

Aspartate Aminotransferase to Platelet Ratio Index Profile of Cirrhotic Patients with Positive HBsAg

Nadya Husni¹, Leonita Anniwati^{2*}, Lina Lukitasari³

¹ Faculty of Medicine, Universitas Airlangga, Surabaya.

² Department of Clinical Pathology, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Hospital, Surabaya.

³ Department of Biochemistry, Faculty of Medicine, Universitas Airlangga, Surabaya.

ABSTRACT

Introduction: Hepatitis B is a viral infection that has the potency to become a chronic infection and causes serious complications such as liver cirrhosis and hepatocellular carcinoma. One of the tools to diagnose hepatitis B or cirrhosis and predicting the prognosis is aspartate aminotransferase to platelet ratio index (APRI). The aim of this study is to evaluate the profile of APRI among cirrhotic patients with positive hepatitis B surface antigen (HBsAg).

Methods: This research was a descriptive observational study. The number of the subject was 35 cirrhotic patients with positive HBsAg in Dr. Soetomo General Hospital Surabaya from January-December 2017.

Results: The majority of cirrhotic patients had >1,5 APRI score (48,57%). The most prevalent APRI score in Child A patients for first classification was 0,5 – 1,5 (5,71%) while for second classification was 0,7 – 1,5 (5,71%). The most prevalent APRI score in Child B patients for first classification was 0,5 – 1,5 (17,14%) while for second classification was 0,7 – 1,5 (11,43%). Most of Child C patients had >1,5 APRI score (22,86%). The majority of malignant degeneration patients also had >1,5 APRI score (14,29%).

Conclusion: The majority of cirrhotic patients had >1,5 APRI score. In cirrhotic patients with Child A or B classification, the increase of APRI score was not as much as those with Child C or malignant degeneration classification.

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* Correspondence: leonita.anniwati@fk.unair.ac.id

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Introduction

Undernutrition and stunting are one of many kind health problems that found in developing countries, including Indonesia. This condition usually was associated with helminth and other chronic infections. If we see it holistically, undernutrition and stunting can also cause by bacterial infections and intestinal protozoa infections.

Intestinal protozoa infections is a tropical infectious disease that mainly can be found in developing countries. A study in West Sumba shows 95.5% of all samples were infected by Intestinal Parasitic Infections¹. Protozoa infections can occur in the intestine or other organs according to their life cycle. The protozoa that commonly found as intestinal protozoa infections include *Blastocystishominis*, *Entamoebahistolytica*, *Giardia lamblia*, *Balantidiumcoli*, and *Cryptosporidium sp.* Intestinal protozoa infections can be found as single-infection or mix-infection². Infections caused by intestinal protozoa from different species will cause different symptoms but also have common symptoms such as weight loss³.

Intestinal protozoa infections mainly found in elementary school age children. This is because of their knowledge about personal hygiene and healthy life behaviors are still improving⁴. Infections caused by intestinal protozoa will lead to physiological changes which over a long time will reduce the host's nutritional status⁵.

Intestinal protozoa infections usually occur in areas with poor sanitation status, low economic status, inadequate water sources and health facilities. These characteristics represented by the general condition of Mandangin Island, Sampang District, Sampang Regency.

Based on the background, This study was aiming to determine "Intestinal Protozoa Infections in Relation to Nutritional Status of the Mandangin Island Elementary School 6 in Sampang Regency " to find out the correlation between the two variables.

Methods

This research was a descriptive observational study. The independent variables were cirrhosis and HBsAg, while the dependent variable was AST level and platelet count. The population was outpatients' medical record data at Dr. Soetomo General Hospital Surabaya in the period of January 2017 - December 2017 with cirrhosis diagnosis and positive HBsAg and had received approval of ethical clearance from ethics commission of Faculty of Medicine Universitas Airlangga and Dr. Soetomo General Hospital Surabaya. Samples were obtained using consecutive sampling technique according to inclusion criteria which were patient who went to Dr. Soetomo General Hospital Surabaya in January 2017 - December 2017 with a diagnosis of cirrhosis and had positive HBsAg. The exclusion criteria include patients with other additional disease that affect AST level such as hemochromatosis, heart failure, and alcoholic fatty liver; patients with other additional disease that affect platelet count such as ITP, leukemia, and aplastic anemia; alcoholic patients, drug user patients, and other patients with a form of habit that affect AST and/or platelet during medical care. The data

obtained will be analyzed and presented in the form of tables.

