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Original Research Paper

Parasitology

CORRELATION BETWEEN PLATELET LEVEL AND SEROLOGICAL RESULTS IN DENGUE PATIENTS

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ABSTRACT

Summary. Some regions in Indonesia, including Medan, North Sumatra, are endemic areas of dengue fever. According to a report from the Dinkes Provsu, there were 15 death caused by dengue in 2014. After fever, most patients usually experience thrombocytopenia which increases the risk of bleeding and complications.

Objectives. This study aims to look at the correlation between platelet levels and serological results in dengue patients at USU Hospital.

Material and methods. After gathering ethical clearance, blood samples were taken to the subjects. The selected subjects were tested for platelet using the Sysmex XT-2000i with impedance method. NS1 examination was performed using the Dengue NS1 Ag Kit Bio Line, while for IgM and IgG were performed with the Dengue IgG / IgM test Smart Diagnostic. Data analysis with independent t test.

Result. This study gathered that there was a correlation between platelet levels and IgM serological results (p = 0.034) and IgG (p = 0.0049) in dengue patients at USU Hospital, but correlation was found between platelet levels and NS1 (p = 1.000).

KEYWORDS :

BACKGROUND

Dengue infection is a disease that is transmitted through mosquito bites and can spread quickly [1]. More than 500,000 cases are hospitalized and more than 20,000 death caused by dengue occur every year [2]. One study states that dengue virus can trigger spinal cord suppression which causes a decrease in platelet synthesis resulting in thrombocytopenia [3]. Another study mentions that thrombocytopenia can also occur due to the increase of platelet destruction [4]. Reversible and life-threatening dengue vascular complications are concerned with severe thrombocytopenia and the increase of vascular permeability [5]. The risk of bleeding and complications is a result of thrombocytopenia in patients [6]. As one of the (DBD) endemic areas, there were 1,699 cases of (DBD) with 15 cases of deaths in Medan in 2014 [7]. Groups of 5-14 years old female are the largest dengue cases prevalence [8]. This study aims to see whether there is a correlation between platelet levels and serological results in (DBD) patients in USU Hospital.

MATERIAL AND METHODS

This study was conducted on patients who came to the USU Hospital from March to May 2018. After obtaining ethical clearance, sampling was taken on the research subjects who had filled out informed concern by purposive sampling. The selected subjects were tested for platelets, MPV and PDW using the Sysmex XT-2000i impedance method. NS1 examination was performed using the Dengue NS1 Ag Kit Bio Line, while for IgM and IgG were performed with the Dengue IgG / IgM test Smart Diagnostic. Data analysis with independent t test.

RESULTS

This study obtained the results of 23 DBD patients who met the inclusion criteria. Male patients were more than females by 52.17% (table 1)

Table 1. Patient Characteristic

Age (year)	Male		Female	
	n	%	n	%
<18	3	13.04	2	8.70
>18	9	39.13	9	39.13
Total	12	52.17	11	47.83

Based on t independent test, there was no correlation between platelet level with NS1 (p = 1,000). But results of this study showed a correlation between platelet levels with IgM (p = 0.0340) and IgG (p = 0.0049).

Table 2. Correlation between platelet and serology test

No.	Parameter	Platelet		p-value*
		Mean	SD	
1.	NS1	69.4 x 103 182 x 103	26.8 x 103 16.7 x 103	1.000
2.	IgM	117 x 103 76.4 x 103	69.8 x 103 28.5 x 103	0.034
3.	IgG	146,2 x 103 79.4 x 103	69.4 x 103 42.1 x 103	0.0049*

*p<0.05

DISCUSSIONS

Differ with Depkes RI report in 2008 that states the highest prevalence of DBD cases in the age group of 5-14 years and the most gender is women, this study obtained results that DBD patients generally aged >18 years and male gender [8]. This difference is likely because men >18 years of age have more outside activities than women.

The mean platelet value for each positive parameter in this study was NS1 (182x103 ± 16.7 x 103µL), IgM (76.4 x 103 ± 28.5 x 103), and IgG (79.4 x 103 ± 42.1 x 103). Platelet destruction caused by the binding of specific dengue antibodies to infected platelets can cause thrombocytopenia in DBD or SSD patients. Besides, thrombocytopenia can also be caused by direct platelets destruction by virus (direct cytotoxicity). Another thing that might also happen is that platelets can act as a place for dengue virus replication but this issue still needs further research [9].

Prayoga (2017) reported a correlation between platelet counts and the positive results of NS1 examination (p = 0.031) [10]. This report is different from this study which found a correlation between platelet levels and positive results of NS1 examination (p = 1.000). This difference might be caused by the sample number in this study was

less than thirty. In line with Jacob's statement (2014) that the pattern of patients' platelet counts pattern with secondary types of infection (IgG and IgM positive) tends to continue to increase with the lowest level on day 5 (68,833 / mm3), this study obtained results in a correlation between platelet levels and positive results IgM (p = 0.0340) and IgG (p = 0.0049) [11].

CONCLUSIONS

This study found that there was a correlation between platelet levels with IgM (p = 0.034) and IgG (p = 0.0049) but no correlation between platelet levels and NS1 (p = 1.000).

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