The prevalence of blood borne diseases in the community (A cross sectional study in the district of semarang)

by Henry Setyawan Susanto

Submission date: 23-Nov-2021 11:40AM (UTC+0700)

Submission ID: 1710861263

File name: mmunity_A_cross_sectional_study_in_the_district_of_semarang.pdf (347.66K)

Word count: 3288

Character count: 16659

The Prevalence of Blood Borne Diseases in the Community (A Cross Sectional Study in the District of Semarang)

Lintang Dian Saraswati¹, Henry Susanto², Ari Udiyono², Praba Ginandjar¹, Teguh Winarno³

¹Department Epidemiology and Tropical Dise 18 s, Faculty of Public Health, Diponegoro University, Semarang, Indonesia, ²Master Program of Epidemiology, School of Postgraduate Studies Diponegoro University, Semarang, Indonesia, ³Blood Transfusion Unit, Indonesia Red Cross District of Semarang, Ungaran, Indonesia

ABSTRACT

Blood borne disease is a disease that spreads through blood contamination. Pathogenic blood-borne pathogens are pathogenic microorganisms found in human blood (such as viruses, bactaria or parasites) and are capable of causing disease in humans. Blood-borne pathogens in general are hepatitis B virus, hepatitis C virus and Human Immunodeficiency Virus (HIV). However, it is rarely known data about them in community. This study aims to determine the prevalence of some diseases that are transmitted through the blood in the community that lived at the district of Semarang. This research was descriptive observational using a cross sectional approach. HIV are tested by using the CLIA (Chemi Lumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where HIV with anti HIV. HCV and HBV are tested by using the CLIA (Chemi Lumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where Hepatitis B with antigen (HBsAg) and Hepatitis C with anti HCV. The research subject is the population who live in the district of Semarang for at least one year. Samples were taken by using simple random sampling method. The number of blood samples obtained from 1421 people who have filled informed consent and stated willing to be the subject of research. The results showed that the prevalence of HIV was 0.9 per 100 population, prevalence of hepatitis B was 1.9 per 100 population, and prevalence of Hepatitis C 0,6 per 100 population. There was moderate prevalence of blood borne diseases in community. There are some factors related to the transmission of blood borne diseases in the community that need to determine further.

Keywords: HIV, HCV, HBV, Blood borne, Prevalence

INTRODUCTION

Blood-borne are transmitted by direct blood contact from injured skin or a mucous membrane [1]. The blood-borne pathogen is generally repatitis B virus, hepatitis C rirus and human immunodeficiency virus (HIV) [2-9]. Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV) still cause high burdens of disease in developing countries. For example, 184 million and 248 million individuals worldwide are chronic carriers of HCV and HBV, respectively [10-12].

Corresponding author:

Lintang Dian Saraswati, Department Epidemiology and Tropical Diseases, Public Health Faculty, Diponegoro University, Jl. Prof. Sudarto, SH,Tembalang, Semarang, 50275.
Email: lintang.saraswati@live.undip.ac.id

Around 37 million individuals are living with HIV/acquired immunodeficiency syndrome (AIDS) globally [13-14]

HIV is a major public health problem of the global content of the

Blood-borne diseases can spread through organ transplants, sharing needles with others in activities such as tattoos and body piercings, blood or blood products donated as in blood transfusion activities [17-21]. Based on research conducted in eastern India, there are 44,173

blood sample was collected, and tested HIV I and II, atitis B, and hepatitis C. From the test results found that 283 tested positive for HIV (0.64%), 1001 HbsAgpositive (2.27%), And 717 positive for HCV (1.62%) [22]. While research conducted by Baha W et al. on volunteers and the community in Morocco, found seropositive HCV and HBV from 41,269 volunteers and 23,578 community [23]. In this study, found that the prevalence of anti-HCV increases and the various risk factors identified such as age, dental care, needle syringe and history of jaundice. In addition, male sex was associated with HB 23 infection and a history of risky sexual behavior were found to be associated with higher prevalence of hepatitis B [23].

