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Hepatitis B Virus Prevalence in Three University Students in Timor-Leste

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Abstract---*Hepatitis B is a deadly and contagious disease that knows no age, both children, adults and the elderly. Timor-Leste is one of the newly independent countries within 20 years, however, in terms of infectious diseases, one of which is hepatitis B, in this youngest country it has been categorized with a high endemicity of 8.5%- 12.4% (Silva, 2009). Thus, it is necessary to anticipate so that the prevalence of hepatitis B does not continue to rise, and immediately take early prevention for the younger generation in the country of Timor-Leste, therefore one way is to carry out early detection of hepatitis B in students with the aim of knowing the presence or absence of infection. hepatitis B virus in a person's body. Thus, it can provide recommendations to the government to prevent it by vaccinating all future generations. The main reason for early detection of medical and health science students at the three universities is to prevent horizontal transmission of the hepatitis B virus in Timor-Leste. This study aims to determine the prevalence of hepatitis B virus infection and risk factors for hepatitis B virus infection in students of the Faculty of Medicine and Health Sciences from three universities in Timor-Leste. The research method used is descriptive analytic, with a cross sectional research design. Blood was taken from a vena using a 5 ml syringe and put in an EDTA tube, the blood was centrifuged for 10 minutes after which the serum was used for HBsAg examination, the serum was examined using the Rapid Cassette test and confirmed using the Enzyme-Linked Immunosorbent Assay (ELISA) method in laboratory. The study was conducted from August 2019 to October 2019 and obtained a sample of 168 students who were screened for hepatitis B, consisting of 55 male students and 113 female students. The results of the study concluded that: 1) the prevalence of hepatitis B virus (3.57%) in the student population of three universities in Timor-Leste is in the low endemicity group, 2) blood transfusion is a risk factor for HBV in students from three universities in Timor-Leste, 3) dental care is a risk factor for HBV infection in students from three universities in Timor-Leste. The risk factor for contracting hepatitis B virus is horizontal transmission.*
Keywords---*enzyme-linked immunosorbent assay (ELISA), hepatitis B, Timor Leste, university student, virus prevalence*

Introduction

Hepatitis B is a deadly and contagious disease that knows no age, both children, adults and the elderly. Timor-Leste is one of the newly independent countries within 20 years, however, in terms of infectious diseases, one of which is hepatitis B, in this youngest country it has been categorized with a high endemicity of 8.5%- 12.4% (Silva, 2009). Thus, it is necessary to anticipate so that the prevalence of hepatitis B does not continue to rise, and immediately take early prevention for the younger generation in the country of Timor-Leste, therefore one way is to carry out early detection of hepatitis B in students with the aim of knowing the presence or absence of infection. hepatitis B virus in a person's body. Thus, it can provide recommendations to the government to prevent it by vaccinating all future generations. The main reason for early detection of medical and health science students at the three universities is to prevent horizontal transmission of the hepatitis B virus in Timor-Leste. This study aims to determine the prevalence of hepatitis B virus infection and risk factors for hepatitis B virus infection in students of the Faculty of Medicine and Health Sciences from three universities in Timor-Leste (Thyagaraju, 2016; Manzaba & Rodríguez, 2021).

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Method

The study was conducted from August 2019 to October 2019 and obtained a sample of 168 students who were screened for hepatitis B, consisting of 55 male students and 113 female students. Blood was taken from a vena using a 5 ml syringe and put in an EDTA tube, the blood was centrifuged for 10 minutes after which the serum was used for HBsAg examination, the serum was examined using the Rapid Cassette test and confirmed using the Enzyme-Linked Immunosorbent Assay (ELISA) method in laboratory. The research method used is descriptive analytic, with a cross sectional research design (Hamblin et al., 1986; Qian et al., 2009).

Results

Sample characteristics

The sample table of 168 Health Program students from three different universities conducting early detection with HBsAg examination based on ages 21 to 36 years is: 61 (36.3%). The results of the survey analysis are as follows

Table 1
Característica da amostra de pesquisa (n = 168)

Variable	Category	Total	Percent % (n=168)
Gender	Male	55	32,7
	Female	113	67,3
Age	18 – 20	58	34,5
	21 – 30	61	36,3
	31 – 40	14	8,3
	41 – 50	32	19,0
	51 – 60	3	1,8
University	MIST	64	38,1
	ISC.polo	50	29,8
	UNTL	54	32,1
Status	Student	168	100

Characteristics of the sample by age and sex of students

More students who did HBsAg examination between the ages of 21 years and 30 years were 61 (36.3%), students aged 18 years and 20 years were 58 (34.5%), and based on gender were male students 55 (32 ,7%) and 113 female students (67.3%). The students who performed the most HBsAg examinations were students from MIST 64 (38.1%), students from UNTL 54 (32.1%) and Institute Superior Cristal 50 (29.8%) (Ahmad et al., 2010; Anderson et al., 2018).

