Open Access Indonesian Journal of Medical Reviews

Journal Homepage: https://hmpublisher.com/index.php/OAIJMR

Apache II Score as a Predictor of Mortality and Length of Treatment for Generalized Peritonitis Patients at Dr. Kariadi General Hospital Semarang Indonesia

Boni Aditia Ginting[1*], Bernardus Parish Budiono[2]

[1]Department of Surgery, Faculty of Medicine, Universitas Diponegoro/Dr. Kariadi General Hospital, Semarang, Indonesia

[2]Department of Digestive Surgery, Faculty of Medicine, Universitas Diponegoro/Dr. Kariadi General Hospital, Semarang, Indonesia

ARTICLE INFO

Keywords:
APACHE II
Peritonitis
Mortality
Length of treatment

***Corresponding author:**
Boni Aditia Ginting

E-mail address:
gintingboni87@gmail.com

All authors have reviewed and approved the final version of the manuscript.

https://doi.org/10.37275/oaijmr.v2i6.236

A B S T R A C T

Peritonitis can cause sepsis and septic shock, which can lead to death. The existence of a prognostic assessment to assess the progression of cases of peritonitis becomes urgent. This is due to the fact that peritonitis progresses very quickly, and delays in treatment and action will cause the patient's death. This study is a preliminary study with the aim of assessing the potential for developing the APACHE II score as a predictor of mortality in generalized peritonitis patients at Dr. Kariadi General Hospital Semarang Indonesia. This study is an observational study with as many as 22 research subjects, peritonitis patients at Dr. Kariadi General Hospital Semarang Indonesia. Univariate and bivariate analysis was conducted to determine the relationship between APACHE II score with mortality and length of treatment. The results of the study showed that the APACHE II score was positively correlated with moderate strength and statistically significant to the mortality of generalized peritonitis patients. APACHE II score is able to predict mortality but is not able to predict the length of treatment for generalized peritonitis patients at Dr. Kariadi General Hospital Semarang Indonesia.

1. Introduction

Peritonitis is the most common abdominal emergency. Peritonitis can cause sepsis and septic shock, which can result in death.[1] A prospective study of 11,200 peritonitis patients found that 11% of peritonitis patients had sepsis, of which 24% of patients with sepsis progressed to multi-organ failure, with a mortality rate of 6%.[2] Age, comorbid cardiovascular diseases, kidney disorders, liver disorders, and late treatment > 24 hours are factors that affect mortality. Many scoring methods are used for prognostic and surgical decision-making. One of the prognostic methods used is the acute physiology and chronic health evaluation score (APACHE II).[3] The APACHE II score assesses changes in the body's physiological functions through several assessment items, which will then be calculated into certain numbers and scores. Several studies have shown the potential of the APACHE II score as a prognostic value for determining mortality and length of treatment in peritonitis patients.[4]

The existence of a prognostic assessment to assess the progression of cases of peritonitis becomes urgent. This is due to the fact that peritonitis progresses very quickly, and delays in treatment and action will cause

the patient's death.[5] This study is a preliminary study with the aim of assessing the potential development of the APACHE II score as a predictor of mortality in generalized peritonitis patients at Dr. Kariadi General Hospital Semarang Indonesia.

2. Methods

This study is a descriptive observational study with a case series approach to assessing the correlation of the APACHE II score on mortality and length of treatment at Dr. Kariadi General Hospital Semarang, Indonesia. A total of 22 peritonitis patients were treated at Dr. Kariadi General Hospital Semarang Indonesia in the period October 2019 – October 2021. The study subjects met the inclusion criteria, namely: male and female patients diagnosed with hollow viscus perforated peritonitis and male and female patients aged > 15 years. This study has been approved by the medical and health research ethics committee of Dr. Kariadi General Hospital Semarang Indonesia.

This study seeks to assess the correlation between APACHE II scores and generalized patient mortality and assess the correlation between APACHE II scores and length of treatment in generalized peritonitis patients. Data analysis was carried out with the help of SPSS version 25. Univariate analysis was carried out to present the frequency distribution of the study variables. Bivariate analysis was conducted to assess the correlation between APACHE II scores with mortality and length of treatment of generalized peritonitis patients using the Spearman correlation test with a p-value <0.05.

3. Results and Discussion

Table 1 shows the age of the majority of the study subjects, more than 60 years. The study subjects showed that the majority were male, with the majority of APACHE II scores of 6-10 and the majority of the perforation locations in the stomach/duodenum. Table 2 shows the correlation between the APACHE II score with mortality and length of treatment. APACHE II score was positively correlated with moderate strength and statistically significant to the mortality of generalized peritonitis patients. The higher the APACHE II score is in line with the increased prediction of mortality in generalized peritonitis patients. Length of treatment did not correlate with the APACHE II score.

