

BLOOD BORNE INFECTIONS AMONG HEALTHCARE WORKERS IN MONGOLIA

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BACKGROUND

Health care workers are at risk of infections associated with accidental exposure to blood, including viral hepatitis B (HBV), C (HCV) and human immunodeficiency virus (HIV). Mongolia is highly endemic country for viral hepatitis and the highest rate of HCC in the world.¹ The prevalence of HIV is low which estimated less than 0.1 percent among general population.² Although there have been conducted several studies regarding HBV and HCV infection, no nationwide survey conducted among health care workers in our country. We aimed to determine HBV, HCV and HIV infections and replication status among professionals working in all levels of healthcare organizations urban and rural areas of Mongolia.

METHODS

Our study was a cross-sectional design using stratified multistage, random cluster sampling from healthcare workers at all levels of healthcare settings throughout Mongolia. We enrolled 1,020 healthcare workers who were randomly selected from 4 geographical regions and capital city. Demographics, risk factors, HBV vaccination, personal and occupational exposures were collected using a standardized questionnaire. Serum sample was obtained each participants and stored at -80 °C for testing and transferred to NIH, USA. All samples were initially tested for anti-HBs, HBsAg, anti-HBc, anti-HCV, anti-HIV by ELISA (3.0 Ortho-Clinical Diagnostics, Raritan, NJ). The serum nucleic acid was evaluated by real time-PCR method used COBAS® AmpliPrep / COBAS® Taqman® HCV test, v1.0 and HBV test, v2.0.

RESULTS

Of the 1020 healthcare workers enrolled in the study 7% (n=71) were male and 93% (n=949) were female. 36.9% (n=375), 41.7% (n=424) and 21.4% (n=217) from all participants were enrolled from primary, secondary and tertiary level of healthcare service. There were 25.9% (n=261) doctors, 37.1% (n=378) nurses, 19.9% (n=202) medical technicians and 17.2% (n=175) housekeeping staffs. The rates of seropositivity were determined for anti-HBc, HBsAg, and anti-HCV as 68.2%, 7.6% and 21.9%, respectively. Out of all participants 0.7% (n=7) were positive with both HBsAg and anti-HCV. Among HBsAg positive subjects 89.7% were positive for HBV-DNA whereas 4.0% out of the HBsAg negative, but anti-HBc positive subjects were positive for HBV-DNA. 46.2% of all anti-HCV positive participants were positive for HCV-RNA. There was no positive case of HIV among participants enrolled in this study. Occupational exposures with needle stick injuries were highly prevalent among HCWs with an annual mean 2.33 times/ year.

Table 1. Hepatitis B serological test results

HBsAg	anti-HBc	anti-HBs	Interpretation	N	%
negative	negative	negative	Susceptible	123	12.1
negative	positive	positive	Immune due to natural infection	461	45.2
negative	negative	positive	Immune due to hepatitis B vaccination	179	17.5
negative	negative	<10mIU/mL	Non-response to vaccine	21	2.1
positive	positive	positive / negative	Chronically infected	78	7.6
negative	positive	negative	Interpretation unclear* four possibilities	158	15.5

Table 2. Prevalence of HBV and HCV by health care facilities, professional and working year

Variables	Total	anti-HBc (+)	HBsAg (+)	Anti-HCV(+)
		n (%)	n (%)	n (%)
Health care facility				
Family health center	139	83 (59.7)	8 (5.8)	31 (22.3)
Soum health center	236	169 (71.6)	19 (8.1)	45 (19.1)
District hospital	302	207(68.5)	29 (9.6)	70 (23.2)
Aimag hospital	122	86 (70.5)	7(5.7)	24 (19.7)
Clinical center	217	149 (68.7)	15 (6.9)	50 (23.0)
Professional				
Physicians	264	169 (64.0)	20 (7.6)	50 (18.9)
Nurse	378	261 (69.0)	28 (7.4)	86 (22.8)
Midlevel professionals	203	144 (70.9)	19 (9.4)	50 (24.6)
Housekeeping workers	175	122 (69.7)	11(6.3)	37 (21.1)
Working year				
Below 5	188	115 (61.2)	10 (5.3)	18 (9.6***)
6-10	151	100 (66.2)	11 (7.3)	15 (9.9)
11-15	127	94 (74.0)	10 (7.9)	23 (18.1)
16-20	124	91 (73.4)	4 (3.2)	30 (24.2)
21-25	162	110 (67.9)	14 (8.6)	42 (25.9)
26-30	143	99 (69.2)	15 (10.5)	50 (35.0)
Over 31	124	86 (69.4)	14 (11.3)	45 (36.3)

Table 3. Prevalence of HBV and HCV by occupational risk group

Occupational risk group	n (%)	OR	95% CI		P value
			Min	Max	
HBsAg					
Low risk	20 (6.8)	1			
Intermediate risk	30 (7.5)	1.1	0.61	1.973	0.76
High risk	28 (8.6)*	1.28	0.7	2.321	0.42
Anti-HCV					
Low risk	55 (18.8)	1			
Intermediate risk	93 (23.1)	1.297	0.89	1.885	0.17
High risk	75 (23.0)	1.288	0.87	1.903	0.2
HBsAg, Anti-HCV (+)					
Low risk	72 (24.7)	1			
Intermediate risk	119 (29.6)	1.285	0.91	1.808	0.15
High risk	103 (31.6)*	1.411	0.99	2.011	0.05

CONCLUSIONS

28.8% of all healthcare workers were positive with both HBsAg and anti-HCV or one of them. High replication rates were observed among HBsAg and anti-HCV positive subjects. No positive case of HIV was observed among health care workers.

REFERENCES

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- 2 Annual report 2016. National Center for Communicable Diseases.

CONFLICTS OF INTEREST

The authors do not have any conflict of interest

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