Hepatitis B prevalence by sex, university and Total prevalence

Table 2
Analysis of Hepatitis B Prevalence by Gender, University

Characteristics	Hepatitis B		Prevalence%
	Positive	Negative	
Male	2	53	1,19
Female	4	109	2,38
Maliana Instituto Siencia tecnologia	3	47	1,79
Institute Superior Cristal	2	33	1,19
Universitas Nacional TL	1	29	0,60
Prevalence 3 Univ.	6	162	3,57

Based on Table 2, the prevalence of hepatitis B among students of the Faculty of Medicine and Health Sciences of three Universities in Timor Leste is in male students 2 (1.19%), Female 4 (2.38%), while the prevalence in Universities from each -each University is MIST 3 (1.79%), ISC 2 (1.19%) and UNTL 1 (0.60. While the total prevalence of hepatitis B in the three Universities is 6 (3.57%) (Bonita et al., 2006; Mohd Hanafiah et al., 2013).

Prevalence of hepatitis B virus based on risk factors

Table 3
Hepatitis B prevalence by risk factor

Risk Factors		Hepatitis B		Prevalence
		Positive	Negative	
Syringe alternately	Yes	5	115	2,98%
	No	1	47	
Blood Transfusion	Yes	1	10	0,60%
	No	5	152	
Dental care	Yes	4	44	2,38%
	No	2	118	
Tattoo	Yes	0	11	0%
	No	6	151	
Acupuncture	Yes	2	5	1,19%
	No	4	157	
Razor	Yes	5	58	2,98%
	No	1	104	
Alternate toothbrush	Yes	6	62	3,57%
	No	0	100	

Based on Table 3, the prevalence of hepatitis B at three universities in Timor-Leste for the risk factor for sharing needles was 115 (2.98%,) risk factor for dental care 10 (2.38%), and razor or razor 58 (2, 98%), alternate toothbrushes 62(3.57%) (Trépo et al., 2014; Mast et al., 1999).

The relationship between gender and the incidence of hepatitis B

Table 4
Relationship between sex and the incidence of hepatitis B

Gender	+Ag				Total		OR (95% CI)	p value
	Yes		No					
	n	%	N	%	N	%		
Male	2	1,19	53	31,55	55	32,74	1.028 (0,183 – 5,793)	0,975
Female	4	2,38	109	64,88	113	67,26		
Total	6	3,57	162	96,43	168	100		

Note: OR = Odds Ratio CI = Confidence Interval

Table 4 shows the results of p> 0.05 indicating that there is no relationship between gender and the incidence of hepatitis B (Li et al., 2019; Perz et al., 2006).

Relationship between Age and the incidence of Hepatitis B Virus

Table 5
Relationship between Age and incidence + Ag

Age	Ag + Yes		Ag + No		Total		OR (95% CI)	p value
	n	%	N	%	n	%		
18 – 20	1	0,60	57	33,93	58	34,52		
21 – 30	1	0,60	60	35,71	61	36,31		
31 – 40	2	1,19	12	7,14	14	8,33	0,628	0,166
41 – 50	2	1,19	30	17,86	32	19,05	(0,325 – 1,213)	
50 – 60	0	0,00	3	1,79	3	1,79		
Total	6	3,57	162	96,43	168	100		

Note: OR = Odds Ratio CI = Confidence Interval

Table 5 shows the results of p>0.05 indicating that there is no relationship between age and the incidence of hepatitis B

The relationship between university and the incidence of hepatitis B

Table 6
The Relationship between Higher Education and the Incidence of Hepatitis B

University	+Ag Ye		+Ag No		Total		OR (95% CI)	p value
	n	%	N	%	n	%		
UNTL	1	0,60	53	31,55	54	32,14		
ISC Polo	2	1,19	48	28,57	50	29,76	0,653	0,421
MIST	3	1,79	61	36,31	64	38,10	(0,231 – 1,844)	
Total:	6	3,57	162	96,43	168	100		

Note: OR = Odds Ratio CI = Confidence Interval

Table 6 shows the results of p>0.05 indicating that there is no relationship between higher education and the incidence of hepatitis B (Kember, 1997; Kokkinos et al., 2014).

Relationship between risk factors and incidence of hepatitis

Table 7
The relationship of risk factors with the incidence of hepatitis B

Risk Factors		Hepatitis B Positive	Hepatitis B Negative	OR (95% CI)	p value
Syringe alternately	Yes	5	115	1,704 (0,074 – 39,223)	0,739
	No	1	47		
Blood Transfusion	Yes	1	10	61,361 (1,812 – 2078,069)	0,022
	No	5	152		
Dental Care	Yes	4	44	16,030 (1,327 – 193,571)	0,029
	No	2	118		
Permanent tattoo	Yes	0	11	-	0,998
	No	6	151		

Acupuncture	Yes	2	5	23,673 (0,936 – 598,553)	0,055
	No	4	157		
Razor	Yes	5	58	2,076 (0,144 – 29,992)	0,592
	No	1	104		
Brush teeth alternately	Yes	6	62	3861582602,357)	0,994
	No	0	100	-	

Note: OR = Odds Ratio CI = Confidence Interval

Based on Table 7, it is known that blood transfusion and dental care have a significant relationship with the incidence of hepatitis B, with Pv <0.05. (p<0.05) (Jefferies et al., 2018; Aini & Susiloningsih, 2013; Solomon et al., 2014).

