PLATELET COUNT PROFILE IN CHILDREN DIAGNOSED WIYH DENGUE FEVER ON THE THIRD TO FIFTH DAY

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ABSTRACT
Dengue Fever is a disease caused by the Dengue virus, transmitted through the bite of *Aedes aegypti* and *Aedes albopictus* mosquitoes. Dengue fever can affect anyone, including children, who are particularly vulnerable to this illness. A significant drop in platelet count in patients is due to the increased destruction of platelets by the reticuloendothelial system. Thrombocytopenia, typically occurring on the third or fourth day of illness, aids in the diagnosis of dengue fever. This study aims to examine the pattern of platelet count in children with dengue fever based on the day of fever. The research is a retrospective study, reviewing the medical records of pediatric dengue patients treated at RSU Hermina Arcamanik between March and April 2024. A total of 30 pediatric patients were included. The majority of dengue cases were observed in male patients (18 respondents) and in the age group ≤ 5 years (13 respondents). The average platelet count on the fourth day of illness was approximately 85,770/mm³
Keyword: Dengue, thrombocytopenia, *Aedes aegypti*, *Aedes albopictus*

INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an infectious disease caused by the dengue virus and transmitted through the bites of Aedes aegypti and Aedes albopictus mosquitoes [1]. These mosquitoes breed in water-filled habitats commonly found around human settlements. Indonesia is one of the countries with the highest number of DHF cases in the world [2], [3]. Globally, DHF is a significant health problem in many tropical and subtropical countries, including Southeast Asia, Latin America, and Africa. DHF has a substantial epidemiological impact, especially among children [4], [5]. The disease can cause widespread outbreaks and requires intensive prevention and control efforts. The high incidence and mortality rates of DHF highlight the need for increased awareness and effective preventive measures.

The main symptoms of DHF include sudden high fever, often reaching temperatures of 39°C or higher, severe joint and muscle pain, often referred to as “breakbone fever” due to its intensity, bleeding issues such as nosebleeds, bleeding gums, and the appearance of red spots on the skin (petechiae). A decrease in platelet count (thrombocytopenia) can lead to serious complications such as dengue shock syndrome [6], [7].

Platelets (thrombocytes) are blood cells that play a crucial role in the blood clotting process. When there is an injury or damage to blood vessels, platelets gather at the site and form a temporary plug to stop the bleeding. They also release chemicals that help strengthen this plug by forming fibrin, which is the main component of a stable blood clot. Low platelet levels, or thrombocytopenia, can lead to spontaneous bleeding, such as nosebleeds, bleeding gums, or even more serious internal bleeding [8]–[11]. In patients with DHF, platelet counts often drop drastically, especially during the critical phase of the disease, which is around the

third to fifth day after symptoms appear. This decrease in platelet count is caused by several factors, including the destruction of platelets by the dengue virus, reduced production of platelets in the bone marrow, and increased consumption of platelets due to blood vessel damage and bleeding [12], [13].

This disease has three main phases: the febrile phase, the critical phase, and the recovery phase. The first phase, the febrile phase, begins immediately after the viral infection. The main symptom is a sudden high fever, often exceeding 40°C. Other symptoms that may appear include muscle and joint pain, headache, nausea, vomiting, and the appearance of red spots on the skin. This phase usually lasts for 2-7 days [6], [14].

The second phase, the critical phase, typically occurs on the third to fifth day after the initial symptoms appear. During this phase, the fever may start to decrease, but the risk of complications increases. Common complications include plasma leakage, bleeding, and organ damage. Plasma leakage can lead to dangerous drops in blood pressure, while bleeding can occur in various organs.

The third phase, the recovery phase, follows the critical phase. During this phase, the fluids lost during the critical phase begin to return to the blood vessels, and the patient's condition gradually improves. However, monitoring is still necessary to ensure there are no further complications.

The third to fifth day is often considered the most critical period in the course of DHF. During this period, the risk of complications such as plasma leakage and bleeding increases. Therefore, close monitoring of vital signs and clinical symptoms is crucial during this time. During the critical phase, the platelet count in the blood often drops drastically. Platelets are blood components essential for the clotting process. Low platelet counts increase the risk of bleeding, which can become a serious complication. Therefore, routine monitoring of platelet counts is vital to anticipate and manage potential complications.

In this study, the platelet count profile in children diagnosed with DHF is identified, with a specific focus on changes in platelet count during the third to fifth days after the onset of symptoms. The aim of this research is to provide a deeper understanding of the dynamics of platelet count during the critical phase of DHF in children, which can aid in more effective patient monitoring and management. This study is crucial as it provides information on the pattern of platelet count changes as a critical clinical indicator for monitoring and managing children with DHF. Information on platelet count dynamics assists in daily patient monitoring, allowing healthcare professionals to identify significant changes that require immediate intervention.