Results

Table 1. The characteristics of the subjects.

n = 35	
Age	
<20	0 (0%)
20-39	2 (5,71%)
40-59	24 (68,57%)
>59	9 (25,71%)
Sex	
Male	33 (94,28%)
Female	2 (5,71%)
Child-Pugh classification	
Child A	3 (8,57%)
Child B	9 (25,71%)
Child C	12 (34,29%)
Malignant degeneration	8 (22,86%)
No data	3 (8,57%)

The results of this study revealed that from 35 patients, the majority of age is 40-59 years old (68,57%), nearly all patients are male (94,28%), and the most common Child-Pugh class is Child C (34,29%).

Table 2. The AST level of subjects.

AST (U/L) Child-Pugh	5 – 35 (normal)	36 – 175 (mildly increase)	176 – 350 (moderately increase)	>350 (severely increase)	No Data
Child A	1 (2,86%)	2 (5,71%)	0 (0%)	0 (0%)	0 (0%)
Child B	4 (11,43%)	4 (11,43%)	1 (2,86%)	0 (0%)	0 (0%)
Child C	1 (2,86%)	10 (28,57)	1 (2,86%)	0 (0%)	0 (0%)
Malignant Degeneration	0 (0%)	6 (17,14%)	2 (5,71%)	0 (0%)	0 (0%)
No Data	0 (0%)	2 (5,71%)	0 (0%)	0 (0%)	1 (2,86%)

Total	6 (17,14%)	24 (68,57)	4 (11,43)	0 (0%)	1 (2,86%)
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The results of this study revealed that from 35 patients, most patients (68,57%) had mildly increase AST level (36-175 U/L).

Table 3. The platelet count of subjects.

Child-Pugh	Platelet (x10 ³ /μL)	<50 (severe thrombocytopenia)	50 – 69 (moderate thrombocytopenia)	70 – 149 (mild thrombocytopenia)	150 – 400 (normal)	>400 (thrombocytosis)
Child A	0 (0%)	0 (0%)	2 (5,71%)	1 (2,86%)	0 (0%)	
Child B	1 (2,86%)	1 (2,86%)	4 (11,43)	3 (8,57%)	0 (0%)	
Child C	1 (2,86%)	2 (5,71%)	5 (14,29%)	4 (11,43%)	0 (0%)	
Malignant Degeneration	0 (0%)	0 (0%)	3 (8,57%)	3 (8,57%)	2 (5,71%)	
No Data	0 (0%)	1 (2,86%)	1 (2,86%)	1 (2,86%)	0 (0%)	
Total	2 (5,71%)	4 (11,43%)	15 (42,86%)	12 (34,29%)	2 (5,71%)	

The results of this study revealed that from 35 patients, most patients (42,86%) had mild thrombocytopenia (70.000 – 149.000/μL).

Table 4. The APRI value of subjects for the first classification.

Child-Pugh	APRI	<0,5	0,5 – 1,5	>1,5	No Data
Child A	1 (2,86%)	2 (5,71%)	0 (0%)	0 (0%)	
Child B	0 (0%)	6 (17,14%)	3 (8,57%)	0 (0%)	
Child C	1 (2,86%)	3 (8,57%)	8 (22,86%)	0 (0%)	
Malignant Degeneration	0 (0%)	3 (8,57%)	5 (14,29%)	0 (8,57%)	
No Data	0 (0%)	1 (2,86%)	1 (2,86%)	1 (2,86%)	
Total	2 (5,71%)	15 (42,86%)	17 (48,57%)	1 (2,86%)	

The results of this study revealed that from 35 patients, most patients (48,57%) had >1,5 APRI value for first classification. Most Child A patients (5,71%) had 0,5 – 1,5 APRI value, most Child B patients (17,14%) had 0,5 – 1,5 APRI value, most Child C patients (22,86%) had >1,5 APRI value, and most malignant degenerative patients (14,29%) had >1,5 APRI value.

Table 5. The APRI value of subjects for the second classification.

