Prevalence of HBsAg and Anti-HCV among HIV-infected Injecting Drug Users in the Northern Region of Thailand

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Abstract

In 2017, World Health Organization (WHO) reported the burden of HIV-Anti-HCV co-infection that are 2.75 million of whom 1.3 million are Injecting Drug Users (IDUs). As for HIV- HBsAg co-infection estimated around 2.6 million. The burden of these co-infections are greatest in the African and South East Asia Regions. The northern region of Thailand is the top of high prevalence HIV infection. It is bloodborne viruses transmitted primarily through sexual contact and injection drug use. Moreover, the transmission routes are the same at risk for Hepatitis B Virus Infection (HBsAg) and Hepatitis C Virus Infection (Anti-HCV). This study was aimed to assess the situation and prevalence of HBsAg and Anti-HCV co-infection with HIV among IDUs. The study was carried on in Chiang Rai, Chiang Mai, and Phayao Provinces. Cross-sectional study design was complete collected through questionnaire and blood sample with used standard respondent-driven sampling technique (SRD). The prevalence of HBsAg and Anti-HCV among HIV patients with IDUs in 2015 were found 13.4%, 77.6% of 67 cases respectively. The HIV co-infection was found 9% (male 74.3%). There was only 17.9% of received hepatitis treatment. This study may guide the planning to treat HBsAg and Anti-HCV among HIV patients with IDUs and form or shape a surveillance program to prevent all in case of patient and others. It can then be expected that the vaccine developing has opportunity to be successful.

Keywords : HBsAg with HIV, Anti-HCV with HIV, Injection drug users (IDUs)

Introduction

Throughout the 30 years, the one cause of death was identified HIV infection. In 2016, the number of HIV infected in worldwide were about 36.7 million people. One point eight million people were newly HIV infected and 1 million people were death cases. The burden are greatest around 25.6 and 3.5 million in the African and South East Asia Regions respectively[1]. In South East Asia Regions, the highest of HIV infected were India, Indonesia, Thailand, Myanmar and Nepal. Thailand is the only country that found the highest prevalence rates in excess of 1%[2]. The main causes of the HIV infection are unsafe sexual intercourse especially in homosexuality and needle-sharing among injecting drug users. Similarly, bloodborne viruses transmitted are Anti-HCV and HBsAg and some cases can be co-infectious with HIV. As for route of contact among HIV, HBsAg and Anti-HCV have a similar contact form. The burden of HIV- Anti-HCV co-infection that are 2.75 million of whom 1.3 million are Injecting Drug Users (IDUs). As for HIV- HBsAg co-infection estimated around 2.6 million. The burden of these co-infections are greatest in the African and South East Asia Regions[3]. In addition, Northern of Thailand reported for the most cases of HIV infection 50 persons per hundred thousand people. There are the area where has the highest number of AIDS patients especially Chiang Rai, Chiang Mai and Phayao. This problem is a direct impact on the economy and quality of life in the community, because there are the tourist areas with a large number of visitors in each year. Thus it is essential to study the HBsAg and Anti-HCV with HIV [4]. In general, the three blood-borne viruses (HIV, HBsAg and Anti-HCV) co-infection are common among IDUs. The prevalence of at least one of the three infections and co-infection with all three viruses were high concerned among IDUs. Furthermore, co-infection of HIV with HBsAg and Anti-HCV increases the morbidity and mortality and changes the natural history[5]. The chronic hepatitis has the effects on the use of ARV drug therapy. It reduces drug efficacy and makes more severe hepatitis also. In addition, the increase of tourists in a state of world community is cause of the outbreaks of various diseases easily. The more number of foreign tourists will make more entertainment areas and more drug use as well[6]. Thus, the North region have risk chance occurring. The study in Tanzania founded 14% of MSM and 66% of IDUS co-infection with others virus that infected by blood such as HIV/AIDS, HBsAg, and Anti-HCV. Moreover, the result reported 22% prevalence of HIV in IDUs group, 29.6% of HBV with HIV, and 3.8% of Anti-HCV with HIV[7]. Furthermore, the northern is the area of popular addictive substance such as heroin and amphetamine. In 2011, Ministry of Public Health in Thailand reported 39.33 the incident rate of HIV/AIDS in IDUs. Besides, the importance of co-infectious is the mutation infection[8]. Therefore, the

specific objective of this study was aimed to assess prevalence of HBsAg and Anti-HCV among HIV-infected Injecting Drug Users in Northern Thailand. Comprehensive prevention service is the expectation through the implementation in IDUs cases especially in high prevalence area and some limited to assess service[9].

