

Evaluation of Immune Response to Hepatitis B Vaccine in Healthcare Workers at Mongolia-Japan Hospital of Mongolian National University of Medical Science

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INTRODUCTION

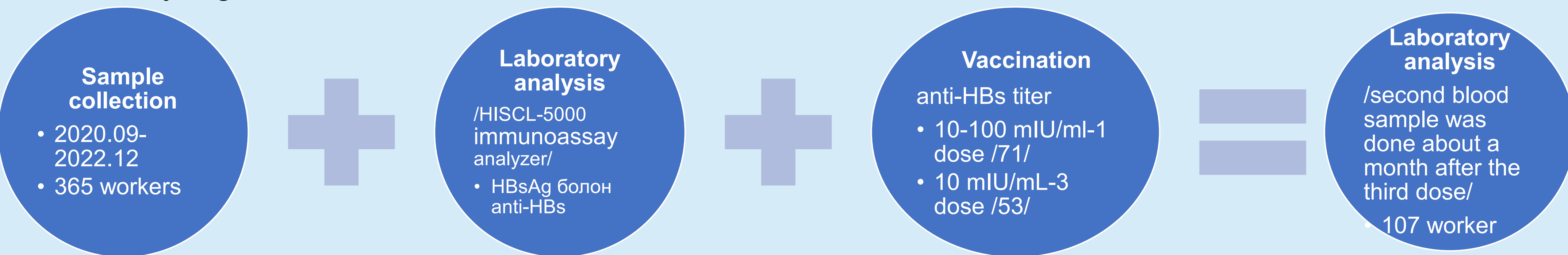
Hepatitis B is a become a long-term, chronic infection that can lead to serious, even life-threatening health issues like cirrhosis or liver cancer. Unvaccinated HCWs, the risk of acquisition of HBV infection after single exposure of HBV infected blood or body fluid ranges from 6%-30% which is preventable through hepatitis B vaccination. Healthcare workers (HCWs) are at high risk of acquiring hepatitis B virus infection through occupational exposure and immune response rates after HBV vaccination were not reported previously in Mongolian HCWs.

AIM

Study of immune response to hepatitis B vaccine among healthcare workers at Mongolia-Japan Hospital.

METHOD

From September 2020 to December 2022, Serum samples from 365 healthcare professionals were quantitatively analyzed for HBV markers (HBsAg, and anti-HBs). Those with negative HbsAg, and/or separate negative anti-HBs, were oriented to take the hepatitis B vaccine (rDNA, India), administered in triple doses of 20 mcg each of the antigens by intramuscular injection in the deltoid region, with a month interval between the first and second, and a five-month interval between the second and third dose. The collection of the second blood sample was done about a month after the third dose. Data was entered and statistical analysis was performed in SPSS version 23. In descriptive analysis percentages of categorical variables were reported. Bivariate comparisons were assessed using chi-square test and logistic regression. A p-value of < 0.05 was considered as statistically significant.



RESULTS

A total of 365 participated in the study, 68 men and 297 women, the average age was 36.7±9.4, and the average years of work was 10.1±8.5. 23.8% of the respondents work in low-risk, 53.4% in medium-risk, 22.8% in high-risk departments, 27.9% are doctors, and 31.2% are nurses.

Of the total participants, 4.9% (18) were HBV infected, with a mean HBsAb level of 177.9±403.5 mIU/ml. Of these 28.5% (104) had an anti-HBs titer between 10 and 100mIU/ml and the rest 33.2% (121) had an anti-HBs titer of >100 mIU/ml. 33.4% (122) did not develop a sufficient anti-HBs response. Based on the anti-HBs titer, 124 employees were vaccinated, 19.5% (71) received 1 dose and 14.5% (53) received 3 doses. Overall, 96.3% of the vaccinated HCWs developed protective immunity to hepatitis B. Of these 10.3% (11) had an anti-HBs titer between 10 and 100mIU/ml and the rest 86% (92) had an anti-HBs titer of >100 mIU/ml. 3.7% (4) of the vaccinated HCWs did not develop a sufficient anti-HBs response. The frequency non-responders were higher in females in comparison to males ($p = 0.04$) and decline in immune response was noticed with increasing age. ($p = 0.029$).