Child-Pugh	APRI	<0,7	0,7 – 1,5	>1,5	No Data
Child A	1 (2,86%)	2 (5,71%)	0 (0%)	0 (0%)	
Child B	2 (5,71%)	4 (11,43%)	3 (8,57%)	0 (0%)	
Child C	1 (2,86%)	3 (8,57%)	8 (22,86%)	0 (0%)	
Malignant Degeneration	0 (0%)	3 (8,57%)	5 (14,29%)	0 (8,57%)	
No Data	0 (0%)	1 (2,86%)	1 (2,86%)	1 (2,86%)	
Total	4 (11,43%)	13 (37,14%)	17 (48,57%)	1 (2,86%)	

The results of this study revealed that from 35 patients, most patients (48,57%) had >1,5 APRI value for first classification. Most Child A patients (5,71%) had 0,7 – 1,5 APRI value, most Child B patients (11,43%) had 0,7 – 1,5 APRI value, most Child C patients (22,86%) had >1,5 APRI value, and most malignant degenerative patients (14,29%) had >1,5 APRI value.

Discussion

The trend that occurs on cirrhotic patients classification are Child C-class cirrhosis (34,29%). This may happen because cirrhotic patients usually start to seek help from medical care only after their disease become unbearable. A study in RSUP Sanglah Denpasar found similar result where Child A patients are the least in number compared to Child B and C⁹. This phenomenon doesn't always occur in every medical institution, as another study stated that the majority of their patients are Child A-class cirrhosis¹⁰. From these facts, we have to do routine screening in the future for chronic hepatitis B patients, therefore if cirrhosis is detected, we can find it in Child A class.

Majority of patients have 70.000 – 149.000 /μL platelet count (42,86%) or mild thrombocytopenia. Thrombocytopenia on the cirrhotic patient can be caused by portal hypertension that leads to splenomegaly and platelet retention on the spleen⁵. Another contributing factor is TPO decrease as hepatocytes destruction increase⁶. The trend of AST level is 36 – 175 U/L (68,57%) or mild increase. The result is similar with another study, stating that the majority of cirrhotic patients involving hepatitis virus only have a mild increase of AST level¹¹. AST level rise because the stored AST in cytoplasm and mitochondria leak out and circulate in the blood as the hepatocytes got damaged or destructed. Other factor includes decreasing AST clearance by the liver⁸.

APRI has a different classification for the different purpose. This study uses 2 classifications of APRI. The first classification is used to determine whether cirrhosis is present or not, while the second classification is used to see the majority of APRI value from Child A, B, C, and malignant degeneration patients. The majority of patients have >1,5 APRI value (48,57%). This result fits a theory stating that >1,5 APRI value shows the presence of cirrhosis in the liver¹². This result can also be caused by the fact that Child C patients are the most prevalent classification (34,29%), therefore the majority of APRI value increase as much as >1,5. Another study stated that Child-Pugh score and APRI value have a positive correlation, where patients with high Child-Pugh score will likely have high APRI value as well⁴.

Majority of Child A and Child B patients have 0,5-1,5 APRI value for first classification (5,71% and 17,14%). This value can't determine whether or not cirrhosis is present¹². For the second classification, the majority of Child A and Child B patients have 0,7-1,5 APRI value (5,71% and 11,43%), similar with a study stating that the majority of Child A and B patients have 0,7-1,5 APRI value¹³.

Child C and malignant degeneration patients have >1,5 APRI value most of the time, for first classification and second classification as well (22,86% and 14,29%). This value shows the presence of cirrhosis¹². It also fits another result from a study stating that the majority of Child C patients have >1,5 APRI value¹³.

There are four patients (11,43%) with APRI value <0,7. One of them is Child A patient, another two is Child B, while the last patient is Child C. For Child A and B, this may be caused by the progressivity of their disease that has not reached a certain level to make their APRI value increase. While for Child C patient, this can be caused by something different. The damage of the liver may be advanced enough to make the AST production decrease. Therefore, when hepatocytes got damaged, the leaked AST will not be as much as it used to, and the APRI value will not increase as high.

Conclusion

The majority of cirrhotic patients had >1,5 APRI score. In cirrhotic patients with Child A or B classification, the increase of APRI score was not as much as those with Child C or malignant degeneration classification. This can be caused by the fact that in the majority of patients, the increase of APRI scores become bigger by the increase of severity or stage of the disease.

CONFLICT OF INTEREST

The author stated there is no conflict of interest.

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