Discussion

Hepatitis B virus infection is a major health problem worldwide. Chronic hepatitis B results in a variety of complications: asymptomatic, liver cirrhosis, liver failure, and hepatocellular carcinoma. Thus, the hepatitis B virus is a threat to the health of the world community, as it causes considerable morbidity, mortality and economic losses. Currently, about than 360 million people suffer from HBV (carriers) in the world 78% of people with this disease live in Southeast Asia, including Timor-Leste (WHO, 2010). Several risk factors have been identified as having a role in the spread of hepatitis B. Based on different reporting sources, the prevalence of HBsAg in the general population in Timor-Leste ranges from 6.9% to 12.4% (WHO, 2010; Silva, 2009). Hepatitis B virus infection causes acute, chronic, and fulminant hepatitis infections, in addition to cirrhosis and liver cancer (Schweitzer et al., 2015; Stockdale et al., 2020).

This survey was performed using a cross-sectional design to determine the prevalence of hepatitis B surface antigen (HBsAg). Based on the results of the HBsAg survey and examination in Medical and Health Sciences students at three universities in Timor-Leste, from August 2019 to November 2019, 168 samples were obtained, of which 168 students are found 6 (3.57%) HBsAg positive. From previous studies, the prevalence of HBsAg is currently around 12.4% (Silva, 2009), so Timor-Leste is a country with high endemicity. Prevalence based on sex, there is a difference between female students 4 (2.38%) and male students 2 (1.19%) in healthy students. This could be because HBsAg positive can be found in healthy carriers (healthy carriers), chronic hepatitis B, cirrhosis of the liver, or primary liver cancer. To find out more, it is necessary to do deeper research using the molecular examination method. This is different from the research carried out by Obekpa et all; 2014, the students of the clinical staff of the University of Jos in Nigeria were 7.22%. While the survey carried out by Krishna et al, in 2017, students at the Faculty of Medicine of Bali were inferior by 2.8% compared to the survey carried out on students of medical and health sciences in Timor-Leste. This could have happened due to the difference between the sample sizes used by each researcher.

However, in a study carried out by Ahmad in 2010 in Pakistan, there was a positive prevalence of HBsAg in 0.6%, a lower value than the prevalence of this study (3.57%), which shows that the risk of becoming infected with hepatitis B in students of medical and health students in Timor-Leste is higher. The results of this study indicate that the largest number of students performing early detection was 113 female students (63.7%). This happens because the students prefer to protect themselves from hepatitis B and realize that it is women who transmit the hepatitis B virus from mother to baby vertically. It is the same as the research carried out by (Spearman et al., 2017). Based on the overall prevalence of Timor-Leste included in the high endemicity group, both in terms of male and female gender prevalence. The level of endemicity of hepatitis B virus infection can describe the pattern of transmission, based on reports that in areas with high levels of endemicity, the dominant pattern of transmission of hepatitis B virus infection is vertical transmission and horizontal transmission in early childhood. Based on the results of this study, medical and health students at three universities in Timor-Leste were in the low endemicity group (3.57%), and since the prevalence of female students is slightly higher (2.38), the possibility of patterns of vertical transmission and horizontal transmission in children In early childhood, what needs to be done is prevention with immunization against hepatitis B, especially in female students for prevention, so that the pattern of transmission of hepatitis B virus infection from a generation to the next can be avoided, especially vertical and horizontal transmission patterns.

As Timor-Leste is included in the high endemicity of hepatitis B, HBsAg negative students still need hepatitis B vaccination to prevent infection. If the results of early detection of students show positive results for HBsAg, they

should be immediately notified and advised to seek treatment at health facilities in Timor-Leste. Based on the results of a univariate analysis of risk factors associated with the incidence of hepatitis B, 2 statistically significant variables ($p < 0.05$) were obtained, namely, blood transfusion history and dental care. The final results showed that for risk factors for blood transfusion with an odds ratio of 61.361, while for risk factors for dental care and odds ratio: 16.030. This shows that a history of blood transfusion and dental care has a high risk of hepatitis B virus infection. The results of interviews with medical and health science students from the three universities said that there was never a hepatitis B surface antigen test and there was no health promotion about the danger of transmission of the hepatitis B virus to the students of the three universities. Preventive actions must be taken in students, given that the risk of transmission of hepatitis B that occurs is quite high. Hepatitis B control is more possible through prevention, immunizing students than through inadequate treatment, given that medicines were not provided to the fullest by the country of Timor-Leste.

Conclusion

Based on the results of research, analysis and discussion, the following conclusions can be drawn:

1. The prevalence of hepatitis B virus (3.57%) in the student population of three universities in Timor-Leste is in the low endemicity group
2. Blood transfusion is a risk factor for HBV in students from three universities in Timor-Leste.
3. Dental care is a risk factor for HBV infection in students from three universities in Timor-Leste
4. The risk factor for contracting hepatitis B virus is horizontal transmission.

Novelty/ Novelty
This research is conducted for the first time on active students studying in Timor-Leste.

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