

HIGH PREVALENCE OF HEPATITIS B VIRUS AMONG THE ADULTS LIVING IN THREE REGIONS OF VIETNAM

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Introduction: Hepatitis B virus (HBV) infection occurs worldwide and results in significant social and economic losses. In Vietnam the vaccination against HBV is not included in the national vaccination program. The goal of this study was to analyze the prevalence of HBV in general population in three geographic regions of Vietnam and to identify the circulating HBV genotypes.

Material and methods: A total of 781 adults of 18-79 years old were enrolled in this study. They were living in three different regions: Binh Duong (Binh My community - 125 adults, mean age 43,04 ±12,09; and Chanh My community - 147 adults, mean age 43,51 ±13,39), Khanh Hoa (256 adults; mean age 41,87 ±11,73), and Hai Phong (253 adults, mean age 47,27 ±11,83). The serum samples were analyzed for the presence of HBsAg and total anti-HBc with Monolisa[®] HBsAg detection kit (Bio-Rad, USA) and Anti-HBc detection Kit (Diasorin, Italy), respectively. HBV DNA were extracted from HBsAg positive serum samples. HBV genotypes were determined by sequencing of S gene and phylogenetic analysis. The difference in prevalence of HBsAg and anti-HBc between two groups was considered significant, if the exact 95% binomial confidence intervals (95% CI) for the proportions were non-overlapping.

Results:

1) The prevalence of HBsAg in Binh Duong (BD), Khanh Hoa (KH) and Hai Phong (HP) was 9,9% (95% CI, 6,6-14,1%), 14,1% (95% CI, 10,1-18,9%), and 12,3% (95% CI, 8,5-16,9%), respectively.

Table 1. Prevalence of HBsAg and anti-HBc in general population in different regions of Vietnam

Regions	HBsAg positive results		anti - HBc positive results	
	n/N*	% (95% CI)	n/N	% (95% CI)
BD	27/272	9,9 (6,6-14,1)	150/272	55,1 (49,0-61,2)
KH	36/256	14,1 (10,1-18,9)	173/256	67,6 (61,5-73,3)
HP	31/253	12,3 (8,5-16,9)	154/253	60,9 (54,6-66,9)
Total	94/781	12,0 (9,8-14,5)	477/781	61,1 (57,6-64,5)

*n - number of positive samples, N - total number of samples

Table 2. Prevalence of HBsAg and anti-HBc in general population within Binh Duong region

Regions	HBsAg positive results		anti - HBc positive results		
	n/N	% (95% CI)	n/N	% (95% CI)	
BD	BM	20/125	16,0 (10,0-23,6)	76/125	60,8 (51,7-69,4)
	CM	7/147	4,8 (1,9-9,6)	74/147	50,3 (41,9-58,7)
	Total	27/272	9,9 (6,6-14,1)	150/272	55,1 (49,0-61,2)

The prevalence of anti-HBc in BD, KH and PH was 55,1% (95% CI, 49,0-61,2%), 67,6% (95% CI, 61,5%-73,3%), and 60,9% (95% CI, 54,6%-66,9%), respectively (Table 1). Within BD region the prevalence of HBsAg in Binh My (BM) and Chanh My (CM) communities was 16,0% (95% CI, 10,0%-23,6%) and 4,8% (95% CI, 1,9%-9,6%). The prevalence of anti-HBc in BM and CM was 60,8% (95% CI, 51,7-69,4%) and 50,3% (95% CI, 41,9-58,7%) (Table 2).

2) The highest presence of HBsAg was found in 30-39 and 40-49 age groups in BM, in 18-29 and 30-39 - in CM, in 30-39 - in KH, and in 30-39 - in HP (Table 3).

Table 3. Age-adjusted prevalence of HBsAg in general population in different regions of Vietnam

Age groups	BM		CM		KH		HP	
	n/N	% (95% CI)	n/N	% (95% CI)	n/N	% (95% CI)	n/N	% (95% CI)
18-29	1/20	5 (1-24)	3/32	9 (3-24)	6/47	13 (6-25)	0/20	0 (0-16)
30-39	8/32	25 (13-42)	2/24	8 (2-26)	10/52	19 (11-32)	8/38	21 (11-36)
40-49	8/32	25 (13-42)	0/28	0 (0-12)	8/75	11 (6-20)	6/62	10 (5-20)
≥50	3/41	7 (3-19)	2/63	3 (1-11)	12/82	15 (9-24)	17/133	13 (8-20)

Table 4. Age-adjusted prevalence of anti-HBc in general population in different regions of Vietnam

Age groups	BM		CM		KH		BM	
	n/N	% (95% CI)	n/N	% (95% CI)	n/N	% (95% CI)	n/N	% (95% CI)
18-29	6/20	30 (15-52)	8/32	25 (13-42)	20/47	42 (30-57)	5/20	25 (11-47)
30-39	18/32	56 (39-72)	11/24	46 (28-65)	37/52	71 (58-82)	22/38	58 (42-72)
40-49	26/32	81 (65-91)	15/28	54 (36-70)	52/75	69 (58-79)	34/62	55 (42-67)
≥50	26/41	63 (48-76)	40/63	63 (51-74)	64/82	78 (68-86)	93/133	70 (62-77)

In contrast, the highest presence of anti-HBc was found in 40-49 age group in BM, and in ≥50 age group - in CM, KH, and HP. The lowest presence of anti-HBc in all BM, CM, KH, HP was noted in 18-29 age group (Table 4).

