

Original Article

Prevalence of HBsAg positive among non-immunized junior high school students in Bandung

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Abstract

Background Sero-epidemiologic survey of hepatitis B is used to determine the prevalence of hepatitis B infection in community, particularly among population which has not been covered by hepatitis B immunization program.

Objective To determine the prevalence of HBsAg positive among junior high school's students in Bandung.

Methods A cross-sectional study was conducted on junior high school (SMP) students. Subjects were selected randomly using stratified cluster sampling of 4 junior high schools in Bandung. The inclusion criteria were students of first and second grade, lived in Bandung area, without history of hepatitis B immunization. Subjects were interviewed and were screened for HBsAg using Reverse Passive Hemagglutination technique.

Results There were 341 subjects consisted of 201 girls and 140 boys. None of the subjects had any sexual intercourse or intravenous drugs, while 261 subjects (76.5%) had shared personal care. History of blood transfusion was found in 13 subjects (3.8%), tattooing in 2 (3.8%), body piercing in 28 (8.2%), and contact with chronic liver disease patients in 16 (4.7%). Based on HBsAg serologic test, 3 subjects (2 boys and 1 girl) were found to be positive, thus HBsAg positive prevalence was 0.9% (95%CI -0.001;0.019). Two of them had shared personal care with their relatives or friends. None of them had tattoo, body pierce, blood transfusion, or contact with chronic liver disease patients. Their physical condition were within normal limit. One of them refused to do further laboratory tests because no permission from his parents. Liver function of those students were normal, anti-HBc IgM were negative, and total anti-HBc were positive in two of them.

Conclusion The prevalence of HBsAg positive in junior high school students in Bandung is low and there is no obvious risk factor for the transmission of the disease. [Paediatr Indones 2007;47:252-255].

Keywords: Prevalence, hepatitis B, junior high school

Hepatitis B virus (HBV) infections represent a globally encountered public health burden, with a major impact in South-East Asia and sub-Saharan Africa. They are responsible for the large spectrum of ensuing liver diseases that display a high frequency of either became chronic or lead to the respective patients' demise. The number of globally HBV carriers is estimated to be in a range of 400 to 500 million, and more than one million deaths are attributable to HBV infections annually.¹⁻³ Indonesia is one of the endemic area in the world for HBV infection and the variation between area was high. According to a review article, averages seropositivity of Hepatitis B surface antigen (HBsAg) in Indonesian population is 9.38%. The highest prevalence is in Kupang (25.6%), followed by Mataram (20.8%), Makasar (15%), Bandung (4.2%), and Banjarmasin (2.5%) as the lowest.⁴

Adolescents represent a substantial proportion in Indonesian population. According to *Biro Pusat Statistik* (BPS), 10 to 19 year-old-group in 1999 were

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around 22% of population in Indonesia. Junior high school students are children in early adolescent period. In this period they undergo transitions in behavior and social interaction. In order to expand their interaction and gain acceptance from their peers, adolescents dare enough to conduct high risk behaviours, such as illicit drugs use, tattooing, body-piercing, and sexual intercourse.⁵ Students of junior high school with the age of 12 to 15 years old at this time, born around 1990 to 1992, when hepatitis B immunization had not been yet included in the Expanded Programme on Immunization (EPI) in Indonesia. Only a small number of these adolescents had hepatitis B immunization when they were babies. The aim of this study was to determine the prevalence of HBsAg among junior high school students.

Methods

A cross-sectional study was conducted on junior high school (SMP) students. Subjects were selected randomly using stratified cluster sampling of 4 junior high schools in Bandung, i.e., SMPN 19, SMPN 51, SMP Muslimin 3, and SMP PGRI Ujungberung.

Study subjects were selected using purposive sampling from students of the first and the second grade. Sample size was calculated using single proportion estimation. The inclusion criteria were students of first and second grade, lived in Bandung area, without history of hepatitis B immunization and with informed consent from their parents. Their participation in the study was voluntary. Subjects were excluded if they were absent at the time of blood specimen taking for laboratory tests.

The study was conducted from March to May 2005. HBsAg were qualitatively screened using Reverse Passive Hemagglutination (RPHA® Entebe RPHA cell produced by Hepatica Laboratories LTD, Mataram, Indonesia) in Biofarma Laboratory. The sensitivity and specificity of this test was 99% and 97% compared to Enzymme Immuno Assay (EIA) test.