Materials and Methods

This study was used a cross sectional study to collect data from Antiretroviral (ARV) Clinic in 31 of 51 hospitals where were purposive selected and willing to participate from Chiang Rai, Chiang Mai, and Phoyao province. In Chiang Rai province were 11 districts including Mae Chan, Mae Sai, Weing Chiang Rung, Phan, Mae Suai, Wiang Pa Pao, Khun Tan, Chiang Khong, Weing Chai, Mae Laos, Phaya Meng Rai. As for Chiang Mai province, districts were 14 including of San Kamphaeng, San Sai, Saraphi, Chom Thong, San Pa Tong, Doi Tao, Doi Saket, Hang Dong, Fang, Phrao, Mae Taeng, Hot, Omkoi and Doi Lo. The last of Phayao province, there are 6 districts including Chiang Come, Pong, Chun, Chiang muan, Dok Khamtai, and Mae Jai. The data were collected in one year of 2015. Standard respondent-driven sampling technique (RDS) was used to select the participants. The participants were recruited HIV patients who were Injection Drug Users (IDUs) and lived in area setting at least one year. Exclusion criteria was separated who cannot Thai communicate and get severe or complication of diseases. The samples of this study were IDUs cases who were first diagnosed with HIV positive before and until 2015 and had visited at least once in the selected antiretroviral (ARV) clinics. HBsAg and Anti-HCV infection were confirmed by having one or more positive tests for HBsAg and Anti-HCV serology. The data was complete collected by validity and reliability questionnaire. The validity was validated by three external experts before used. It was adjusted if the score was less than 0.5 in the Item Objective Congruence Index method. Zero point eight one of Cronbach's alpha was tested among 30 patients with test-retest reliability method before use. A structured questionnaire was interviewed the participants about socio-demographic characteristics, medical history, risk behaviors and sexual behaviors. Besides, it consists of medical records for general information and added fact-to-fact technique to interviews. The blood samples collecting were obtained from each subject in 5 milliliters of venous blood. All participation process runs on ARV clinic in hospital. The lab results analyzed the hepatitis B surface antigen (HBsAg) and hepatitis C antibody (anti-HCV) by ELISA test and Anti-HIV by ELISA HIV-1. HBsAg and HCV Ab+ were detected by NIBSC 00/588; WHO 2nd International Standard for HBsAg, subtype adw2, genotype A; UI/mL with 99.9% specificity and 99.8% sensitivity[10] and hepatitis C antibody (Anti-HCV) by cobase 411 analyzer, Elecsys® 2010 analyzer: 4.2 - 5.2%

with100.0% sensitivity and 99.6% hospitalized patients clinical specificity[11]. Descriptive statistics for continuous variable and frequency (percentages) for categorical variables were used to describe the characteristics of the study population. Chi-square and Fisher`s exact test was used to determine the association. The results were considered significant when the p-value less than 0.05. Ethical consideration was received from the Ethics in Human Research Committee of Mae Fah Luang University (No. 5/2557). Permission of performing the study was also obtained from the Provincial Chief of Public Health Office for Phayao, Chiang Maiand Chiang Rai. Samples were informed about the research and could ask any questions until they are not doubt about the study. Then, they signed an informed consent form before answering the questionnaires and collecting blood samples.

Results

A total of 67 participants completed the questionnaire. Table 1 showed characteristics of HIV/AIDS among Injection drug users (IDUs). The majority was found the significant of HIV/AIDS and Anti-HCV in Chiang Mai and Chiang Rai Provinces. The prevalence rate of HIV/AIDS and HBsAg and Anti-HCV among Injection Drug Users (IDUs) from collecting data founded 7.5% of HBV co-infection with HIV/AIDS and 31.3% of Anti-HCV with HIV/AIDS.

