



A retrospective serological survey of hepatitis B virus infection in Northeast China

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Background: Hepatitis B virus (HBV) infection is a major public health burden in China although it has steadily declined over the last two decades. A valid updated prevalence of HBV infection in China relies on a large sample size. Hence this study aimed to estimate HBV seroprevalence using a large inpatient population in Northeast China.

Methods: We consecutively enrolled 218,627 inpatients aged 1 – 70 years admitted to the First Hospital of Jilin University from January 2010 through December 2014. HBV serological markers were detected by chemiluminescence immunoassay (CLIA).

Results: Among the 218,627 collected samples, 16,254 (7.43%) were positive for HBsAg and 41.64% of patients were negative for all the HBV markers. The highest HBsAg prevalence was 10.05% in the 41 – 50 year age group and the lowest were 0.47% in the 1 – 10 and 2.35% in the 11 – 20 year age groups, respectively.

Table 2 Positivity rate for different combinations of HBV markers among different groups

Combinations	n	HBsAg+ HBeAg+ HBcAb+	HBsAg+ HBeAb+ HBcAb+	HBsAb+ HBcAb+	HBsAb+ HBeAb+ HBcAb+	HBsAb+ HBcAb+	HBsAb+ HBeAb+ HBcAb+	All negative	Other combinations
Gender									
Male	113,789	2.64	5.50	31.53	6.18	2.15	2.55	8.49	40.13
Female	104,838	1.45	3.95	31.74	5.05	1.83	2.03	10.25	43.27
Age group (years)									
1–10	19,489	0.26	0.05	62.21	1.56	0.02	0.19	2.08	33.50
11–20	9846	1.41	0.71	57.33	1.19	0.05	0.35	2.14	36.59
21–30	20,685	3.14	3.18	41.53	3.66	0.58	0.63	7.98	38.80
31–40	27,531	2.99	5.48	31.56	5.19	1.29	1.38	10.62	40.74
41–50	48,475	2.81	6.39	24.63	5.76	2.04	2.14	10.67	44.69
51–60	54,947	2.03	6.07	23.79	6.82	2.87	3.15	10.95	43.56
61–70	37,654	1.02	4.57	24.14	8.45	3.49	4.48	10.69	42.66
Total	218,627	2.07	4.76	31.63	5.64	2.00	2.30	9.33	41.64

HBsAg positivity was higher in males compared to females (8.94% vs. 5.80%). An HBsAg positivity of nearly 14% was found in middle aged males, and positivity was 6.2% in females of childbearing age. One-third of this population only had a single HBsAb marker, which was also detected in 60% of patients aged under 20 years.

Table 3 Gender differences in the HBsAg-positive rate among all age groups

Age group (years)	Male HBsAg, n	Male HBsAg, %	Female HBsAg, n	Female HBsAg, %	χ^2	P-value
1–10	67	0.51	25	0.39	1.437	0.231
11–20	137	2.37	94	2.31	0.038	0.846
21–30	765	8.04	629	5.63	47.278	< 0.01
31–40	1589	12.47	940	6.36	306.344	< 0.01
41–50	3178	13.36	1694	6.86	566.363	< 0.01
51–60	3068	10.6	1793	6.90	232.288	< 0.01
61–70	1369	6.86	906	5.12	49.927	< 0.01

Significant difference between genders in patients aged over 20 years

Conclusion: Though universal hepatitis B vaccination of infants has significantly reduced HBsAg prevalence in children, the number of most adults who have been infected with HBV remains steady. Extra care and resources should be provided to HBV-infected middle-aged males to stop the progression of chronic hepatitis B, and HBsAg positive females of childbearing age to block vertical HBV transmission.