Table 1. Baseline characteristics of research subjects

Variable	Frequency	Percentage (%)
Age		
<45 years	3	13.6
46 – 60 years	7	31.8
>60 years	12	54.6
Gender		
Male	16	72.7
Female	6	27.3
APACHE II Score		
0-5	4	18.8
6-10	12	54.4
11-15	4	18.8
16-20	0	0
>20	2	9
Mortality		
Life	14	63.6
Died	8	36.4
Length of treatment		
0-7 days	6	27.3
8-14 days	11	50
>14 days	5	22.7
Perforation location		
Gastric/duodenal	15	68.2
Appendix	3	13.6
Others	4	18.2

Table 2. Correlation test between variables

	Mortality	
	r	p
APACHE II	0.662	0.002
	Length of treatment	
	r	p
APACHE II	0.320	0.146

*Spearman's test, p=0.05

The study showed that the age with the most incidence of peritonitis was over 60 years of age. This is in accordance with the study, which states that age is one of the factors that affect the mortality of peritonitis patients.[6,7] The study showed that five of the eight patients who died were over 60 years old.[8-10] Age over 60 years is associated with a decrease in the body's physiological performance in dealing with various infections and inflammation caused by peritonitis. Another study showed that older people are 4.1 times more likely to have intra-abdominal infections than young people.[11-13]

This study shows a significant relationship between the APACHE II score and mortality. This result is in accordance with the study, which stated that patients who were able to survive were the group of patients with a low APACHE II score with an average score of eight, while patients who died had an average APACHE II score of 22.4. The higher the APACHE II score, the more severe the physiological damage that occurs so that the APACHE II value can predict mortality.[14,15]

4. Conclusion

APACHE II scores are able to predict mortality but are not able to predict the length of treatment for generalized peritonitis patients at Dr. Kariadi General Hospital Semarang Indonesia.

5. References

1. Godinjak A, Iglica A, Rama A, Tančica I, Jusufović S, et al. Predictive value of SAPS II and APACHE II scoring systems for patient outcome in a medical intensive care unit. Acta Med Acad. 2016; 45:97-103.
2. Ahuja A, Pal R. Prognostic scoring indicator in evaluation of clinical outcome in intestinal perforations. J Clin Diagn Res. 2013; 7:1953-5.
3. Tung CS, Sun CC, Schlumbrecht MP, Meyer LA, Bodurka DC. Survival after intestinal perforation: can it be predicted?. Gynecol Oncol. 2009; 115:349-53.
4. Ishikawa D, Takehara Y, Takata A, Takamura K, Sato H. Combination of dirty mass volume and APACHE II score predicts mortality in patients with colorectal perforation. World J Emerg Surg. 2021; 16:17.
5. Munghate A, Kumar A, Mittal S, Singh H, Sharma J. Acute physiological and chronic health evaluation II score and its correlation with three surgical strategies for management of ileal perforations. J Surg Tech Case Rep. 2015; 7:32-6.
6. Knaus WA, Draper EA, Wagner DP, Zimmerman JE. APACHE II: a severity of disease classification system. Crit Care Med. 1985; 13:818-29.
7. Kitara DL, Kakande I, Mugisa BD. POSSUM scoring system in patients undergoing laparotomy in Mulago Hospital. East Central Afr J Surg. 2007; 12:133-42.
8. Huttunen R, Kairaluoma MI, Mokka RE, Larmi TK. Nontraumatic perforations of the small intestine. Surgery. 1977; 81:184-8.
9. Afridi SP, Malik F, Ur-Rahman S, Shamim S, Samo KA. Spectrum of perforation peritonitis in Pakistan: 300 cases eastern experience. World J Emerg Surg. 2008; 3:31.
10. Dorairajan LN, Gupta S, Deo SV, Chumber S, Sharma L. Peritonitis in India--a decade's experience. Trop Gastroenterol. 1995; 16:33-

8.
11. Khan PS, Dar LA, Hayat H. Predictors of mortality and morbidity in peritonitis in a developing country. Ulus Cerrahi Derg. 2013; 29:124-30.
12. Kannan A, Ravichandran M, Sundaramurthi S, et al. Is single-dose antimicrobial prophylaxis sufficient to control infections in gastrointestinal oncological surgeries?. Cureus. 2021; 13:e16939.
13. Bohnen J, Boulanger M, Meakins JL, McLean AP. Prognosis in generalized peritonitis. Relation to cause and risk factors. Arch Surg. 1983; 118:285-90.
14. Adesunkanmi AR, Ajao OG. The prognostic factors in typhoid ileal perforation: a prospective study of 50 patients. J R Coll Surg Edinb. 1997; 42:395-9.
15. Kulkarni SV, Naik AS, Subramanian N Jr. APACHE-II scoring system in perforative peritonitis. Am J Surg. 2007; 194:549-52.