According to Central Java Provincial Health Profile, in 2012 it was found out from 432,341 people who performed blood sampling as much as 432,148 (99.96%), 580 samples (0.13%) positive HIV.^[15] Health profile data of Central Java 2012 showed the number of new cases of HIV/AIDS wass 81/110 cases and hepatitis B disease in Central Java there are 98 cases^[15]

Until 2013 the prevalence rates for hepatitis B, hepatitis C and HIV continue to be found, respectively 0.012%, 0.003% 13d 0.002%. The purpose of this study was to estimate the prevalence of blood-borne diseases (hepatitis B, hepatitis C and HIV) in the district of Semarang.

METHODS

Study Design and Sampling Procedure

This research was descriptive observational using cross sectional approach conducted between January-July 2017. Population of this study were someone who live in the district of Semarang at least one year. Sample was selected by using simple random sampling.

Sample calculated by the formula of minimum sample size for cross-sectional study as follow:

$$n = \frac{\left(z_{1-\alpha/2}\sqrt{2\overline{P}(1-\overline{P})} + z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\right)^2}{(P_1 - P_2)^2}$$

With level of significance 95%, power of study 80%, obtained minimum sample size 500 respondents.

Samples were taken by using simple random sampling method using sampling framework of house hold residence of District of Semarang. The number of blood samples obtained from 1421 people who have

filled informed consent and stated willing to be the subject of research.

Instrument Development and Data Collection Procedure

Data collection was carried out in January-July 2017. In the process of collecting research data assisted by officers from the Indonesian Red Cross area of Ungaran for blood collection. Primary data obtained from interviews with respondents, helped by research assistance.

HIV are tested by using the CLIA (Chemi Lumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where HIV with anti HIV. HCV and HBV are tested by using the CLIA (Chemi Lumination Immuno Assay) and ELISA methods using Diasorin Murex reagents where Hepatitis B with antigen (HBsAg) and Hepatitis C with anti HCV.

Data Processing and Analysis

Data is presented as a percentage for categorical data and mean ± standard deviation for continuous data.

RESULTS AND DISCUSSIONS

Socio-demographic characteristics

Most of respondents who participated in this study were male (56.2%) with age <35 years (65.2%) with education level is graduated from high school (45.3%) and 53.5% were married. Most respondents work as non-government employees (53.2%). The hypertension status of the responsibility mostly are pre-hypertension (59.0%). All as seen in Table 1.

Table.1 Socio Demographic Characteristic of Subject (n=1421)

Charac-teristic		Freq- uency	%
Sex	Male	799	56.2
	Female	622	43.8
Marriage status	Married	760	53.5
	Single	638	44.9
	Widowed	23	1.6

Cont... Table.1 Socio Demographic Characteristic of Subject (n=1421)

Age	≥ 35 years	494	34.8
	< 35 years	927	65.2
Education	No formal schooling	5	0.4
	Primary school completed	28	2.0
	Less than secondary school	15	1.1
	Secondary school completed	346	24.3
	Less than high school	24	1.7
	High school completed	644	45.3
	Academy	123	8.7
	College/university completed	236	16.6
Occupation	Government employee	90	6.3
	Non-government employee	756	53.2
	Student	377	26.5
	Soldier/police	37	2.6
	Farmer	6	0.4
	Fisherman	2	0.1
	Merchant	26	1.8
	Self employed	9	0.6
	Others	118	8.3
Hypertension status	No hypertension	395	27.8
	Pre-hypertension	839	59.0
	Hypertension grade	166	11.7
	Hypertension grade 2	21	1.5

Result of our study showed that the respondents who donated blood is 67.9%, who had drugs abuse 0.5%, who had history of sexual intercourse with multiple partners is 54.5%, and 0,7% was male who have sex with male. While respondents who have sex with drug users is 0.4%.