Table 1 Characteristics of HIV/AIDS among Injection drug users (IDUs) in the northern region of Thailand.

	Characteristics	Number	Percent
Provinces	Chiang Mai	36	53.7
	Chiang Rai	20	29.9
	Phayao	11	16.4
Ages	25-36	13	19.4
	37-48	48	71.6
	49-60	6	9.0
Genders	Male	62	92.5
	Female	5	7.5
Occupations	Employee	42	62.7
	Agricultures	14	20.9
	Entrepreneur	4	6.0
	Unemployed	4	6.0
	Government officer	1	1.5

Table 1 Characteristics of HIV/AIDS among Injection drug users (IDUs) in the northern region of Thailand.

	Characteristics	Number	Percent
	Self-business	1	1.5
	Monk	1	1.5
Religions	Buddhism	53	79.1
	Christian	14	20.9
Tribal groups	Thai	49	73.1
	Karen	9	13.4
	Akha	4	6.0
	Lahu	2	3.0
	Chinese	2	3.0
	Yao	1	1.5
Marital status	Married (and not separated)	31	46.3
	Single	26	38.8
	Separated	4	6.0
	Widowed	3	4.5
	Divorced	3	4.5
Educations	Illiteracy	13	19.4
	Primary School	26	38.8
	Secondary School	28	41.8
Smoking status	Nonsmoking	9	13.4
	Smoking	58	86.6
Alcohol drinking	Nondrinking	32	47.8
	Drinking	35	52.2
Getting tattoo	No	31	46.3
	Yes	36	53.7
Drug abuse used	No	17	25.4
	Yes	50	74.6
Routes of drug administration			
	Oral (eat/chew/sublingual/drink)	1	1.4
	Smoking	5	6.8
	Injections (subcutaneous/ muscle/vein)	67	91.8

However, the lab results repeated HBsAg, anti-HBeAg, anti-HCV by ELISA test and Anti-HIV by ELISA HIV-1 that showed adding 4 cases of HBV co-infectious and 31 cases of HCV co-infectious to responsible for 13.4% and 77.6% respectively. Moreover, all co-infection is reported 9% of all participants as the result showed in Table 2.

Table 2 The prevalence rate of HIV/AIDS and HBsAg and Anti-HCV among Injection Drug Users (IDUs).

	All cases		Non- HBsAg & Anti-HCV		HBsAg		Anti-HCV		HBsAg & Anti-HCV co-infection with HIV	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Genders										
- Male	62	92.5	2	2.9	9	13.5	45	67.2	6	9.0
- Female	5	7.5	2	2.9	0	0	3	4.5	0	0
Provinces										
- Chiang Mai	36	53.7	1	1.5	4	5.9	29	43.3	2	2.9
- Chiang Rai	20	29.9	2	2.9	3	4.5	12	18.0	3	4.5
- Phayao	11	16.4	1	1.5	2	2.9	7	10.6	1	1.5
Total	67	100								

There were only 17.9% received hepatitis treatment. The most of cases was diagnosed HIV infection in mean period of 8.4 ± 5.1 years. From Table 2, the prevalence of HBsAg was estimated 13%, Anti-HCV was around 71% and all tree viruses' infection was 9%. The most of case is male (62 samples) and they were reported all infection of HBsAg. Sixty seven point two percentage was prevalence of Anti-HCV in male cases. Besides, the all co-infectious in male was 6 samples. Chiang Mai was the half of cases report in this study and there are 5.9% of HBsAg and 43.3% of Anti-HCV, whereas all co-infection reported the most highest in Chiang Rai at 4.5%. However, the statistical significant was not show because limited of participants.

