

The Prevalence of Hepatitis B Virus in Female Commercial Sex Workers

Bradley Jimmy Waleleng, J Kairupan, Nelly Tendean Wenas

Division of Gastroentero-hepatology, Department of Internal Medicine, Faculty of Medicine
University of Sam Ratulangi/Prof. Dr. RD Kandou Hospital, Manado

ABSTRACT

Background: The prevalence of hepatitis B infection in Indonesia was about 2-20%. To date, incidence rate of Hepatitis B Virus (HBV) in female Commercial Sex Workers (CSW) in Manado was not known.

Objective: To investigate the prevalence and risk factors associated with HBV in female CSW.

Methods: This is a descriptive-analytic study with cross-sectional design. Target population was female CSW in Manado.

Results: Of 177 subjects, age range 15-49 years (27.87 ± 7.629), the most frequent age were 20-24 years with 56 subjects (31.6%). Serum HBsAg was positive in 8 (4.5%) subjects. Serum HBsAg was positive in 8 of 143 (5.6%) subjects with intercourse frequency > 5 times weekly, 8 of 142 (5.6%) subjects with sexual partner > 5 per week, 1 of 41 (2.4%) subject worked as CSW < 1 year, 7 of 136 (5.1%) subjects worked as CSW for more than a year, and 1 of 110 (0.9%) subjects who used condom.

Conclusion: Prevalence rate of hepatitis B in female CSW in Manado was 4.5%. There was significant relationship between condom usage and the prevalence of hepatitis B virus infection. There was relationship with some other risk factors but statistically insignificant.

Keywords: hepatitis B virus, prevalence, commercial sex worker, condom usage

INTRODUCTION

Hepatitis B virus (HBV) infection is a public health problem in the world, especially in the developing countries, because some hepatitis B virus infection shall progress into chronic liver disease which will end in hepatic cirrhosis with all its complications and hepatocellular carcinoma.^{1,2}

According to WHO data,³ it is estimated that one-third of world population or about 2 billion people are infected with HBV and about 5% are chronically infected, which means approximately 300-400 million people are HBsAg carrier, and from this number about 220 million (78%) are living in Asia.⁴

Hepatitis B is the main etiology of chronic hepatitis in Asia-Pacific and more than 25% of the patients will eventually died from liver cirrhosis as well as its complications and primary liver cancer.^{4,5,6,7}

The prevalences of HBsAg in the general population in Asia were Japan 0.8%, China 4.6%, Malaysia 3-5%, Indonesia 5%, Philippine 5-16%, Korea 7.3%, and Taiwan more than 10%.⁸

Data regarding prevalence of HBsAg in Indonesia from the studies began at 70's is very variable between 2.5-20%.^{9,10} According to WHO classification these data show that Indonesia is a moderate to high endemic area.³

Transmission of HBV may take route through various modes including percutaneous, mucosal or oral, sexual (horizontal transmission) and through labor or perinatal (vertical transmission).^{2,5,9-11}

Sexual transmission of HBV is the cause of morbidity among population with high-risk sexual activity, whether heterosexual (commercial sex worker) or homosexual, and correlate with sexual behavior such as thr number of partner and duration of sexual activity.^{4,5,11}

In the US and other countries with low and moderate endemic, the most frequent mode of transmission is sexual contact. Recent studies showed that 30-50% hepatitis B were transmitted through sexual

Correspondence: BJ Waleleng
Division of Gastroentero-hepatology
Department of Internal Medicine
Prof. Dr. RD Kandou Hospital
Jl. Raya Tanawangko Manado, Indonesia
E-mail: interna.fkunsrat@yahoo.com

partner.^{11,12,13,14} Figueroa et al, reported that the prevalence of hepatitis B among CSW in Mexico was 0.2% lower than other cities which were around 1.7 - 6.1%.¹⁵ While a study in Russia, revealed that HBsAg positive were more frequent in commercial sex activities (13%) compared with non-commercial (4%).¹³ Takeda et al, from Thailand reported that the prevalence of HBsAg in CSW was 11%, anti-HBc 69%.¹⁴

To date, the incidence rate of HBV in female CSW in Manado was not known, but it is supposed to be high considering the prevalence rate of HBsAg in other studies was around 2-5%.¹⁰ This study was conducted to investigate the prevalence rate and risk factors associated with hepatitis B virus in female commercial sex workers. Risk factors under observations were frequency of sexual activities, number of sexual partner and duration of working as female CSW.

