

Relationship between Nutritional Status and Lymphocyte Count in Children with Dengue Fever at Dr. Pirngadi Regional Hospital, Medan

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Article Info	ABSTRACT
Keywords:	Dengue Hemorrhagic Fever (DHF) is an infectious disease caused by
Dengue Hemorrhagic Fever,	the dengue virus and transmitted through the bite of the Aedes aegypti
Lymphocyte Nutritional Status,	mosquito. Nutritional status is thought to play a role in the body's
Children,	immune response to infection, including in regulating the number of
Dr. Pringadi Hospital, Medan	lymphocytes that play a role in the immune system. However, the
	relationship between nutritional status and lymphocyte count in children
	with DHF still needs further study. This study aims to analyze the
	relationship between nutritional status and lymphocyte count in children
	with DHF at Dr. Pirngadi Hospital, Medan. This study used a cross-
	sectional design with secondary data from medical records of pediatric
	patients with DHF at Dr. Pirngadi Hospital, Medan for the period 2021-
	2022. The study sample was selected using the consecutive sampling
	method with a total of 35 samples. Data analysis was carried out using
	the Chi-Square test to determine the relationship between nutritional
	status and lymphocyte count. The majority of study subjects had normal
	nutritional status (80%), while 14.3% were malnourished and 5.7%
	were overweight. Most subjects had lymphocytosis (77.1%), while 20%
	had normal lymphocyte counts, and 2.9% had lymphocytopenia.
	Bivariate analysis showed a significant relationship between nutritional
	status and lymphocyte count (p=0.010).There is a significant
	relationship between nutritional status and lymphocyte count in children
	with DHF at Dr. Pirngadi Medan Regional Hospital. Children with
	malnutrition tend to have lower lymphocyte counts than children with
	normal or more nutrition.
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INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a disease caused by dengue virus infection (DENV), which consists of four main serotypes and is transmitted through the bite of Aedes aegypti and Aedes albopictus mosquitoes. This disease is mainly endemic in tropical and subtropical areas, including Indonesia, and has experienced an increase in cases globally. WHO recorded a spike in cases from 505,430 in 2000 to 5.2 million in 2019, with around 3.9 billion people

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worldwide at risk of infection. In Indonesia, cases of DHF are still high, with North Sumatra, especially Medan City, being one of the areas significantly affected.

In addition to environmental factors and mosquito vectors, nutritional status also plays a role in the risk and severity of dengue fever. Malnutrition and obesity can affect the immune system, increasing susceptibility to infection. Children with obesity have a higher risk of developing severe dengue fever due to increased inflammatory substances, while children with malnutrition tend to have weaker immunity. Several studies have shown a relationship between nutritional status and the number of lymphocytes in dengue patients, where low lymphocyte counts can worsen the patient's condition.

Based on a survey at Dr. Pirngadi Medan Regional Hospital, 98 cases of DHF in children were recorded in the period 2021-2022. Given the importance of nutritional status in the immune system, this study aims to analyze the relationship between nutritional status and the number of lymphocytes in children with DHF at the hospital. The results of this study are expected to provide insight into more effective DHF prevention and treatment efforts.

METHODS

This study used a cross-sectional design with secondary data from medical records of pediatric patients with Dengue Hemorrhagic Fever (DHF) at Dr. Pirngadi Medan Hospital for the period 2021–2022. The study sample was selected using the consecutive sampling method, with a total of 35 samples. The study subjects were taken from a population that met the inclusion criteria, namely children aged 5–15 years of both sexes who underwent laboratory diagnostic examinations for DHF, including complete blood counts, and had medical records containing complete blood count results, especially lymphocyte counts, and anthropometric data such as height and weight. Subjects were excluded if they were diagnosed with DHF but had comorbidities such as typhoid fever, respiratory tract infections, chronic kidney failure, or malaria, or if their medical records were incomplete or did not have data on height, weight, and lymphocyte counts.

