10^9/L$  and were considered normal whereas 10 neonates had platelets count less than  $150 \times 10^9/L$  and were declared thrombocytopenic. In group 2, 18 neonates had platelets count above  $150 \times 10^9/L$  and were considered normal while 9 neonates were thrombocytopenic. In group 3, 12 neonates had platelets count above  $150 \times 10^9/L$  (normal) and 5 were thrombocytopenic (Figure 3).

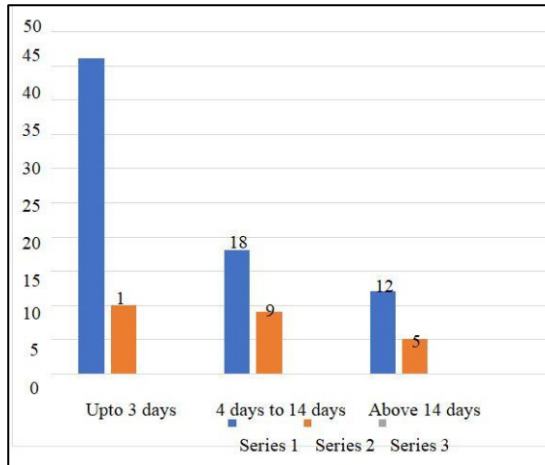


Figure 3: Age Wise Distribution of Platelet Count

## DISCUSSION:

Platelets are highly organized nuclear cellular fragments involved in primary homeostasis. Platelets released into the bloodstream have a life span of 7 to 10 days. The normal range for platelets count in newborns and infants is  $150 \times 10^9/L$  to  $450 \times 10^9/L$ . Thrombocytopenia, defined as a platelet count  $<150 \times 10^9/L$  is a very common hematological abnormality in the neonatal period<sup>10</sup>. About 1.6 million neonatal deaths occur worldwide every year, 40% of which occur in developing countries, particularly Asia and Africa<sup>11</sup>. Thrombocytopenia, which presents after the first 3 days of life, is due to sepsis or necrotizing enterocolitis in more than 80% of cases. The most frequent cause of early-onset thrombocytopenia is associated with chronic fetal hypoxia, as occurs in infants born to mothers with pregnancy-induced hypertension or diabetes and or in those with intrauterine growth restriction<sup>12</sup>. The most common cause of thrombocytopenia present in the first 72 hours of life, and occasionally in fetal life, is almost all related to complications of pregnancy and/or delivery. By contrast, the vast majority of neonates developing thrombocytopenia after the first 72 hour of life do so as a result of a postnatal acquired bacterial infection<sup>13,14</sup>. The differential diagnosis for thrombocytopenia is classically divided into disorder of disease platelets production versus those of increased platelets consumption<sup>15</sup>. The current study showed 24% prevalence of thrombocytopenia in neonates suggesting that the frequency of thrombocytopenia in our region is still high among the neonates. The results of this study are in agreement with the previous study,<sup>16, 17</sup> but in contrast to studies conducted earlier<sup>18</sup>. There was no

gender predilection in this study, which further strengthens the previous results<sup>19</sup>.

## CONCLUSION:

The study concludes that the frequency of neonatal thrombocytopenia is still high in Khyber Pakhtunkhwa Pakistan due to poor health conditions and lack of awareness. It is further concluded that the most common cause of thrombocytopenia was infection and pregnancy and/or delivery related complications for which we have to educate the mother about her health for improving the life cycle.

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