METHODS

This study was a descriptive and analytic study with cross-sectional design, conducted since December 2005 to March 2006. Target population of this study were female CSW in Manado (on the streets, hotels/motels, brothel house). Of 177 subjects fulfilled the inclusion and exclusion criteria. Informed consent was obtained prior to the data collection. The data were obtained from the questionnaire; the information collected were age, marital status, education level, frequency of sexual

activity in a week, number of male sexual partner/week, and the duration of activity as female CSW. Blood sampling for HBsAg was conducted according to enzyme-linked fluorescent (ELFA) with ELISA method. Data analysis was conducted using Z test and correlation coefficient Phi (ϕ).

RESULTS

Of 177 subjects, the range of age were 15-49 year, with mean age 27.87 years and *standard deviation* (SD) 7.629 years, the most frequent age were among age-group 20-24 years with 56 subjects (31.6%), followed by age group 25-29 years with 49 subjects (27.7%), age group 30-34 years with 24 subjects (13.6%), age group 35-39 years with 15 (8.5%) subjects, age group 15-19 with 14 subjects (7.9%), age group 45-49 with 10 subjects (5.6%), and age group 40-44 with 9 subjects (5.1%) (table 1).

About the level of education, from the 177 female CSW in this study, there were 44 (24.9%) with elementary level, 64 (36.2%) with junior high school level, and 69 (39.0%) with senior high school level. On the marital status, there were 116 (65.5%) married, 53 (29.9%) not married and 8 (4.5%) were divorced. According to their place of activity, there were 140 (79.1%) did their activities on the streets and there were 37 (20.9%) in the motels/hotels.

Serum HBsAg were tested in all 177 female CSW in this study. Positive results were found in 8 (4.5%)

Table 1. Distribution of patients according to age, education, marital status, condom usage and frequency of sexual intercourse

Variable	Scale	N	%	Mean \pm SD	HBsAg				p value
					(+)	%	(-)	%	
Age (years)	15-19	14	7.9	27.87 \pm 7.629					
	20-24	56	31.6						
	25-29	49	27.7						
	30-34	24	13.6						
	35-39	15	8.5						
	40-44	9	5.1						
Education	45-49	10	5.6						
	Elementary	44	24.9						
	Junior high school	64	36.2						
Marital status	Senior high school	69	39.0						
	Not married	53	29.9						
	Married	116	65.5						
Condom usage	Divorced	8	4.5						
	With condom	110	62.1						
Frequency of sexual intercourse	Without condom	67	37.9						
	< 5 weekly	34	19.2						
Number of sexual partner	\geq 5 weekly	143	80.8						
	< 5 per week	35	19.8						
Duration as female CSW	\geq 5 per week	142	80.2						
	< 1 year	41	23.2						
Duration as female CSW	\geq 1 year	136	76.8						
	< 1 year	41	23.2						

subjects, while negative results were found in 169 (95.5%) subjects. Condom usage were found in 110 (62.1%) subjects, while 67 (37.9%) did not use it.

Of the 177 female CSW, there were 34 (19.2%) subjects with intercourse frequency of < 5 times weekly. The serum HBsAg were negative for 34 of 34 (100%) and positive for 0 of 34 (0%) of them. There were 143 (80.8%) subjects with intercourse frequency > 5 times weekly. Serum HBsAg were positive in 8 of 143 (5.6%) subjects and negative in 135 of 143 (94.4%) subjects.

Of the 177 female CSW in this study, subjects with sexual partner < 5 per week were 35 (19.8%), and serum HBsAg were positive in 0 of 35 (0%) and negative in 35 of 35 (100%) of them. There were 142 (80.2%) subjects with sexual partner > 5 per week, and serum HBsAg were positive in 8 of 142 (5.6%) and negative in 134 of 142 (94.4%).

Of the 177 female CSW in this study, there were 41 (23.2%) worked as CSW < 1 year, and serum HBsAg were found positive in 1 of 41 (2.4%) subjects and negative in 40 of 41 (97.6%) subjects. There were 136 (76.8%) subjects who worked as CSW for more than 1 year, and serum HBsAg were positive in 7 of 136 (5.1%) subjects and negative in 129 of 136 (94.9%) subjects.