METHOD

The research method applied is descriptive with a cross-sectional approach to examine the relationship between risk factors and their effects through an observational approach or data collection at a specific point in time [15]. This research was conducted retrospectively by reviewing the medical records of pediatric patients diagnosed with DHF at Hermina Arcamanik General Hospital from March 2024 to April 2024. Platelet counts were automatically measured using a hematology analyzer with a cell counting method known as volumetric impedance. The data obtained from the medical records were then analyzed and presented descriptively in data tabulations and narratives to summarize and illustrate the findings.

RESULT AND DISCUSSION

The subjects of this study are patients admitted to Hermina Arcamanik General Hospital with a diagnosis of DHF from March to April 2024. The data collected includes the results of platelet count examinations. Additionally, these examinations are based on two variables: age group and gender.

Table 1. Research subjects based on age and gender

Age	**Patient**	**Percentage (%)**
≤ 5	13	43
6 – 10	8	27
11 – 15	9	30
Total	**30**	**100**
Gender	**Patient**	**Percentage (%)**
Male	19	63
Female	11	37
Total	**30**	**100**

In Table 1, it was shown that the majority of children studied were aged ≤ 5 years, accounting for 43% of the total sample. Within this age group, most experienced DHF, indicating that this infection is more prevalent among very young children. Additionally, the data shows that the majority of DHF sufferers in this age group are male, with a percentage reaching 63%. These findings suggest that gender may play a role in the susceptibility to dengue fever infection, with males being more vulnerable than females in this age group.

Table 2. Platelet Counts of Children with DHF at Hermina Arcamanik General Hospital on the Third Day

Platelet (/mm^3)	**Patient**	**Percentage (%)**
Low (< 150.000)	30	100
Normal (150.000-400.000)	0	0

Total	**30**	**100**

In Table 2, it can be seen that on the third day of treatment for DHF patients at Hermina Arcamanik General Hospital, all 30 respondents involved (100%) showed a decrease in platelet count. This decrease in platelet count is a characteristic indicator of DHF and is often used to monitor disease progression and response to therapy. A significant drop in platelet count on the third day may indicate that the patient is in the critical phase of the disease, where the risk of complications increases. This data is crucial for planning appropriate medical interventions and providing suitable care to prevent further progression of the disease.

Table 3. Platelet Counts of Children with DHF at Hermina Arcamanik General Hospital on the Fourth Day

Platelet (/mm^3)	**Patient**	**Percentage (%)**
Low (< 150.000)	30	100
Normal (150.000-400.000)	0	0
Total	**30**	**100**

In Table 3, it is evident that on the fourth day of treatment for DHF at Hermina Arcamanik General Hospital, all 30 respondents (100%) still exhibited a decline in platelet counts. This continues the trend observed in previous days, indicating that the critical phase of DHF typically extends until the fourth day. The sustained decrease in platelet levels is a hallmark of dengue virus infection, with the critical phase often occurring between the third and fifth days after the onset of fever. This significant decline can increase the risk of bleeding or other serious complications if not properly managed. Therefore, close monitoring and appropriate medical interventions are crucial to prevent the patient's condition from worsening. These findings highlight the importance of intensive care during the critical phase of DHF.

Table 4. Platelet Counts of Children with DHF at Hermina Arcamanik General Hospital on the Fifth Day

Platelet (/mm^3)	**Patient**	**Percentage (%)**
Low (< 150.000)	28	93,3
Normal (150.000-400.000)	2	6,7
Total	**30**	**100**

In Table 4, on the fifth day of treatment for DHF at Hermina Arcamanik General Hospital, it is shown that 28 out of 30 respondents (93.3%) still experienced a decline in platelet counts. Although most patients showed continued platelet reduction, two of the 30 respondents (6.7%) did not exhibit further decline on the fifth day, which may indicate early recovery or stabilization of their condition. The ongoing decrease in platelet levels among the majority of

patients suggests that the critical phase of DHF is still active. However, after the fifth day, some patients may begin to enter the recovery phase. It remains essential to closely monitor patients during this period, as the risk of complications, such as severe bleeding, persists for those with low platelet counts. These findings emphasize the variability in individual responses to dengue infection and highlight the importance of personalized care based on the clinical progression of each patient.

Table 5. Platelet Counts of Children with DHF Based on Age and Gender

Platelet Counts						
Age	**Normal**		**Low**		**Total**	**Percentage (%)**
	Patient	**Percentage (%)**	**Patient**	**Percentage (%)**		
≤ 5	0	0%	13	46,4%	13	43%
6 – 10	0	0%	8	28,6%	8	27%
11 – 15	2	100%	7	25%	9	30%
Total	**2**	**100%**	**28**	**100%**	**30**	**100%**
Gender	**Normal**		**Low**		**Total**	**Percentage (%)**
	Patient	**Percentage (%)**	**Patient**	**Percentage (%)**		
Male	1	50%	18	64,3%	19	63%
Female	1	50%	10	35,7%	11	37%
Total	**2**	**100%**	**28**	**100%**	**30**	**100%**

Table 5 shows that the majority of DHF patients at Hermina Arcamanik General Hospital are children aged ≤ 5 years, with 13 respondents, representing 46.4% of the total sample. This confirms that young children are at higher risk of contracting dengue infection, potentially due to an underdeveloped immune system or greater environmental exposure.

