Early Warning Score System (EWSS) and Length of Stay Patients with Dengue Hemmoragic Fever

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Keywords: Dengue Hemorragic Patient, Early Warning Score System, Length of Stay.

Abstract: Dengue hemorrhagic fever is a disease from dengue virus accompanied by bleeding and shock. Early Warning Score System may help nurses to predict that risk of critical condition based on vital's sign result. This study was analize the relationshipbetween EWSS Agregate value and the length of stay in DHF patients. This study used observational design with retrospective cohort approach. The population in this study were DHF patients. The sample were 100 DHF's patients, used probability sampling technique with simple random sampling approach. The instrument on this study used observational paper of EWSS form, analized by Spearman rho test. The result shows the most EWSS aggregate value is low risk (91,9%) whereas the length of stay is in category medium stay (73%). Spearman rho test showed that there was relationship between early warning score aggregate value with length of stay in DHF patient with $\rho = 0.002$ ($\rho \leq \alpha = 0.05$) and the correlation coefficient 0,590 ($r \leq 0{,}1000$). Implications of the results shows that the EWSS Agregate value have a relationship with length of stay in DHF patient. Moreover this study can predict the length of stay DHF patients when they are got an EWSS aggregate value to improve Quality of care in hospital.

1 BACKGROUND

Dengue Hemorrhagic Fever (DHF) is an infectious disease that occurs in tropical area frequently. It cause by dengue viruses spread out by Aedes Aegypti mosquitoes, and its accompanied by bleeding manifestations which is tends to cause shock and death (Misnidiarly 2009; Hikmah and Moroni 2015).

Treatment and nursing care of DHF patients will takes time and intensively care. It refers with increases of vascular's permeability membrane, leading to decreased platelets and plasma leakage. The risk of bleeding or shock, regarding with decreased of platelet's level will impact on the worsening the condition itself. Furthermore, Early Warning Score System (EWSS) is an appropriate observation tool to identify the risk of critical condition in patients or patients at risk of death in hospital (Burch et al. 2008). More higher the score it will reflected the condition getting worse or critical. Critical condition of patients, will impact on the length of their stay in the hospital in order to get treatment instensively. Some studies were carried out on the benefit of Early Warning score system in order to detect the critical condition. However, the agregate's score of EWSS related with the lenght of DHF's patients stay is still underutilized.

The World Health Organization (WHO) describes cases of dengue fever in worldwide around 50-100 million annually, with 250,000-500,000 cases and 24,000 deaths per year. Ministry of Health of Republic Indonesia stated until 28 August 2014 the number of DHF patients is 48,905 cases with 376 deaths. (Astuti 2016). Meanwhile, in Dr. Ramelan Hospital, one of the biggest hospital in East Java Indonesia, the number of dengue patients in 2016 around 257 patients with the average length of the day hospitalization in range 3-14 days.

In the study conducted by (Siregar 2010) reported that the average length of treatment of DHF patients is a minimum of two days while the longest is 9 days based on platelet count. Previous study reported that Early Warning Score over 4 in the first assessment then the patient would get longer treatment than patients who in the initial assessment received a 0-3 EWS score that only took 48 hours of treatment. Positive results on better clinical outcomes were obtained after introduction of EWS charts in patients with acute conditions (Alam 2014). This suggests that EWS can help accelerate the improvement of the patient's condition by observing through the resulting

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EWS score and reducing the length of patient's day in hospital, through recognizing signs of worsening condition.

By Identification of abnormal clinical signs as well as patient health history, and appropriate diagnostic test were tends to predict the risk of adverse outcomes objectively (Burch et al. 2008). However, the deterioration of these clinical signs is often unclear and may occur unnoticed. Furthermore, the development and availability of tools that can described the evidence of clinical deterioration are essential. Ultimately, this can prevent adverse events and improve the patient's condition (Alam 2014).

Early warning score (EWS) is a scoring system used to help detect early deterioration of the patient's condition and reduce unexpected events in the clinical ward associated with the patient's condition (Smith 2012). EWS will help the health worker to identify the emergency situation in the patients which can then be handled from the beginning, so the hospitalization time will be much faster because the patient gets the treatment well and can help improve the hospital service quality. This socialization needs to be done in order to improve the implementation of early warning score on inpatient patients especially in patients with critical condition so that the achievement of patient satisfaction and staff who do the maintenance.

Researchers want to analyze the relationship of early warning score system with length of stay dengue hemorrhagic patients in inpatient wards of the disease based on the above background. Dengue Hemorrhagic Fever (DHF) is an infectious disease that occurs in tropical area frequently. It cause by dengue viruses spread out by Aedes Aegypti mosquitoes, and its accompanied by bleeding manifestations which is tends to cause shock and death(Misnidiarly 2009; Hikmah and Moroni 2015).

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Researchers want to analyze the relationship of early warning score system with length of stay dengue hemorrhagic patients in inpatient wards Dr. Ramelan Hospital Surabaya.

2 METHODS

This study uses obeservational design with a retrospective cohort approach. The sample in this study were DHF patients in in-patient wards of Dr. Ramelan Surabaya, which amounted to 100 patients using probability sampling technique with simple random sampling approach. The independent variable is the aggregate value of early warning scored and the dependent variable is the length of patient care of DHF. In demographic data the instrument used is an observation sheet filled by researchers consisting of gender, age, Occupation, date of admissin, date of discharge, and EWS score. Meanwhile, the observations sheet of EWS aggregate scores and observation of length of day care using day. The data used secondary data in the medical record of the EWS score.Data analysis techniques is Spearman rho test showed that there was relationship between early warning score aggregate value with length of stay in DHF patient with $\rho = 0.002$ ($\rho \leq \alpha = 0.05$) and the correlation coefficient 0,590 ($r \leq 0,1000$).) The length of their stay, based on the day the patient first entered the treatment room until return home. The hypothesis in this study is that there is an association Early Warning Score with the length of day treatment of DHF patients in the Inpatient Room Dr.Ramelan Surabaya.

