

Ranking of Administrative Districts of Almaty City by Incidence of Hepatitis B and C

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Abstract

The incidence of acute and chronic hepatitis B and C in the districts of Almaty city over the past 10 years is presented in this article. (**International Journal of Biomedicine. 2017;7(3):240-242.**)

Key words: acute hepatitis B • acute hepatitis C • chronic hepatitis B • chronic hepatitis C • vaccination

Abbreviations

AHB, acute hepatitis B; **AHC**, acute hepatitis C; **CVH**, chronic viral hepatitis; **CHB**, chronic hepatitis B; **CHC**, chronic hepatitis C; **HBV**, hepatitis B virus; **HCV**, hepatitis C virus.; **MYI**, multi-year indicator.

Introduction

Hepatitis B and C viruses are widely distributed among the population around the world. The World Health Organization (WHO) estimates more than 2 billion people have been infected with HBV, 360 million people are chronically infected, and 600 000 people die annually from complications of HBV-related liver disease.^(1,2) Globally, an estimated 71 million people have chronic hepatitis C infection. HCV is approximately 10 times more infectious than HIV through percutaneous blood exposures and has been shown to survive for weeks in syringes.⁽³⁻⁵⁾ A significant number of those who are chronically infected will develop cirrhosis or liver cancer. Approximately 399 000 people die each year from hepatitis C, mostly from cirrhosis and hepatocellular carcinoma.⁽⁶⁾ The number of deaths due to hepatitis C is at an all-time high in the US and exceeds those attributable to 60 other infectious diseases including HIV and tuberculosis, according to the Centers for Disease Control and Prevention.⁽⁷⁾ We analyzed

the incidence of acute and chronic hepatitis B and C in the districts of Almaty city over the past 10 years.

Materials and Methods

For the retrospective epidemiological analysis, we used the data of the official registration of the Department of Sanitary and Epidemiological Surveillance of Almaty for HBV and HCV in the intensive indicators (hepatitis incidence per 100,000 population) from 2003 to 2014 and the percent (%) indicators by stratifications (age and socio-occupational groups) used with dichotomous variables.

The incidence of individual nosological forms of hepatitis in their total sum was expressed in the extensive (relative) indices. The behavior of the epidemic process was assessed by the annual dynamics of the cumulative incidence of hepatitis B and C.⁽⁸⁻¹⁰⁾

Results and Discussion

Table 1 shows the average incidence rate for AHB in Almaty's adult population at 4-year intervals for 2003-2014: the AHB incidence by city areas steadily decreased

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by 3 or more times. These data conclusively demonstrate the epidemiological effectiveness of HBV vaccination.

According to the indicators of the average multi-year incidence of AHB, the studied districts ranged in the following order (by rank): the Bostandyksky (5.4⁰/₀₀₀₀), Auezovsky (4.8⁰/₀₀₀₀), Zhetysusky (4.3⁰/₀₀₀₀), Almalinsky (4.5⁰/₀₀₀₀), Turksibsky (4.1⁰/₀₀₀₀), Medeusky (2.8⁰/₀₀₀₀), and Alatausky (2.1⁰/₀₀₀₀) districts.

Table 1.

The average incidence rate for AHB by the districts of Almaty for 2003-2014

Districts	MYI at 4-year intervals (⁰ / ₀₀₀₀)			Rate of decrease	MYI (⁰ / ₀₀₀₀)
	2003-2006	2007-2010	2011-2014		
Almalinsky	9.3	3.1	1.1	8.4	4.5
Turksibsky	6.6	3.6	2.2	3.0	4.1
Zhetysusky	8.9	2.9	4.15	7.7	4.3
Bostandyksky	9.3	3.5	3.6	2.6	5.4
Medeusky	4.4	3.1	0.92	4.7	2.8
Auezovsky	6.2	6.5	1.9	3.2	4.8
Alatausky	-	4.5	1.6	2.8	2.1

The results of a similar analysis for AHC incidence are shown in Table 2. Thus, during 2003-2014, AHC indicators for districts ranged from 0.25⁰/₀₀₀₀ to 2.7⁰/₀₀₀₀. According to the average multi-year incidence, the Auezovsky district (1.3⁰/₀₀₀₀) took the first place. During subsequent years, these indicators were equal to zero in some districts or were very low due to registration of single cases of AHC. Apparently, comparatively more pronounced indicators in 2003-2006 are associated with deficiencies of the specific qualities (sensitivity, specificity, etc.) of the first batches of diagnostic test systems for ELISA.

Table 2.