All of the first and the second grade junior high school students in target schools were given information about hepatitis B, study enrollment sheet (informed consent), and questionnaire for their parents. Those who fulfilled the inclusion criteria and returned their questionnaires and informed consent

were enrolled in the study. At the time of blood specimen taking, the investigator did a direct interview with the subjects about some high risk behaviors for hepatitis B infection.

The study was approved by the Ethics Committee at Faculty of Medicine University of Padjadjaran/Hasan Sadikin General Hospital, Bandung.

Results

Of 1,841 students of the four junior high schools, 719 (39%) returned their sheets; 419 of which (23%) gave written permissions from their parents. Of those, 78 were found to have been immunized previously with hepatitis B, leaving 341 (18.5% of the total studnets) The characteristics of the subjects are presented in **Table 1**.

None of the students ever had sexual intercourse or illicit drugs use before. As much as 74.2% admitted to have ever shared personal care and 8.2% had body piercing. Blood transfusion, tattoo, and history of contact with patients of chronic liver disease, were noted in 3.8%, 0.6%, and 4.7% of subjects, respectively.

Three (0.9%) of the 341 subjects (95%CI-0.001;0.019) were found to be HBsAg positive.

Discussion

Some of the junior high school students had already performed high risk activities for transmission of hepatitis B (**Table 2**). Although there was a tendency to have first sex at younger age compared to last decades,⁶ the students in this study reported that they never had any sexual intercourse. They also admitted

Table 1. Subject's characteristics

Characteristics	Subjects		Number of HBs Ag positive
	Number	%	
Sex			
Girls	201	58.9	1
Boys	140	41.1	2
Age			
≤ 13 years old	177	51.9	2
>13 years old	164	48.1	1
Junior high school origin			
Government	150	44	1
Private	191	56	2

Table 2. Risk factors for transmission of HBV infection

Risk Factors	Subjects		Number of HBs Ag Positive
	Number	%	
Sharing personal care	253	74.2	2
Transfusion	13	3.8	0
Tattooing	2	0.6	0
Body piercing	28	8.2	0
Contact with chronic liver disease patient	16	4.7	0

that they never had used illicit drugs, especially the intravenous ones. This was a good news since intravenous drugs use and sexual activity were significant risk factors for transmission of hepatitis B infection in adolescents.^{6,7}

From 314 junior high school students enrolled in this study, there were 253 (74.2%) students who had ever shared personal care such as comb, tooth brush, or shaver (151 girls and 102 boys). As many as 2 (0.6%) students had tattoos (1 girl and 1 boy). Twenty eight (8.2%) students, 23 girls and 5 boys had body piercing.

Although nowadays blood screening program for blood transfusion was a Standard procedure, transfusion of blood or blood products is one of the risk factors for hepatitis B transmission. From 341 students, there were 13 (3.8%) students who had blood transfusion in the past. There were 16 (4.7%) students who had contact with chronic liver disease patient

It is clear that students in junior high school had already started high risk activities i.e sharing personal care, tattooing, and body piercing, that make them get in high risk for hepatitis B transmission since all of them had no protection (hepatitis B vaccination).

None of the 3 students with positive HBsAg had tattoo or body piercing, nor had contact with chronic liver disease patient. Two of them had shared personal care with their siblings, friends, or parents.

Physical examination in those 3 students revealed normal results, with no signs of liver disease or cirrhosis. Only two who were willing to do further laboratory tests, including liver function tests, anti-HBc IgM, and total anti-HBc. One of them refused to do it because his parent felt his son is healthy, with no signs or symptoms of any diseases. Liver function tests of those students were normal, anti HBc IgM results were negative and total anti HBc results were positive. The negative results of the anti HBc IgM

showed that hepatitis B infection had lasted for a long time, more than 32 weeks.¹ The 3 students were likely to be infected with HBV for more than 6 months and tare at risk to become chronic.

The prevalence of positive HBsAg in junior high school students in Bandung was 0.9% (95%CI: 0,001; 0,019). This was lower than that of the study in Korea, which reported prevalence as much as 2.1% in boys and 2.7% in girls under 20 years.⁸ However, the prevalence in this study was higher than that of the result in Spain, which was 0.3% in children of 10-14 years.⁹ The result of presence study was similar to that of the study in Thailand, which was 0.7% in children of <18 years.¹⁰ When compared with the national seropositivity of HBsAg in Indonesian population (2.5% to 25.6%) our data give very low prevalence. Further studies are needed to elaborate the low prevalence of HBsAg in junior high school students in Bandung.

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