There are 1.6% respondents that use permanent tattoo, and 6.1% use piercing. In addition, respondents also performed dental treatment, it is 16.1%. Respondents who had a history of surgery is 7.4%, and who get organ transplants is 0.5%. While respondents who received blood donor is 1.3%. (Table 2)

Table.2 High Risk Behavior Related with Blood Borne Disease Transmission (n=1421)

High Risk Behavior		Frequency	%
History of Blood Donor	Yes	965	67.9
History of Blood Dollor	No	456	32.1
History of Received Blood Transfusion	None	6	0.4
	Yes	18	1.3
	No	1397	98.3
History of drug abuse	Yes	7	0.5
	No	1414	99.5
History of Organ Transplantation	Yes	7	0.5
	No	1414	99.5
History of Surgery	Yes	105	7.4
	No	1316	92.6
History of Dental Treatment	None	1	0.1
	Yes	229	16.1
	No	1191	83.8
Had a permanent tattoo	None	2	0.1
	Yes	23	1.6
	No	1396	98.2
Had an ear/nose/body piercing	Yes	87	6.1
	No	1334	93.9
History of multiple sex partners	Yes	775	54.5
	No	646	45.5
Had homosexual partners	Yes	4	0.7
	No	567	99.3
Had a drug users as a sex partners	Yes	2	0.4
	No	426	99.6

This study revealed that mostly respondents were male with age no more than 35, completed high school and married. They work as non-government employees with status of hypertension are pre-hypertension. If compare with the research conducted in Ghana to the blood volunteers, the results stated that most of the respondents were male 762 (94.3%) [24]. This is also in line with research from Janahi EM conducted in Bahrain



in 2000-2010 about the prevalence and risk factors of hepatitis B stated that several sociodemographic variables were significantly associated with the prevalence of hepatitis B virus infection [25]. Age was one of sociodemographic factor that related to the prevalence of hepatitis B infection. It significantly increased among the age groups 25-34 and 35-44 (p<0.0001) [25]. While research conducted by ministry of justice and human rights stated that 52% was graduated from senior high school and married [26]. While study conducted by Apidechkul et al in Northern Thailand reported that respondents mostly males (15,0%), nearly half (40,3%) were 30-39 years old and nearly three quarters (62,9%) were married, and most of them were employed (89,5%) [27]. Another research conducted by Peck et al reported that among HIV infected patients there are 49,0% with had prehypertension status [28]. According to Arboli et al the hypertermon status among hiv infected patients related to age (adjusted hazard ratio [aHR] per 10 years: 1.34, 95% CI 1.07–1.68, p = 0.010), BMI (aHR per 5 kg/m2: 1.45, 95% CI 1.07–1.99, $p = 0.018^{[29]}$. From our study we know that respondents mostly have history of blood donors (67.9%), but most of them never receive blood transfusion (98,8%). Just a few of them had history of drug abuse (0.5%), had history transplantation (0.5%), and had history of surgery (7.5%). We found that 16.1% had history of dental treatment, 1.6% of them had permanent tattoo, and nearly 6.1% had ear/nose/body piercing. And we also found that nearly half of them (54.5%) had multiple sex partner, 0.7% had homosexual partners. Beside that they also had sexual intercourse h drug users but just a few (0.4%). If compare to research conducted by Awadalla et al in Egypt reported that respondent who had surgical treatment was 22.5%, who received blood transfusion was 7.5%, while who performed dental treatment was 74.6% [30,31]. This research also reported that respondent who have sexual relations was 8,5%, while who use tattoo was 31,3%, and who had drug abuse was 5.9% [31]. While study conducted by Apidechkul in Northern Thailand reported that 23.5% respondents had history of a blood transfusion, 0.8% were intravenous drug user, 29.8% tattooed, 64.5% had body piercing, and 6,5% were homosexual [27]. If compare to research conducted by Srigayatri et al among hiv and hepatitis c co-infection reported that respondents who had blood transfusion was 20.6%, who had history of dialysis was 2.7%, who had tattoo 52.9%. The study also reported about the sexual risk factors [32]. The result showed that respondents mostly (68.5%) was

homosexual and 71.6% having sex with unprotected anal intercourse. While more than half of them (64.2%) having sex with intravenous drug user^[32].

CONCLUSIONS

There was moderate prevalence of blood borne diseases in community. There are some factors related to the transmission of blood borne diseases in the community that need to determine further.

Conflict of Interest: The author reports no conflicts of interest in this work.