Discussions

As for Millennium Development Goal 6 'halting the spread of HIV', Thailand is considered an early achiever. There has not been a consistent decline in HIV incidence across all segments of the population in recent years. The first few years of Thailand's

epidemic, HIV prevalence among IDUs rose from 0 to 40% at risk of HIV infection using unsafe injection methods. The study of Degenhardt et. al. (2016) estimated DALYs attributable that were 10.08 million to previous exposure to HIV, HBsAg, and Anti-HCV via IDU, a four-times increase since 1990. Co-infectious of IDU-and HIV burden was highest in low-to-middle-income countries, and IDU-attributable Anti-HCV burden was highest in high-income countries[12]. According to Hayashi et. al. (2013) study founded 468 IDUs enrolled project in Bangkok[8]. The results revealed syringe sharing remain and widespread among population as the same prevalence increasing of HBsAg and Anti-HCV with HIV in Yunnan, China of Zhou et. al. (2012) study[13]. A higher proportion of women reported several other risk factors for hepatitis C acquisition, including having an injection drug-using partner (10.2%) and ever having been a commercial sex worker (7.8%). Factors associated with pregnant women being Anti-HCV infected included more education, intravenous drug use, having a partner with a history of injection drug use, ever having been a commercial sex worker, and having received a blood transfusion. These risk factors remained significant when adjusting for perinatal study[14]. However, factor of tribal group or ethnicity was not significantly as the same result of Oramasionwu et. al.[15]. The similarly Garten et.al. (2005), study co-infection with HIV and Anti-HCV was found in 17.6% of the IDUs. Anti-HCV was present in 95.1% of HIV-positive and 70.4% of HIV-negative heroin users. The prevalence of HIV in Anti-HCV among heroin users was 23.4% and 3.6%, respectively[16]. Multivariate logistic regression analysis revealed that sexual activity during the past 6 months and duration of injection drug use were significantly associated with co-infection with HIV and Anti-HCV [16, 17]. From the cohort study as a total of 3,089 adults, whom 341 (11.0%) were co-infected with HBV and 163 (5.3%) with Anti-HCV. Over a median ART follow-up time of 4.3 years, 240 individuals died. Mortality was 1.6 higher for HBV co-infection in adjusted analysis (P = 0.010). After the first year of ART, the independent mortality risk was 3 fold increased in Anti-HCV (P = 0.002). A total of 180 (5.8%) individuals discontinued Efavirenz or Nevirapine due to severe livertoxicity, with an independently increased risk for HBsAg. Part of CD4 in this study contrasted with Grady et. al. (2016) which of no significantly[18]. The adding from Berenguer and other (2016) study[19], they pointed the function of liver and explained the liver disease and liver cirrhosis that the result should highlight. It is the main features of active Anti-HCV and liver cirrhosis. The importance of Anti-HCV prevention is the way to reduce the risk of transmitting and minimizing their risk for Anti-HCV -related complications as WHO's published guideline to use messages for people with high-risk drug-using practice[20]. Moreover, co-infections in Mijiti

et. al. (2016) study reported effect on high risk of mortality, which should be assessed in further study[21].

This surveys had a number of limitations. First, we cannot verify that all participants met the study inclusion criteria and it is possible that control participated. To reduce the possibility of recruiting non-eligible persons, we trained staff to ask participants of screening questions. However, interviewers were trained to make participants feel comfortable during the interview process and the high levels of sensitive risk behaviors disclosed suggest that this was not a major source of bias. Second, the answer of participant was recall that may happen in bias. To reduce the recall bias, we confirmed the data with medical record. However, we believe this study findings are valid, in that the diverse seeds selected by SRD technique were effective. This study, there was no significant between the prevalence of infections or co-infections and risk factor at all. The suggestion to set in future should select more samples and separate in case and control.

In conclusion, a prevalence of HBsAg and Anti-HCV with HIV/AIDS among Injection drug users (IDUs) was observed among our sample positive. The most case is Anti-HCV with HIV/AIDS. This study may guide the planning to treat HBsAg and Anti-HCV with HIV/AIDS among IDUs. Based on these results, the strategies of health should be considered as important additional strategic tool as part of a comprehensive package of effective HIV prevention interventions, particularly among IDUs practicing high-risk behaviors.

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