The average incidence rate for AHC by the districts of Almaty for 2003-2014

Districts	MYI at 4-year intervals (⁰ / ₀₀₀₀)			Trend	MYI (⁰ / ₀₀₀₀)
	2003-2006	2007-2010	2011-2014		
Almalinsky	1.8	0.0	1.3	1.38↓	1.03
Turksibsky	0.25	0.06	0.0	-	0.08
Zhetysusky	0.35	0.17	0.0	-	0.17
Bostandyksky	0.8	0.4	0.0	-	0.4
Medeusky	0.45	0.85	0.2	2.25↓	0.5
Auezovsky	2.7	0.9	0.3	9.0↓	1.3
Alatausky	-	0.5	1.6	0.3↑	0.7

However, it should be noted that unlike with AHB—in which the IgM antibody to the hepatitis B core antigen is diagnostic of acute infection and precedes the appearance of IgG—with HCV infection the IgM antibody responses are variably detected in both acute and chronic phases.⁽¹¹⁾ Anti-HCV IgM cannot therefore serve as a diagnostic marker of acute HCV infection.⁽¹²⁾

Thus, the assessment of dynamics of incidence of AHB and AHC showed that the incidence rate for AHB dropped sharply, and isolated cases of AHC were in fact cases of CHC. Based on these considerations, our studies in the regions were focused mainly on the problems of chronic hepatitis C, as the most relevant infection for public health.

The analysis of the incidence of CHB and CHC by the districts of Almaty for 2003-2014 is presented in Tables 3 and 4. During the analyzed period, in the study areas, with the exception of the Medeusky and Auezovsky districts, there was a decrease in the incidence of CHB in the range from 1.2 to 3.6 times. In the Medeusky and Auezovsky districts, we observed that the incidence rate of CHB increased by 1.2 and 1.5 times, respectively.

Table 3.

The average incidence rate for CHB by the districts of Almaty for 2003-2014

Districts	MYI at 4-year intervals (⁰ / ₀₀₀₀)			Trend	MYI (⁰ / ₀₀₀₀)
	2003-2006	2007-2010	2011-2014		
Almalinsky	6.4	4.2	3.9	1.6↓	4.8
Turksibsky	2.2	2.8	0.6	3.6↓	1.9
Zhetysusky	0.15	2.1	-	-	1.4
Bostandyksky	6.2	6.1	5.7	1.2↓	6.0
Medeusky	6.2	6.4	7.2	1.2↑	6.6
Auezovsky	5.8	8.7	12.5	2.0↑	9.0
Alatausky	-	3.7	1.9	1.9↓	1.8

Table 4.

The average incidence rate for CHC by the districts of Almaty for 2003-2014

Districts	Multi-year indicators at 4-year intervals (⁰ / ₀₀₀₀)			Trend	MYI (⁰ / ₀₀₀₀)
	2003-2006	2007-2010	2011-2014		
Almalinsky	3.9	3.1	4.1	1.05↑	3.7
Turksibsky	2.5	1.4	2.9	1.3↑	2.3
Zhetysusky	2.1	0.2	-	-	1.4
Bostandyksky	8.9	9.5	9.9	1.1↑	9.4
Medeusky	3.5	1.3	11.5	3.3↑	5.4
Auezovsky	7.9	13.1	21.3	2.6↑	11.6
Alatausky	-	1.3	1.9	1.4↑	1.05

Thus, CHC was registered in all districts of the city. Moreover, during the observed period, there was a tendency for the CHC incidence to grow from 1.1 to 3.3 times. The most noticeable growth was observed in the Medeusky (3.3 times) and Auezovsky (2.6 times) districts.

The analyses of the multi-year incidences of CHB and CHC, with rank positions for districts, are presented in Tables 5 and 6. In the ranking of districts with a decrease in the multi-year incidence of CHB and CHC (per 100 thousand population), the first three ranks were occupied by the same

districts in which the incidence rate for CHB and CHB was the highest. These results may indicate the identity of the mode of transmission for HBV and HCV in these regions.

Table 5.

The 2003-2014 multi-year incidences of CHC with rank positions for districts

Districts	MYI ($^{\circ}/_{0000}$)	Rank number
Auezovskiy	11.6	1
Bostandykskiy	9.4	2
Medeuskiy	5.4	3
Almalinskiy	3.7	4
Turksibskiy	2.3	5
Zhetysuskiy	1.4	6
Alatauskiy	1.05	7

Table 6.

The 2003-2014 multi-year incidences of CHB with rank positions for districts

Districts	MYI ($^{\circ}/_{0000}$)	Rank number
Auezovskiy	9.6	1
Medeuskiy	6.6	2
Bostandykskiy	6.0	3
Almalinskiy	4.8	4
Turksibskiy	1.9	5
Alatauskiy	1.8	6
Zhetysuskiy	1.4	7

Conclusion

Thus, as a whole, we observed a tendency toward a gradual decrease in the incidence of CHB in the districts of Almaty city. Assessment of the hepatitis C incidence by the cumulative indices reflects the disturbing epidemiological situation for this disease that requires the effective and quality monitoring of hepatitis C.

Competing interests

The authors declare that they have no competing interests.

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