"MICRO-INFECTION" OF HBV CAN OCCUR IN MSM WITH VACCINATION OR TENOFOVIR-BASED PrEP

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BACKGROUND

HBV vaccination and tenofovir-based pre-exposure prophylaxis (PrEP) prevent acute HBV hepatitis. However, there are little data on prophylactic effect of these HBV prophylaxes against asymptomatic HBV infection. We investigated acute HBV infection and its serological characteristics according to the HBV prophylaxes among an HIV-negative MSM cohort, sexual health clinic (SHC) in Tokyo, Japan.

METHODS

MSM cohort (SHC)

MSM over 16 years old were included in the SHC cohort. The participants were examined for HIV infection, syphilis (quantitative RPR/TPHA), pharyngeal and rectal *Chlamydia trachomatis* and *Neisseria gonorrhoeae infections,* and HBs antigen/antibody and HBc antibody, HCV antibody and HAV IgG antibody every 3 months.

Inclusion criteria and follow-up period

. Those who were diagnosed with acute HBV infection between January 2018 and March 2022 in SHC were subjects for the current study.

Definition

The definition of acute HBV infection was as followed; 1) for those with positive HBsAg at the enrollment of SHC, clearance of HBsAg within 6 months from the first HBsAg positivity, and 2) for those with HBsAg and HBc Ab negativity (< 1.0 S/CO CLIA method) at the enrollment of SHC, HBsAg or HBcAb seroconversion during the observational period.

Statistics

The cases of acute HBV infection were categorized into A) positive HBsAg, B) negative HBsAg and continuous HBcAb positivity, and C) negative HBsAg and transient HBcAb positivity. B) and C) were evaluated according to HBV prophylaxes including prior HBV vaccination and tenofovir-based PrEP by t-test or chi-square test, accordingly. HBV DNA was measured in subjects in C) if available serum samples were stocked.

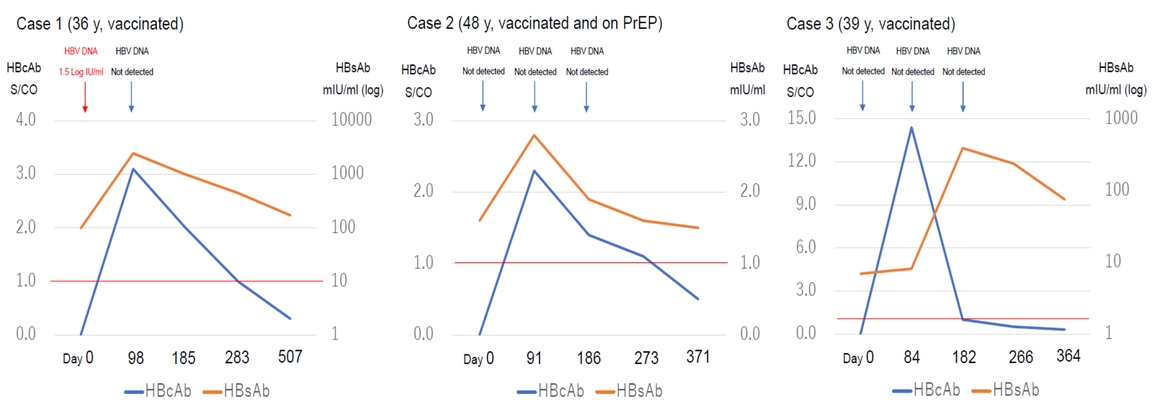
Table 2. Detail of acute HBV infection according to serology and prophylaxes

	All acute HBV infection (n=48)	By Serology				By Symptom
		HBsAg+ (n=24)	HBsAg- (24)			Symptomatic hepatitis (n=19)
			Continuous HBcAb+ (n=13)	Transient HBcAb+ (n=11)	p value (continuous vs transient)	
Age, year (SD)	31 (8.1)	29 (5.7)	29.5 (6.9)	37.2 (11.1)	0.049	28.6 (5.6)
Prophylaxes+	12 (25%)	0	3 (23.1%)	9 (81.8%)	0.006	0
Vaccination	11 (22.9%)	0	3 (23.1%)	8 (72.7%)	0.0038	0
PrEP	6 (12.5%)	0	1 (7.7%)	5 (45.5%)	0.061	0
Both	5 (10.4%)	0	1 (7.7%)	4 (36.4%)	0.142	0

RESULTS

- A total of 1972 MSM were included in SHC as of March 2022. Of these, 48 (mean age 31 years) were diagnosed with acute HBV infection (Table 1).
- MSM with transient HBcAb positivity were significantly more likely to have HBV prophylaxes, while MSM with symptomatic hepatitis and HBsAg positivity were not observed among those who had HBV prophylaxes (Table 2).
- MSM with transient HBcAb positivity was older than MSM with continuous HBcAb positivity, which may be reflected by the fact that MSM with the HBV prophylaxes were significantly older (39.3 vs 28.3 years, p<0.001).
- Of 11 MSM with transient HBcAb positivity, 3 cases were evaluated for HBV DNA and it was detected in a case (Figure 1).
- The average time to normalization of HBcAb was 174 days (Table 3).

Figure 1. Transition of HBV serology in the 3 cases with HBV DNA tests



CONCLUSIONS

While HBV prophylaxes prevented symptomatic hepatitis, the infection without serological trace occurred. Clinical significance of this “micro-infection” should be investigated in further studies.

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Table 1. Baseline characteristics of MSM at the enrollment of the cohort

	N =48
Age, year	31 (18 - 55)
HBs Ab, mIU/ml	24.6 (0 - 869.1)
HBs Ab >10 mIU/ml	6 (12.5%)
Chlamydia Trachomatis	17 (35.4%)
Neisseria gonorrhoea	9 (15%)
Active syphilis	5 (10.4%)
History of syphilis	12 (25%)
HAV Ab (IgG) +	5 (10.4%)
HCV Ab+	0

Table 3. Details of 11 cases with transient HBcAb+

Case	age	HBcAb peak	minimum HBcAb after seroconversion	Days to normalization of HBcAb	Prophylaxis*
1	36	3.1	0.1	409	V
2	48	2.3	0.2	280	V + P
3	39	14.4	0.3	182	V
4	52	1.6	0.1	91	P
5	25	1.3	0.2	179	None
6	28	1.8	0.2	210	V + P
7	29	2.2	0	256	None
8	22	12.1	0	98	V
9	56	1.5	0.9	28	V
10	35	1.1	0.1	88	V + P
11	38	7.2	0.4	91	V + P

* V; Vaccinated, P; PrEP