Community-wide outbreak of hepatitis A in Latvia in 2008 – an update

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An outbreak of hepatitis A has been ongoing in Latvia with 2,817 confirmed cases reported between 20 November 2007 and 31 December 2008. Initially the spread of infection was due to transmission among drug users and other high-risk groups, as well as several outbreaks in Riga (affecting a school and a restaurant), but in the second half of the year led to a community-wide increase in the number of cases. Molecular analysis of 100 strains showed that 95 belonged to genotype IA, of which 89 were identical and six were single nucleotide variants of the same sequence.

Introduction

The Latvian Public Health Agency (PHA) updates through this article the information on epidemiological situation of hepatitis A in 2008 in Latvia. An increase in number of cases of hepatitis A has been observed since November 2007. A total of 2,817 confirmed cases of hepatitis A were notified between 20 November 2007 and 31 December 2008, and 419 suspected cases were still under investigation on 31 December 2008. The highest number of cases (678) was notified in October 2008. The distribution of confirmed and suspected cases of hepatitis A by month of onset is shown in Figure 1.

Methods

Hepatitis A is a disease under mandatory notification in Latvia. Clinicians should notify suspected and confirmed cases and laboratories are required to report positive hepatitis A virus (HAV) results according to the European Union (EU) case definitions [1].

A probable case is defined as a person with a clinical picture compatible with hepatitis (discrete onset of symptoms and jaundice or elevated serum aminotransferase levels) and with an epidemiological link. A confirmed case is defined as any person meeting the clinical criteria and with serum IgM antibodies against hepatitis A virus (IgM anti-HAV) [1].

Upon receiving notification reports from clinicians or laboratories, all cases of hepatitis A are investigated by epidemiologists from the Public Health Agency (PHA) local branch.

To characterise the HAV circulating in the outbreak, 100 serum samples from the Latvian State Agency "Infectology Center of Latvia" were sent to the Dutch National Institute for Public Health and the Environment (Rijksinstituut voor Volksgezondheid en Milieu, RIVM) for genotyping.

Results of epidemiological investigations

The age of the cases ranged from five months to 86 years, with a median age of 31.7 years. The age and sex distribution of confirmed cases of hepatitis A is shown in Figure 2.

Figure 1

Number of reported cases of hepatitis A, by month of onset, Latvia, November 2007 - December 2008 (n=3,236)

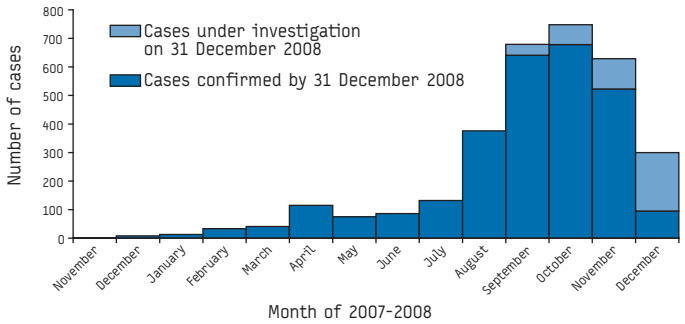


Figure 2

Age and sex distribution of confirmed cases of hepatitis A reported in Latvia from November 2007 to December 2008 (n=2,817)

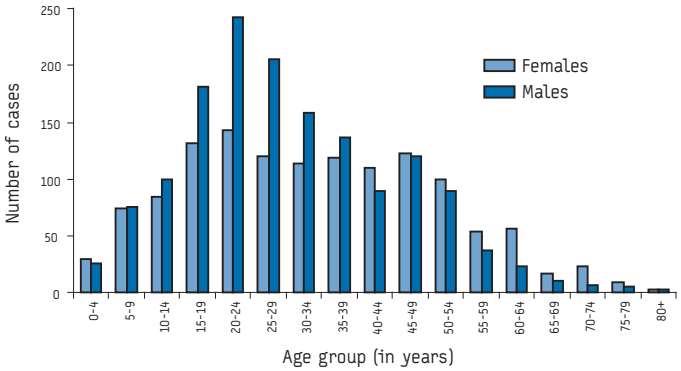


Figure 3

Number of cases of hepatitis A per 100,000 population, by age and sex, Latvia, November 2007 – December 2008

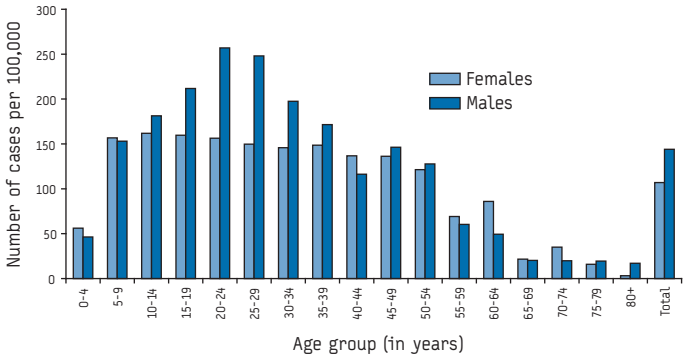


Figure 4

Cases of hepatitis A among drug users and the proportion of drug users among all hepatitis A cases, Latvia, November 2007 - December 2008 (n=191)

