

# Prevalence of Hepatitis B and C Infection Among Street Children Community in Malang City

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## ABSTRACT

**Background:** World Health Organization (WHO) announced that during 2017, 325 million people worldwide were infected with the hepatitis B virus (HBV) or hepatitis C virus (HCV). Street children community is a part of society that is susceptible to HBV and HCV transmission, yet no data available about the prevalence. The purpose of this study was to determine the prevalence of hepatitis B and hepatitis C infections in street children community of Malang during 2017.

**Method:** This cross-sectional study was conducted in September 2017 with subjects of street children who were members of the East Java Humanitarian Network (EJHN) group. They were interviewed, got vital signs examined, and performed HBsAg and anti HCV tests using the ECLIA method.

**Results:** There were 90 subjects, with more male than female (60%). The most frequent age range was between 21 to 30 years (35.6%). Most of them do not have permanent jobs (37.8%). The level of education varied, with 30% were at the level of primary education and 56.7% were married. There were 4.4% hepatitis B positive and 1.1% of hepatitis C positive among the subjects. Subjects with positive results had history of free sex, tattoos, and intravenous drugs abuse as the risk factors of HBV and HCV transmission.

**Conclusion:** The prevalence of Hepatitis B and Hepatitis C in the population of street children in Malang city, East Java, were 1.1% and 4.4%, respectively. The most common risk factors were free sex and tattoos.

**Keywords:** street children, hepatitis B, hepatitis C, HBsAg, anti HCV

## ABSTRAK

**Latar belakang:** Data World Health Organisation (WHO) tahun 2017 menunjukkan 325 juta penduduk dunia terinfeksi virus hepatitis B (VHB) atau virus hepatitis C (VHC). Anak jalanan merupakan kelompok masyarakat yang memiliki risiko tinggi transmisi VHB dan VHC. Tujuan penelitian ini adalah untuk mengetahui prevalensi infeksi hepatitis B dan hepatitis C pada anak jalanan di kota Malang tahun 2017.

**Metode:** Studi cross-sectional ini dilakukan pada September 2017 dengan responden anak jalanan yang tergabung dalam naungan kelompok Jaringan Kemanusiaan Jawa Timur (JKJT). Pada responden dilakukan anamnesis, pemeriksaan tanda vital dan pengampilan sampel darah. Pemeriksaan HBsAg dan anti HCV dilakukan menggunakan metode ECLIA.

**Hasil:** Terdapat 90 orang responden, pria lebih banyak dari wanita (60%) dengan rentang usia terbanyak adalah kelompok usia 21-30 tahun (35,6 %). Sebagian responden belum memiliki pekerjaan tetap (37,8%). Tingkat pendidikan responden beragam, sebanyak 30% berada pada tingkat pendidikan dasar dan sebanyak 56,7% sudah menikah. Terdapat 4,4% pasien yang positif hepatitis B dan 1,1% pasien yang positif hepatitis C. Responden dengan hasil positif memiliki riwayat hubungan seksual bebas, tato dan merupakan bekas pengguna narkotika suntik sebagai faktor risiko transmisi VHB dan VHC.

**Simpulan:** Prevalensi Hepatitis B dan Hepatitis C pada populasi anak jalanan di kota Malang, Jawa Timur, sebagai kelompok berisiko tinggi terinfeksi hepatitis adalah masing-masing 1,1% dan 4,4%. Faktor risiko yang paling banyak ditemukan adalah hubungan seksual bebas dan tato.

**Kata kunci:** anak jalanan, hepatitis B, hepatitis C, HBsAg, anti HCV

## INTRODUCTION

Hepatitis is a condition where inflammation of the liver tissue occurs with varying clinical symptoms. Acute infections may not be accompanied by specific nor clear clinical manifestations so that many patients do not know that they have hepatitis.<sup>1,2</sup> Currently, hepatitis is a problem throughout the world, including Indonesia. Data from the World Health Organization, (WHO) showed that in 2017 there were 325 million people were infected with hepatitis B virus (HBV) or hepatitis C virus (HCV), worldwide. The 2017 WHO Global Hepatitis Report states that the majority of people with hepatitis do not have access to adequate early detection nor therapy for hepatitis. Thus, millions of people today have risk to get chronic liver failure, cancer, and eventually death.<sup>3-5</sup>

Transmission of HBV and HCV is through contact with blood or body fluids of infected person. It might as well be transmitted through blood transfusions contaminated with HBV or HCV, through cuts/blisters on the skin or mucosa (for example due to the use of needles in injection drug users, piercing ears with needles contaminated with hepatitis virus, making tattoos with non-sterile instruments, the use of shared shavers), and sexual contact with patients with hepatitis B and C. In addition, transmission of HBV can also occur from pregnant women suffering from hepatitis B to their babies (before delivery or as perinatal infection). That is why the detection of hepatitis B and hepatitis C must be carried out intensively, especially in populations with high risk of hepatitis B and C transmission.<sup>6,7</sup>