Of the 177 female CSW in this study, condom usage were found in 110 (62.1%) subjects, and serum HBsAg were positive in 1 of 110 (0.9%) subjects and negative in 109 of 110 (99.1%) subjects. There were 67 (37.9%) subjects who did not use condom and serum HBsAg were positive in 7 of 67 (10.4%) subjects and negative in 60 of 67 (89.6%) subjects (table 1).

The results of Z test revealed that prevalence of hepatitis B in female CSW were high, because the result of 4.5% was not much different from the one found by some other studies (2-5%).¹⁰

Result of correlation coefficient test showed that Phi (ϕ) indicated relationship between intercourse frequency and prevalence of hepatitis B, but the relation was not statistically significant ($p = 0.158$).

The result of correlation coefficient testing Phi (ϕ) showed that there was relationship between the number of sexual partner and prevalence of hepatitis B, but the relation is not statistically significant ($p = 0.151$).

The result of correlation coefficient testing Phi (ϕ) showed that there was a relationship between duration of working as CSW and prevalence of hepatitis B, but statistically insignificant ($p = 0.464$). Phi (ϕ) testing the relationship between condom usage and hepatitis B

The result correlation coefficient Phi (ϕ) testing showed that there was a significant relationship

between non condom usage and prevalence of hepatitis B ($p < 0.001$) (table 1)

DISCUSSION

Hepatitis B virus has long been known as sexually transmitted infection since more than 25 years ago.¹¹ Virus particles can be found in the blood, saliva, semen, and vaginal secretions, making it easily transmitted.^{11,16}

In the US and other countries with low prevalence of hepatitis B, sexual activities either heterosexual and homosexual is the most frequent mode of transmission. Recent studies showed that 40-50% of hepatitis B can be transmitted sexually in the low to moderate prevalence rate area.^{12,13} High risk group are the commercial sex worker, and factors that may influence the increased transmission rate of the hepatitis B virus infections are frequency of sexual contact, number of sexual partners, duration of working as sex worker and history of other sexually transmitted diseases.^{11,12,13,14,15,16}

The prevalence of hepatitis B virus in Indonesia is very variable between 2.5-20%.^{9,10} According to WHO classification, this data indicate that Indonesia is classified as moderate to high endemic area. Sulaiman,⁹ conducted a test on 5,009 blood samples of employees of Cipto Mangunkusumo hospital and found HBsAg positive in 4.5% and also prevalence of HBsAg in blood donor in Indonesia (Java) was 5.5%, outside Java was 8.0%. Kokasih et al,¹⁷ found the prevalence of HBsAg positivity as high as 6% in 200 blood donors of Pirngadi hospital.

Some studies,¹⁰ found the prevalence of hepatitis B in Indonesia was between 2-5%. In this study, of 177 female CSW, the prevalence of HBsAg was 4.5%. The most frequent age group was 20-24 year (31.6%), mean age 27.87 year, educational status were mostly in senior high school level (39.0%), marital status was mostly married (65.5%), place of activity was mostly on the streets (79.1%), and condom usage was 62.1%.

In other study, Smikle et al,¹⁸ conducted a study on 485 (197 male and 288 female) consecutive patients presenting at the comprehensive health centre, the STD clinic in Kingston, Jamaica, and found the prevalence of HBsAg of 3.2%. Gibney et al,¹⁹ performed a study in Bangladesh on 384 female who are not CSW but whose sexual contacts may include men at high risk for STD and found prevalence of HBsAg of 3.6%, mean age 27.4 years old, most age group at 20-24 year, and married status in 80.7%. Pando et al,¹⁹ studied 625 female CSW in Argentina and found HBsAg prevalence of 4.9%, place of activity mostly on the streets in 64.5%, and couples who used condom regularly were 81.9%.

Risk factors of getting hepatitis B virus in female

CSW is frequency of sexual contact, number of partners, duration of working as CSW, needle sharing, and blood transfusion, condom usage and depends on immunity and prevalence of HBsAg of her sexual partners or clients.^{3-9,12,16}

In this study, risk factors that were tested including frequency of sexual intercourse, number of partners and duration of working as CSW. The results of statistical test showed that there were relationships but statistically not significant. Those results were similar with findings in the study conducted by Russi et al,¹² in Uruguay on 200 female CSW, with HBsAg seroprevalence of 3% and also risks factors such as frequency of sexual contact and number of sexual partners showed a relationship with HBsAg but not statistically significant, while duration of working as CSW for more than 5 years had a significant relationship with hepatitis B. This finding may be due to the low prevalence of HBsAg in the general population, but no data were available and also most of them had used condom and not many of them were drug abuser. A study on the prevalence of HBsAg and anti-HBc in the general population may be needed with larger number of samples.