Acknowledgement: The authors thank to Faculty of Public Health Diponegoro University for funding this study (number: SP DIPA 22/UN7.5.1/PG/2017). The authors also thank the study participants, District Health Office of Semarang with all their Primary Health Centre for their cooperation in facilitating the study.

Ethical Clearence: Ethical clearance was obtained from Ethic Commission of Health Research, Faculty of Public Health UNDIP (112/EC/FKM/2017). All subjects signed informed consent to join the study.

REFERENCES

- Pirozzolo JJ, LeMay DC. Blood-Borne Infections. Clin Sports Med 2007;26(3):425–31.
- American Academy of Orthopaedic (AAOS). Bloodborne Pathogens. 5th ed. American College of Emergency Physician; 2008.
- Khalil S da S, Khalil OAK, Lopes-Júnior LC, Cabral DB, Bomfim E de O, Landucci LF, et al. Occupational exposure to bloodborne pathogens in a specialized care service in Brazil. Am J Infect Control 2015;43(8):e39–41.
- Lee R. Occupational transmission of bloodborne diseases to healthcare workers in developing countries: meeting the challenges. J Hosp Infect 2009;72(4):285–91.
- Scharf BB, McPhaul KM, Trinkoff A, Lipscomb J. Evaluation of home health care nurses' practice and their employers' policies related to bloodborne pathogens. AAOHN J 2009;57(7):275–80.
- Mbaeyi C, Panlilio AL, Hobbs C, Patel PR, Kuhar DT. Assessment of Management Policies and Practices for Occupational Exposure to Bloodborne Pathogens in Dialysis Facilities. Am J Kidney Dis 2012;60(4):617–25.

- Eboumbou Moukoko CE, Ngo Sack F, Essangui Same EG, Mbangue M, Lehman LG. HIV, HBV, HCV and T. pallidum infections among blood donors and Transfusion-related complications among recipients at the Laquintinie hospital in Douala, Cameroon. BMC Hematol 2014;14(1):5.
- Camacho-Ortiz A, Díaz-Rodríguez X, Rodríguez-López JM, Martínez-Palomares M, Palomares-De 28 Osa A, Garza-Gonzalez E. A 5-year surveillance of occupational exposure to bloodborne pathogens in a university teaching hospital in Monterrey, Mexico. Am J Infect Control 2013;41(9):e85–8.
- Bollin M, Murry L. Reducing exposure risk in the operating room. Prairie Rose 2008;77(2):10–3.
- iohd Hanafiah K, Groeger J, Flaxman AD, Gersma ST. Global epidemiology of hepatitis C virus infection: New estimates of age-specific antibody to HCV seroprevalence. Hepatology 2013;57(4):1333-42.
- Schweitzer A, Horn J, Mikolajczyk RT, Krause G, Ott JJ. Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013. Lancet 2015;386(10003):1546–55.
- Petruzziello A, Marigliano S, Loquercio G, Cozzolino A, Cacciapuoti C. Global epidemiology
 hepatitis C virus infection: An up-date of distribution and circulation of hepatitis
 virus genotypes. World J Gastroenterol 2016;22(34):7824–40.
- 13. Pewman L, Rowley J, Vander Hoorn S, Wijesooriya S, Unemo M, Low N, et al. Global Estimates the Prevalence and Incidence of Four Curable Sexually Transmitted Infections in 2012 Based on Systematic Review and Global Reporting. PLoS One 2015;10(12):e0143304.
- World Health Organization. Global Health Observatory: HIV/AIDS. Geneva, Switzerland: 2017.
- World Health Organization. Media Center: HIV/ AIDS. Geneva, Switzerland: World Health Organization; 2017.
- World Health Organization. Media Center: Hepatitis C. Geneva, Switzerland: World Health Organization; 2017.
- 17. Government of Alberta. Alberta Sexually