Street children community is a part of society that has high risk of HBV and HCV transmission. The lifestyle of street children who are closely related to alcohol consumption, free or unsafe sexual relations, the use of illegal drugs, and tattoos are risk factors for the incidence of hepatitis. According to data compiled by the East Java Humanitarian Network (EJHN), which

is a community that houses and fosters street children in Malang, East Java, there are 1200 street children found throughout Malang city. Early examination and early treatment of hepatitis B and hepatitis C in high-risk populations such as the community of street children is important to achieve the global goal of hepatitis elimination by 2030.<sup>8,9</sup> The purpose of this study is to determine the prevalence of hepatitis B and hepatitis C in street children and find out what risk factors are associated with the incidence of hepatitis B and hepatitis C in street children of Malang in 2017.

## METHOD

This was a descriptive cross-sectional study. The population of this study were street children community in Malang which consists of street children, street artists, and homeless person from three EJHN assisted Shelter Houses. The sample selection was done by randomized sampling with inclusion criteria that a subject was willing to take interviews and take blood samples. Criteria for exclusion of this study was if the subject have received hepatitis B vaccination. The number of subjects obtained was 90 persons who subsequently signed an informed consent. Subjects under the age of 17 years old and did not have a parent companion, would be accompanied by a guardian, a volunteer from EJHN.

Interviews and blood sampling were conducted in September 2017 as a series of events commemorating World Hepatitis Day 2017. We did counseling, detection of risk factors, and examination of HBV and HCV in street children. Data collection was carried out with structured interviews and counseling about HIV / HCV and blood samples were taken for HBsAg and total anti-HCV testing. Blood samples were taken from the cubital mediana vein as much as 3 mL. Detection of HBsAg and anti-HCV were performed by reagent strips using immunochromatographic methods.

The variables of this study were the subject's age at blood collection, sex, occupation, education level, and marital status. Risk factors for hepatitis B transmission were history of intravenous drugs abuse, family history of hepatitis, history of blood transfusions, tattoos and free sexual intercourse (multiple partners). Associations between risk factors and the result of HBsAg and anti-HCV test were analyzed using Chi-square or Fisher's exact test. A p-value of less than 0.05 was considered significant. Statistical analyses were performed using the SPSS software version 17.00 for Windows PC.

## RESULTS

Among 90 subjects studied, 60% were male and 40% were female. The age of respondents varies from less than 1 year to more than 40 years in which 70% of subjects were over 17 years old. From a total sample of 90 subjects, it appears that the most frequent age range was 21-30 years old (32 subjects, 35.6%) as shown in Table 1. Types of jobs were varied but most did not have permanent jobs (34 subjects, 37.8%). The level of education of subjects also varied from the elementary degree to the undergraduate degree, with 30% of subjects were at the elementary degree. The marital status showed 56.7% were married. Factors related to the incidence of hepatitis B and C in subjects are explained in Table 1. Of the available variables, the most common risk factors of subjects were free sex (33.3%) and tattoos (31.1%). Of the 90 subjects studied, there were 4.4% hepatitis B positive subjects and 1.1% hepatitis C positive subjects. In 4 subjects who were hepatitis B positive, the risk of hepatitis infection from drug abuse was 25%, the risk from free sex was 25% and the risk due to tattoos was 50%.

**Table 1. Subject characteristics**

Variable	n = 90 n (%)
Sex	
Male	54 (60)
Female	36 (40)
Age	
< 5 years	12 (13.3)
5 - 20 years	17 (18.8)
21-30 years	32 (35.6)
31-40 years	14 (15.6)
>40 years	15 (16.7)
Education level	
Elementary school	27 (30.0)
Junior high school	14 (15.6)
Senior high school	21 (23.3)
Diploma	1 (1.1)
Bachelor/undergraduate	6 (6.7)
Unschooling	21 (23.3)
Marital Status	
Married	51 (56.7)
Un-married	39 (43.3)

Jobs	
Artists	9 (10.0)
Laborer	4 (4.4)
Household assistant	16 (17.8)
Merchant	4 (4.4)
Tailor	1 (1.1)
Driver	1 (1.1)
Self-employee	14 (15.6)
Teacher	1 (1.1)
Student	6 (6.7)
Unemployed	34 (37.8)
Risk Factor	
Drug abuse	
Yes	20 (22.2)
No	56 (62.2)
Family history	
Yes	3 (3.3)
No	79 (87.8)
Needle user	
Yes	6 (6.7)
No	71 (78.9)
Free sex	
Yes	30 (33.3)
No	46 (51.1)
Blood transfusion	
Yes	6 (6.7)
No	71 (78.9)
Tattoos	
Yes	28 (31.1)
No	49 (54.4)

Family history of hepatitis and blood transfusion were not found in the subjects we studied (0%). In 1 subject who was positive for hepatitis C, risk factors found were drugs abuse and use of narcotics injection, free sex and tattoos (Table 2).