3) A total of 42 HBV isolates were genotyped. HBV genotypes B2, B3, B4, and C2 were identified. HBV genotype B4 was predominant in BM community (13/15, 86,7%), KH (8/12, 66,7%) and HP (8/10, 80,0%) regions. In CM community, 3 (60,0%) out of 5 sequenced isolates belonged to genotype C2. The phylogenetic analysis revealed that Vietnamese HBV isolates formed a distinct clusters within the genotype B4 (Fig. 1).

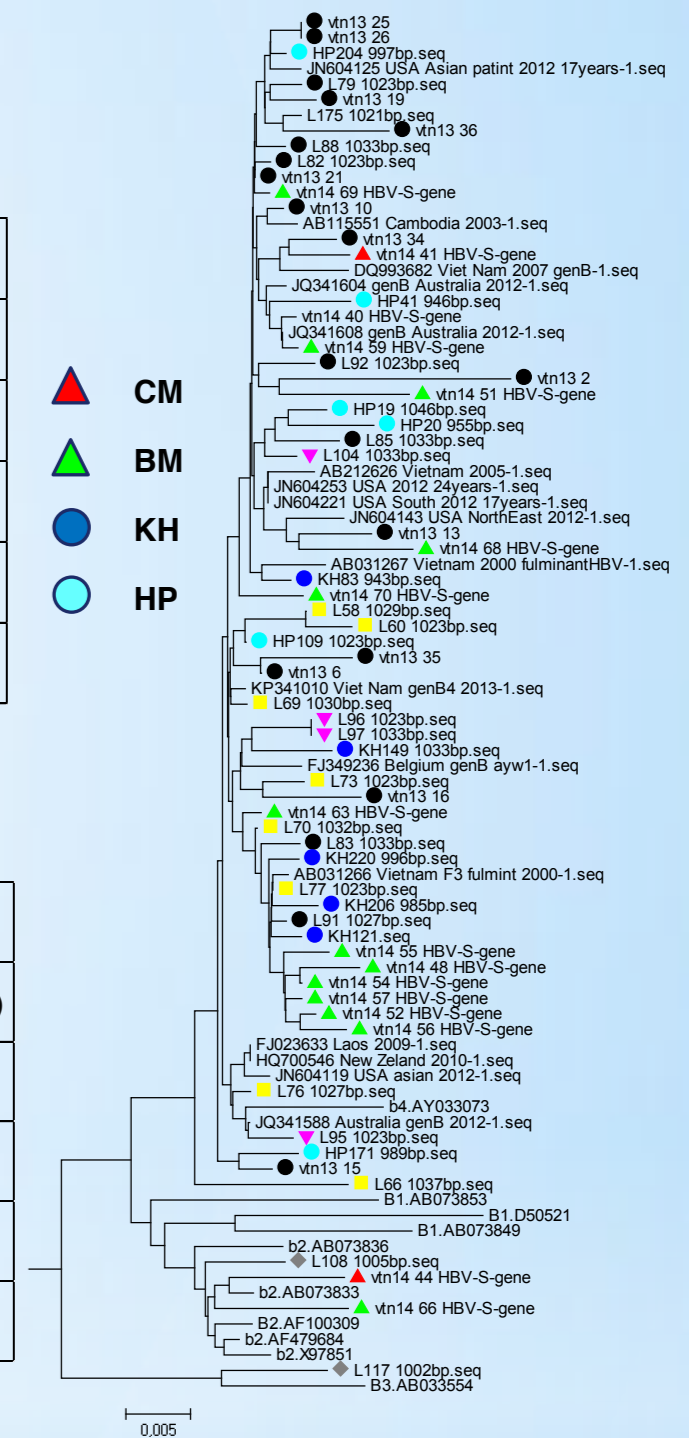
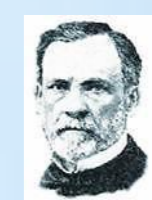


Fig. 1. Part of a dendrogram, representing branch formed by genotype B isolates obtained by Maximum Likelihood method using Mega v.6.0

Conclusions: The high rate of HBV was found among different age groups in all three regions of Vietnam. This finding indicates the need of national vaccination program to prevent the spreading of HBV infection in Vietnam.



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