This study also found that there was high significant relationship between non condom usage and the prevalence of hepatitis B ($p \leq 0.005$).

CONCLUSION

Prevalence rate of hepatitis B in female CSW in Manado was 4.5%. There was relationship between frequencies of sexual contact, number of sexual partners, duration of working and prevalence of hepatitis B, but was not statistically significant. There was a high significant relationship between non condom usage and the prevalence of hepatitis B.

RECOMMENDATION

A study in the general population regarding the prevalence of hepatitis B in Manado with a larger number of samples is needed. The education of condom usage as protection for a safe sex is necessary.

REFERENCES

1. Hendra Rahardja. Hepatitis B. Dalam: Sulaiman Ali, Daldiyono, Nurul Akbar, Aziz Rani. Gastroentero-hepatologi. Info-Medika Jakarta 1990:253-75.
2. Lee WM. Hepatitis B infection. *NEJ Med* 1997;337: 1733-45.
3. Hepatitis B. WHO 2004;2:3-75.
4. Tran TT, Martin P. Hepatitis B: Epidemiology and natural history. *Clin Liver Dis* 2004;8:255-66.
5. Alter MJ. Epidemiology and prevention of hepatitis B. *Seminar in Liver Disease* 2003;23:39-46.
6. Miller J, Finelli L, Bell BP. Incidence of acute Hepatitis B- United States, 1990-2002. *MMWR* 2004;52:1252-54.
7. Merican I, Guan R, Amorpuka D, et al. Chronic hepatitis B virus infection in Asian countries. *J Gastroenterol Hepatol* 2000;15:1356-61.
8. Sulaiman Ali H, Julitasari. Epidemiology hepatitis B di Indonesia. Dalam: Sulaiman A, Julitasari. Virus hepatitis A sampai E di Indonesia. Yayasan Penerbit Ikatan Dokter Indonesia 1995.h.16-76.
9. Soemohardjo S. Epidemiologi infeksi virus hepatitis B. Dalam: Sulaiman A, Daldijono, Nurul Akbar, Aziz Rani. Gastroentero-hepatologi. Info Medika, Jakarta 1990:276-84.
10. Tran TT, Martin P. Hepatitis B: Epidemiology and natural history. *Clin Liver Dis* 2004;8:255-66
11. Buccolo LS. Viral hepatitis. *Clinics Family Practice* 2005;7:105-25.
12. Russi JC, Serra M, Vinales J, et al. Sexual transmission of hepatitis B virus, hepatitis B, and human immunodeficiency virus type 1 infections among male transvestite commercial sex workers in Montevideo, Uruguay. *Am J Trop Med Hyg* 2003;68:716-20.
13. Atkins M, Nolan M. Sexual transmission of hepatitis B. *Curr Opi Infec Dis* 2005;18:67-72.
14. Takeda K, Ikeda S, Suganuma N, et al. Differential seroprevalences of hepatitis C virus, hepatitis B virus and human immunodeficiency virus among intravenous drug users, commercial sex workers and patients with sexually transmitted diseases in Chiang Mai, Thailand. *Hepatology Research* 2003;27:6-12.
15. Figueroa JL, Slas FU, Gles CC, et al. Low prevalence of hepatitis B markers among Mexican female sex workers. *Sex Trans Inf* 1998;74:448-50.
16. Himbawani M, Widjaja S, Hartadi, Haldar. Hepatitis virus B dalam hubungannya dengan penyakit menular seksual. *Majalah Kedokteran Diponegoro* 1993;3:311-25.
17. Kokasih EN, Sukiman I. Vaksinasi terhadap hepatitis B. *Cermin Dunia Kedokteran* 1992;81:53-6.
18. Smikle M, Dowe G, Wlilliams E. Hepatitis B and C and sexually transmitted disease patients in Jamaica. *Sex Transm Inf* 2001;77:295-96.
19. Gibney L, Macaluso M, Kirk K, et al. Prevalence of infectious diseases in Bangladeshi women living adjacent to a truck stand: HIV/STD/hepatitis/genital tract infections. *Sex Transm Inf* 2001;77:344-50.
20. Pando MA, Berini C, Bibini M, et al. Prevalence of HIV and other sexually transmitted infections among female commercial sex workers in Argentina. *Am J Trop Med Hyg* 2006;74:233-38.