3 RESULTS

Table 1: Aggregate Value of Early Warning Score System DHF patients in inpatient Ward Dr.Ramelan Surabaya (n=100).

EWSS aggregate value	Frekuency (f)	Percentage (%)
Low	92	92%
Medium	8	8%
High	0	0%
Total	100	100%

Based on table 1, 100 respondents had aggregate value of EWSS with a low score (92%), and moderate score (8%). Table 2 showed that from 100 respondents, there were 16 respondents (16%) short stay, 73 respondents (73%) médium stay, and 11% respondents were long stay.

Table 2: Lenght of stay DHF patients in inpatient Ward Dr.Ramelan Surabaya (n=100).

Lenght of Stay	Frekuency (f)	Percentage (%)
Short Stay (≤ 3 days)	16	16 %
Medium Stay (4-11 days)	73	73%
Long Stay (≥ 12 days)	11	11 %
Total	100	100%

Table 3: Spearman's rho test of The relationship between EWSS agregate value and the lenght of stay DHF patientsin Inpatient ward Dr. Ramelan Surabaya (n = 100).

Agregate value EWSS	Lenght of Stay			Total
	Short stay (1-3 days)	*Medium stay* (4-11 days)	*Long stay* (≥12 days)	
Low (0, 1-4)	16 16%	73 73%	3 3%	92 92%
Medium (5-6)	0 0%	0 0%	8 8%	8 8%
Total	16 16%	73 73%	11 11%	100 100%
Spearman Rho test $\rho = 0.002$				
Correlation Coefficient = 0,590				

In this study, the amount of respondents with EWSS aggregate value and the length of stay of DHF patients in Dr.Ramelan Surabaya, there were low EWSS value and short stay (16%), medium stay (73%), and long stay (3%) respondents. Whereas 8% respondents with EWSS médium value (8%) have long stay care. According to Spearman statistic test results obtained ρ less than α,ρ=0,002 < α = 0,05, which means that there is a statistically relationship between the EWSS agregate value with the length of stay patient with DBD in Dr. Ramelan Surabaya. Then from the results of Correlation Coefficient showed the results of 0.590 which refers to the closeness of the relationship between the aggregate value of EWSS with the length of stayin a medium context.

4 DISCUSSION

4.1 Aggregate Value Early Warning Score System DHF Patients in Inpatient Room Dr. Ramelan Surabaya

Results of this research, reported that in general DHF patients in inpatient Ward, generally have low aggregate EWSS value as much as 92 respondents (92%). Low EWSS values can be affected by several factors including the age, the severity of the disease, and gender. Majority DHF's patients were in range 17-25 years. In this period, one's body is able to compensate well in ill condition. It assumed the value obtained influenced by the patient's clinical condition which is showed by the increases of body temperature, the pulse and the presence of the respondent using the additional oxygen therapy (nasal canule). Any change in the EWSS component can be an indicator of physiological changes due to the degree of DHF condition. Increased body temperature is a mechanism of the dengue virus inflammation in patients with DHF. Patients may develop to shock dengue fever if the score are increased such as pulse and blood pressure, acral (tip) cold extremities, accompanied by skin congestion. These changes show symptoms of circulatory disorders, as a result of mild or severity of plasma infiltration (Nopianto 2012). Furthermore, the score will add with 2 point if the patients supported by oxygen therapy (Physicians Royal College 2012).

4.2 Lenght of Stay DHF Patient in Inpatient Ward Dr. Ramelan Surabaya

The results obtained that 73% have a medium stay (4-11 days). It means, DHF cases were in moderate treatment, varies depend on their clinical manifestations and the role of healh care personnel during the treatment. Patients with DHF is highly potential for bleeding due to changes in homeostasis in the body caused by Dengue virus (Soedarto 2012). We assumed that the length of the day of care related with health's history of patients and their physical condition to adapt and recover. Vital's sign data obtained in average, their respiration rate is 20 times per minute, pulse rate 92 time per minute and 37 degree celcius for the body temperature.

Surprisingly, there were 3 (three) female respondents on long stay (>12 days). It was argue that it was related with the anatomy of capillary permeability in female patients. Kasper DL et al (2009) cited(Nopianto 2012)mention that in female, the clinical manifestation dengue fever is more severe rather tan in men. It related with the capillary walls in women tend to increase rather than in men anatomically.

4.3 Relationship Between Aggregate Value Early Warning Score System and Length of Stay Dengue Hemmoragic Patients in Dr. Ramelan Surabaya

In this research, it was found that there was significantly relationship between EWSS aggregate value and the length of stay patient with DHF and also the closeness relation both variable was in moderate relationship. It was appropriate with the theories that more higher the aggregate value will impact the worsening condition. The treatment and nursing care will depend on the necessity of body requirements focused on the leakage of plasma into extravascular space. It was a risk for severe bleeding such as petechia, epistaxis, bleeding in gums as well as hemoptisis.

5 CONCLUSIONS

The EWSS aggregate value of DHF patients have relationship with their lenght of stay during hospitalization. It was recomended to measure the EWSS aggregate value in the first and continued assesment in order to identify the condition of patients as well as to identify the appropriate treatment and the quality of nursing care.

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