Data analysis was performed using univariate and bivariate analysis. Univariate analysis was used to see the frequency distribution and characteristics of variables, including gender, nutritional status, severity of DHF, and lymphocyte count in children with Dengue Hemorrhagic Fever (DHF) at Dr. Pirngadi Medan Regional Hospital. Meanwhile, bivariate analysis aims to identify the relationship between nutritional status and lymphocyte count in children with DHF. This analysis was performed using the Chi-Square test with a significance level of 0.05 to determine the relationship between nutritional status and lymphocyte count. This study has obtained ethical eligibility from the HKBP Nommensen University Health Research Ethics Commission Team with number 758/KEPK/FK/IX/2024.

RESULTS AND DISCUSSION

The study was conducted in October - November 2024. In this study, 98 medical records were obtained that met the inclusion criteria, there were 63 medical records that were excluded so that the sample in this study amounted to 35 medical records. Table 1 shows the distribution of respondents by gender. Of the total 35 respondents, 15 people (42.9%) were



male, while 20 people (57.1%) were female. With this proportion, the majority of respondents in this study were female. This shows that women are more dominant in the sample taken for this study.

Table 2 shows the description of the frequency of respondents based on nutritional status. Of the total 35 respondents, the majority had normal nutritional status, which was 28 people (80%). Respondents with poor nutritional status numbered 5 people (14.3%), while respondents with excess nutritional status were only 2 people (5.7%). These data indicate that only the majority of research subjects had nutritional status that was in the normal category.

Table 3 illustrates the distribution of respondents based on the severity of Dengue Hemorrhagic Fever (DHF). The majority of respondents experienced grade 2 DHF, which was 24 people (68.6%). A total of 10 people (28.6%) were in the grade 1 DHF category, while only 1 person (2.9%) experienced grade 3 DHF. These results indicate that most of the study subjects were in the moderate severity category (grade 2), with a relatively small number in the most severe category (grade 3). Table 4 shows the frequency distribution of lymphocyte counts in the study samples. The results indicate that the majority of subjects (77.1%) had lymphocytosis, followed by normal conditions (20%) and lymphocytopenia (2.9%).

The results of this study indicate a significant relationship between nutritional status and lymphocyte count in children with Dengue Hemorrhagic Fever (DHF). Data analysis indicates that nutritional status affects the number of lymphocytes in pediatric patients with DHF. Children with normal nutritional status and high nutritional status tend to experience lymphocytosis, while children with poor nutritional status show more normal lymphocyte values. These findings strengthen the hypothesis that nutritional factors play an important role in the body's immune response to DHF infection.

Table 1. Description of Subject Frequency Based on Gender			
Respondent Characteristics	Frequency	Percentage (%)	
Gender			
Man	15	42.9%	
Woman	20	57.1%	
Total	35	100%	

I able 1. Description of Subject Frequency Based on Gender			
Respondent Characteristics	Frequency	Percentage (%)	
Gender			
Man	15	42.9%	

Table 2 Description	of Subject Frequ	iency Based on	Nutritional Status
		JEIICY Dased OII	Nutritional Status

Nutritional status	Amount	Percentage (%)
More Nutrition	2	5.7%
Normal Nutrition	28	80%
Malnutrition	5	14.3%
Total	35	100%

Table 3. Description of Subject Frequency Based on Dengue Fever Severity Level

Ľ	Degree of DBD	Amount	Percentage (%)
	Degree 1	10	28.6%
	Degree 2	24	68.6%

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Degree of DBD	Amount	Percentage (%)
Degree 3	1	2.9%
Grade 4	0	0%
Total	35	100%

Table 4.Subject Frequency Description Based on Lymphocyte Levels

Lymphocyte Levels	Amount	Percentage (%)
Lymphocytosis	27	77.1%
Normal	7	20%
Lymphocytopenia	1	2.9%
Total	35	100%

CONCLUSION

Based on the findings and discussion in this study, it can be concluded that there is a significant relationship between nutritional status and the number of lymphocytes in children infected with dengue fever, with a P value of 0.010 (<0.05).

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