**Table 2. Risk factor of hepatitis B and hepatitis C**

Hepatitis B	n (%)	p	OR (CI = 95%)
Negative	86 (95.6)		
Positive	4 (4.4)		
Drugs abuse	1 (25)	0.99	1.175 (0.12-11.95)
Family history of Hepatitis	0 (0)	0.99	0.954 (0.91-0.99)
Needle user	0 (0)	0.99	0.952 (0.91-0.99)
Free Sex	1 (25)	0.99	0.655 (0.06-6.58)
Blood transfusion	0 (0)	0.99	0.952 (0.91-0.99)
Tattoo	2 (50)	0.59	2.308 (0.31-17.28)
Hepatitis C	n (%)	p	OR (CI = 95%)
Negative	89 (98.9)		
Positive	1 (1.1)		
Drugs abuse	1 (100)	0.22	1.053 (0.95-1.16)
Family history of Hepatitis	0 (0)	0.99	0.989 (0.97-1.01)
Needle user	1 (100)	0.07	1.200 (0.84-1.72)
Free Sex	1 (100)	0.33	1.034 (0.97-1.11)
Blood transfusion	0 (0)	0.99	0.988 (0.97-1.01)
Tattoo	1 (100)	0.31	1.037 (0.97-1.11)

## DISCUSSION

It was found that the characteristics of the most subjects (35.6%) were in age range of 21-30 years old, and the most frequent sexes were 54 men. There were only 4 subjects (4.4%) with positive HBsAg results and 1 subject (1.1%) with positive HCV. Whereas according to WHO, Indonesia is a country with medium to high endemicity for hepatitis B and hepatitis C with a prevalence of 7.25% for hepatitis B. Results of Basic Health Research (Riskesdas) in 2013 found that

approximately 18 million people have hepatitis B and 3 million people suffer from hepatitis C in Indonesia. The difference in the results shown by this study could be due to the small number of samples<sup>1,3,4</sup>.

Positive HBsAg were found in four street children aged between 21-30 years old with a prevalence of 4.4%. The prevalence of HBV infection in Indonesia varies depending on geographic areas with moderate to high endemicity between 2.5 - 10%<sup>3,5</sup>. The existence of positive HBsAg results indicates that this person is being exposed to HBV. These results can be found in healthy individual (healthy/subclinical carriers), in patients with chronic hepatitis B, liver cirrhosis and primary liver cancer. To determine the specific disease of the HBsAg positive subjects, further examination is needed (such as liver function test, and hepatitis B serology test (e.g. HBeAg and HBV DNA)<sup>10,11</sup>. Risk factors for exposure to hepatitis B in this population were due to drug abuse, tattoos and free sexual relations with multiple partners. Of the four subjects who had positive HBsAg results, three of them were married and had children. Detection of hepatitis B should also be done on couples and children of patients and followed with hepatitis B vaccination thereafter as indicated.

There was one subject who had a positive anti-HCV result with a prevalence of 1.1%. Based on the Hepatitis C epidemiological study by Petruzzello et al. in 2016<sup>5</sup>, the prevalence of positive Anti HCV in Southeast Asia was 1.6% while in Indonesia the prevalence was 0.8% with the most genotypes being genotype 1. This result is lower than the study of the prevalence of hepatitis C in street children of Iran, where the incidence was 2.4%<sup>9</sup>. Positive anti HCV indicates that the person is currently exposed to HCV infection. Subjects' risk factors were a history of multiple use of syringe during addiction to narcotics, tattoos, and unfaithful sexual relations (multiple partner). In hepatitis C, the most common transmission is through the reuse of syringes and illegal drugs. Although hepatitis C can be transmitted through sexual intercourse, it is not as common as hepatitis B. It is necessary to examine HCV genotypes and measure levels of the virus by examining HCV RNA. Subjects who had positive result for hepatitis C test was married and had children, so the detection of hepatitis C in couples and children should also be done along with counseling about how to prevent transmission of hepatitis C<sup>12-14</sup>.

This study is limited by the small number of samples so a larger scale study is needed to determine the prevalence of Hepatitis B and Hepatitis C in street children communities in Malang and Indonesia.

Further genotype analysis needs to be done on samples with HBsAg and anti-HCV positive so that disease progression can be monitored. Street children are at risk for occurrence of hepatitis B and hepatitis C. Those in the high-risk group need to be vaccinated and counseled about preventive behavior against hepatitis B.

## CONCLUSION

The prevalence of Hepatitis B and Hepatitis C in the population of street children in Malang city, East Java, were 1.1% and 4.4%, respectively. The most common risk factor was unsafe/free sex and tattoos.

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