- Trasmitted Infections and Blood Borne Pathogens Strategy and Action Plan 2011-2016. Alberta Heal. Web site2011;
- Abiona TC, Balogun JA, Adefuye AS, Sloan PE. Body art practices among inmates: Implications for transmission of bloodborne infections. Am J Infect Control 2010;38(2):121–9.
- Gallè F, Quaranta A, Napoli C, Di Onofrio V, Alfano V, Montagna MT, et al. Body art practices and health risks: young adults' knowledge in two regions of southern Italy. Ann Ig 24(6):535–42.
- Oei W, Janssen MP, van der Poel CL, van Steenbergen JE, Rehmet S, Kretzschmar MEE. Modeling the transmission risk of emerging infectious diseases through blood transfusion. Transfusion 2013;53(7):1421–8.
- 21. Tain J-P, Stramer SL, Carneiro-Proietti ABF, Martins ML, Lopes da Silva SN, Ribeiro M, et al. Transfusion-transmitted infectious diseases. Biologicals 2009;37(2):71–7.
- Sinha, S.K., Roychoudhury, S., Biswas, K., Biswas, P. dan Bandopadhay R. Prevalence of HIV, Hepatitis B, Hepatitis C and Syphilis in donor's blood: A study from eastern part of India. Ross Sci Publ 2012;
- 23. Baha W, Foullous A, Dersi N, They-they TP, alaoui K, Nourichafi N, et al. Prevalence and risk factors of hepatitis B and C virus infections among the general population and blood donors in Morocco. BMC Public Health 2013;13(50):1–8.
- ippofo W, Nii-Trebi N, Ansah J, Abe K, Naito H, Aidoo S, et al. Prevalence of blood-borne infectious diseases in blood donors in Ghana. J Clin Microbiol 2002;40(9):3523–5.
- Janahi EM. Prevalence and risk factors of hepatitis B virus infection in Bahrain, 2000 through 2010. PLoS One 2014;9(2):e87599.
- Ministry of justice and human rights of Indonesia.
 HIV and Syphilis Prevalence and Risk Behavior Study Among Prisoners in Prison and Detention Centres in Indonesia. Jakarta: 2010.
- Apidechkul T, Pongwiriyakul S. Factors associated with HIV and HBV co-infection in Northern Thailand. Asian Pacific J Trop Dis 2016;6(3):174– 8.
- 28. Peck RN, Shedafa R, Kalluvya S, Downs JA, Todd

- J, Suthanthiran M, et al. Hypertension, kidney disease, HIV and antiretroviral therapy among Tanzanian adults: a cross-sectional study. BMC Med 2014;12:125.
- Rodríguez-Arbolí E, Mwamelo K, Kalinjuma AV, Furrer H, Hatz C, Tanner M, et al. Incidence and risk factors for hypertension among HIV patients in rural Tanzania - A prospective cohort study. PLoS One 2017;12(3):e0172089.
- Awadalla HI, Ragab MH, Osman M a, Nassar N a. Risk Factors of Viral Hepatitis B among Egyptian Blood Donors. Br J Med {&} Med Res 2011;1(1):7–13.
- 31. Awadalla HI, Awadalla HI, Ragab MH, Nassar NA, Abd M, Osman H. RISK FACTORS OF HEPATITIS C INFECTION AMONG EGYPTIAN BLOOD DONORS. Cent Eur J Public Heal 2011;19(4):217–21.
- 32. Bollepalli S, Mat 2 son K, Bay C, Hillier A, Post J, Van Thiel DH, et al. Prevalence of Risk Factors for Hepatitis C Virus in HIV-Infected and HIV/Hepatitis C Virus-Coinfected Patients. Sex Transm Dis 2006;PAP(6):367–70.

The prevalence of blood borne diseases in the community (A cross sectional study in the district of semarang)

ORIGINA	ALITY REPORT			
SIMILA	2% ARITY INDEX	7 % INTERNET SOURCES	7% PUBLICATIONS	3% STUDENT PAPERS
PRIMAR	RY SOURCES			
1	www.ka	rger.com		1 %
2	WWW.eu	rosurveillance.c	org	1 %
3	Submitte Student Paper	ed to Universida	ad Cesar Vallej	0 1%
4	jeccr.bic	medcentral.cor	n	1 %
5	Submitte Student Paper	ed to University	of Sheffield	1 %
6	journal.u	unnes.ac.id		1 %
7	eprints.r	ners.unair.ac.id		1 %
8	Mohsen infection	Gadallah, Saha . "Association b n and cerebro-ca of a national po	etween hepati ardiovascular o	tis C disease:

survey in Egypt", Tropical Medicine & International Health, 2018

Publication

9	news.un.org Internet Source	<1%
10	www.thieme-connect.com Internet Source	<1%
11	A. Justin Rucker, Vignesh Raman, Oliver K. Jawitz, Kristen E. Rhodin, Betty C. Tong, David H. Harpole, Thomas A. D'Amico. "Impact of Time to Endoscopic Resection on Outcomes for Stage I Esophageal Adenocarcinoma", The Annals of Thoracic Surgery, 2021 Publication	<1%
12	pure.uva.nl Internet Source	<1%
13	www.encyclopedia.com Internet Source	<1%
14	"51st National Conference of Indian Society of Hematology & Transfusion Medicine (ISHTM) 2010, 18–21 November 2010, Kolkata, India", Indian Journal of Hematology and Blood Transfusion, 2010 Publication	<1%
15	Abdullah Al Mamun. "English Language Anxiety of Tertiary Level Learners in	<1%

Bangladesh: Level and Sources", English Language Teaching, 2021

Publication

16	Internet Source	< %
17	lakartidningen.se Internet Source	<1%
18	Fajrul Falakh, Onny Setiani. "Hazard Identification and Risk Assessment in Water Treatment Plant considering Environmental Health and Safety Practice", E3S Web of Conferences, 2018 Publication	<1%
19	Javad Yoosefi Lebni, Farbod Ebadi Azar, Manoj Sharma, Alireza Zangeneh et al. "Factors Affecting Occupational Hazards among Operating Room Personnel at Hospitals Affiliated in Western Iran: A Cross-Sectional Study", Journal of Public Health, 2020 Publication	<1%

Pilar Martín-Dávila, Francesca F. Norman, 20 Rogelio López-Vélez. "Chapter 55-1 Malaria in Transplant Candidates and Recipients: Diagnosis and Management", Springer Science and Business Media LLC, 2020

<1%

Publication

		< %
22	etd.aau.edu.et Internet Source	<1%
23	hdl.handle.net Internet Source	<1%
24	Chari Cohen, Alison A. Evans, Peixin Huang, W. Thomas London, Joan M. Block, Gang Chen. "Hepatitis B knowledge among key stakeholders in Haimen City, China: Implications for addressing chronic HBV infection", Hepatology, Medicine and Policy, 2016 Publication	<1%
25	Vincent J. Cornelisse, Christopher J. Sherman, Jane S Hocking, Henrietta Williams et al. "Concordance of chlamydia infections of the rectum and urethra in same-sex male partnerships: a cross-sectional analysis", BMC Infectious Diseases, 2017 Publication	<1%
26	ejournal2.undip.ac.id Internet Source	<1%
27	Ashita S. Batavia, Patrice Severe, Myung Hee Lee, Alexandra Apollon et al. "Blood pressure and mortality in a prospective cohort of HIV-	<1%

infected adults in Port-au-Prince, Haiti", Journal of Hypertension, 2018

Publication

28

Hudzaifah Al fatih, Wang Jing-Jy. "EXPLORING HEALTHCARE-ASSOCIATED INFECTIONS: KNOWLEDGE, ATTITUDE, AND BEHAVIOR OF EMERGENCY NURSES WORKING IN BANDUNG, INDONESIA", Belitung Nursing Journal, 2016

<1%

Publication

29

International Journal of Prisoner Health, Volume 9, Issue 2 (2013-06-08)

<1%

Publication

30

Kahila Bar-Gal, Gila, Myeung Ju Kim, Athalia Klein, Dong Hoon Shin, Chang Seok Oh, Jong Wan Kim, Tae-Hyun Kim, Seok Bae Kim, Paul R. Grant, Orit Pappo, Mark Spigelman, and Daniel Shouval. "Tracing hepatitis B virus to the 16th century in a Korean mummy", Hepatology, 2012.

<1%

Publication

Exclude quotes

Off

Exclude matches

Off