Additionally, Table 5 reveals that, based on gender, males are more dominant among DHF patients, with 18 respondents or 64.3% of the total sample. This data suggests a gender difference in the prevalence of dengue infection, with males appearing to be more susceptible to the disease. Factors such as behavior, more frequent outdoor activities, or potential biological differences may contribute to this disparity.

Table 6. Platelet Counts of Children with DHF on the Third Day

	Patient	Minimum	Maximum	Mean
Platelet count	30	19.000	69.000	45.400
Valid N (Listwise)	30			

Table 6 shows that all 30 children (100%) with DHF at Hermina Arcamanik General Hospital experienced a decrease in platelet counts during treatment, particularly on the third day of fever. Platelet reduction is a common symptom of DHF, which increases the risk of complications such as bleeding. The lowest platelet count recorded was 19,000/mm³, which is critically low and far below the normal range (approximately 150,000–450,000/mm³), indicating the critical phase. Meanwhile, the highest platelet count was 69,000/mm³, which, although higher than the minimum, is still significantly below the normal range.

The average platelet count among hospitalized patients was 45,400/mm³, which falls within the low category, indicating that most patients remained vulnerable to complications from thrombocytopenia. The third day of fever is often regarded as a critical period in the progression of DHF, where a drop in platelet count serves as a key indicator for monitoring the patient's condition and determining necessary medical interventions. These findings highlight the importance of close monitoring during this phase to prevent severe complications, such as dengue shock syndrome or internal bleeding.

Table 7. Platelet Counts of Children with DHF on the Fourth Day

	Patient	Minimum	Maximum	Mean
Platelet count	30	35.000	155.000	85.770
Valid N (Listwise)	30			

Table 7 shows that on the fourth day of treatment, all 30 children (100%) with DHF at Hermina Arcamanik General Hospital still experienced a decline in platelet counts. The lowest platelet count recorded was 35,000/mm³, which, although slightly higher than the lowest values from previous days, still indicates that the patients were in the critical phase of DHF. Meanwhile, the highest platelet count was 155,000/mm³, nearing the lower limit of the normal range (approximately 150,000/mm³).

The average platelet count on the fourth day of fever was 85,770/mm³, showing slight improvement compared to previous days but still below the normal threshold. This suggests that some patients may be starting to recover, but close monitoring remains essential, as the risk of complications such as bleeding or dengue shock syndrome persists until platelet levels consistently return to normal.

These findings emphasize the importance of this critical recovery phase on the fourth day, where intensive medical supervision is required to prevent severe complications and ensure a smooth recovery process.

Table 8. Platelet Counts of Children with DHF on the Fifth Day

	Patient	Minimum	Maximum	Mean
Platelet count	30	26.000	112.000	56.800
Valid N (Listwise)	30			

Table 8 shows that on the fifth day of treatment for children with DHF at Hermina Arcamanik General Hospital, 28 out of 30 respondents (93.3%) still experienced a decline in platelet counts. Although most patients continued to suffer from thrombocytopenia (low platelet count), two patients (6.7%) may have started showing signs of recovery.

The lowest recorded platelet count was 26,000/mm³, indicating that the patient remained in a critical condition with a high risk of bleeding. Meanwhile, the highest platelet count was 112,000/mm³, which is close to the lower limit of the normal range (around 150,000/mm³) but still considered low.

The average platelet count on the fifth day of fever was 56,880/mm³, reflecting some improvement from earlier phases, though most patients remained in need of intensive monitoring. The fifth day of fever is often a decisive point in determining whether the patient is entering the recovery phase or still in the critical phase. Therefore, it is essential to ensure proper medical management to help patients recover gradually without serious complications.

CONCLUSION

Based on the presented data, it can be concluded that children under the age of five are the most vulnerable group to DHF infection. Additionally, males appear to be more frequently infected than females, although the exact reasons for this require further investigation.

The progression of platelet counts in patients indicates that a significant decline occurs between the third and fifth days of fever, with some patients beginning to show signs of recovery on the fourth and fifth days. However, the majority of patients still experienced severe thrombocytopenia during this period, requiring intensive monitoring and appropriate medical intervention to prevent serious complications.

Clinically, these findings highlight the importance of close monitoring during the critical phase of DHF, particularly concerning platelet levels. Early detection and proper management during this phase are crucial to ensure patient safety and prevent potentially fatal complications.

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