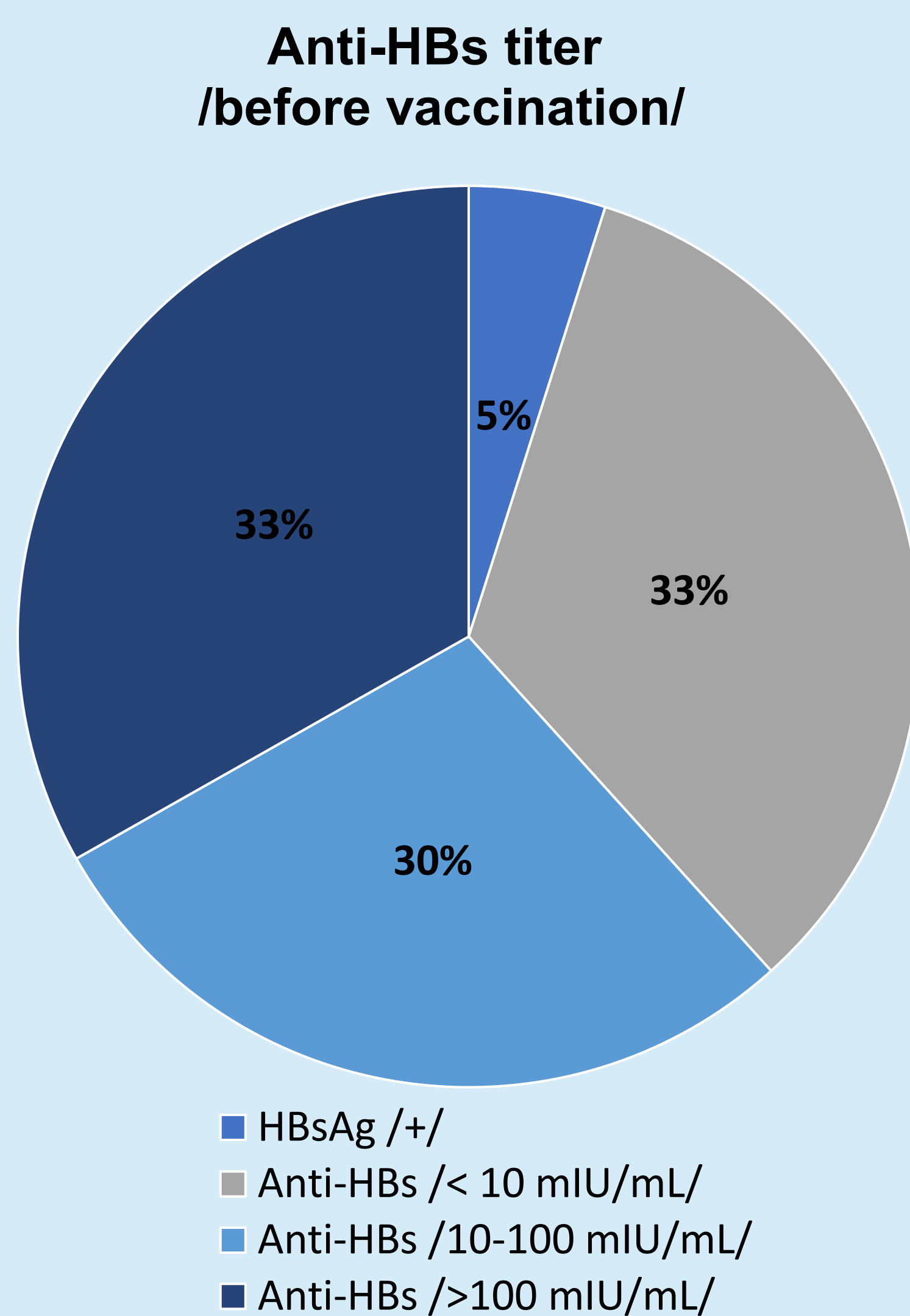


Table-1: Assessment of various parameters in response to hepatitis B virus surface antigen vaccination

Parameters	< 10 mIU/mL, n (%)	10-100 mIU/mL, n (%)	>100 mIU/mL, n (%)	p-value
Anti-HBs titre	4(3.7)	11(10.3)	92(86.0)	
Gender				
Male	0(0)	0(0)	20(100)	0.047 (S)
Female	4(4.6)	11(12.6)	72(82.8)	
Vaccination doses				
1	2(3.5)	7(12.3)	48(84.2)	0.894 (NS)
3	2(4.0)	4(8.0)	44(88.0)	
Age (years)				
<30	1(3.6)	1(3.6)	26(92.9)	0.029 (S)
30-45	2(3.3)	5(8.2)	54(88.5)	
>45	1(5.6)	5(27.8)	12(66.7)	

n: Number of participants, %: Percentage of participants, NS: Not significant, S: Significant, Anti-HBs: Hepatitis B surface antibody

CONCLUSIONS

Protective immune response to hepatitis B vaccine among HCWs is 96.3% that could ensure safety at work by reducing HBV exposure.

ACKNOWLEDGEMENT

This study was funded from the annual allocations for the Mongolia-Japan hospital.

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