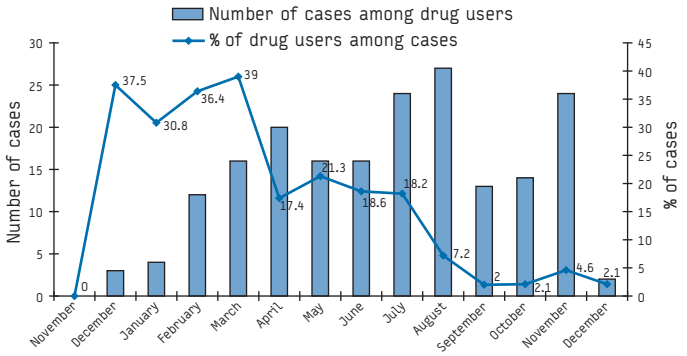


Figure 6

Number of death cases of hepatitis A, by age and sex, Latvia, November 2007 – December 2008 (n=17)

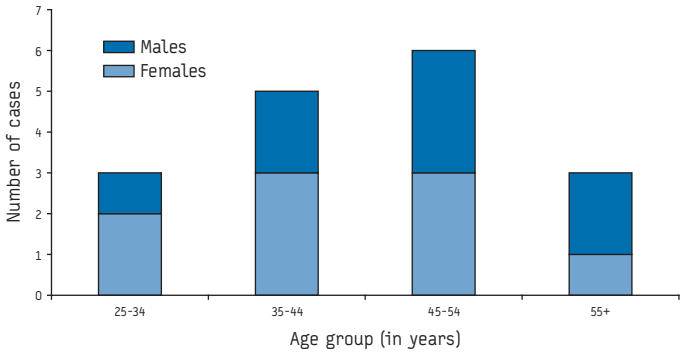


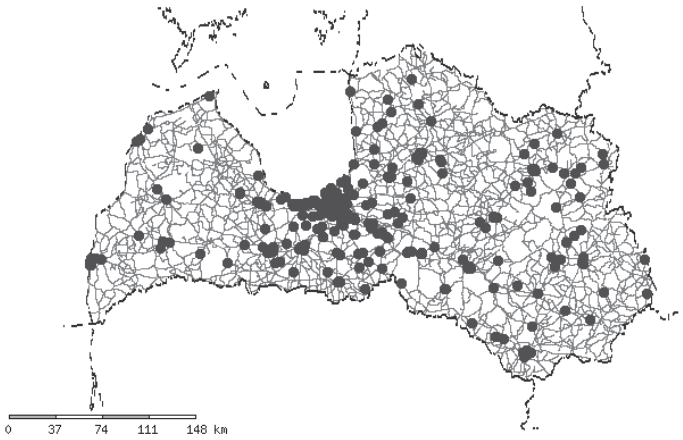
Figure 5

Geographical distribution of reported cases of hepatitis A in Latvia, November 2007 – December 2008

a) Cases reported between 20 November 2007 and 30 April 2008 (n=211)

b) Cases reported between 1 May and 31 August 2008 (n=669)

c) Cases reported between 1 September 2008 and 31 December 2008 (n=1,937)



Significant proportion of cases among adults could be explained by low hepatitis A infection activity in Latvia in recent years and absence of naturally acquired immunity in their childhood. The last biggest outbreak of hepatitis A occurred in 1988-1990 with almost 20,000 cases registered during three years. Since then the number of cases steadily declined and during the last 10 years was very low – an average of 100 cases per year. The lowest number of cases of hepatitis A (n=22) was registered in 2007, the year before the current epidemic.

The proportion of males amongst hepatitis A patients was 72% (range 66 to 73%) in the first six months of the epidemic (November 2007 - April 2008), and 52% in the following period (May - December 2008).

The overall male to female ratio was 1.15 to 1, with the highest rate of 1.55 to 1 in the age group 15 – 34 years.

The overall incidence rate per 100,000 population was 124. The incidence rate amongst males was about 1.35 times higher than amongst females (Figure 3)

The difference in infection risk between the sexes could be partly explained by significant number of cases among male drug users (DUs).

Hepatitis A in drug users

During the observation period, 191 drug users (of whom up to 90% were injecting drug users, IDUs) were notified as hepatitis A patients. The highest numbers were reported in July and August (23 and 27, respectively), but the proportion of drug users amongst all cases was highest in the beginning of the epidemic – up to 39%. The estimated number of problem drug users in Riga is 4,757. As the number of hepatitis A cases among DUs in Riga was 153, the incidence rate in this group could be as high as 3,216 cases per 100,000 in 2008.

Since September, the number of cases among DUs and, in particular, the proportion of DUs among all cases had declined. The reason for this is still unclear although one of the explanations may be that the epidemic in this group started earlier and therefore peaked and declined earlier compared to the outbreak in the general population.

Geographical distribution

The majority of cases of hepatitis A (2,132, 76%) occurred in inhabitants of Riga, 199 in the population of the wider Riga region, 88 cases in Jūrmala and the remaining cases were distributed among other six cities and 23 districts in Latvia which reported between one and 66 cases each.

Clinical outcome

Of the 2,817 confirmed cases, there were 17 deaths (0.6%). 91% of cases of hepatitis A were treated in hospitals.

All death cases were registered in patients with underlying diseases and / or other risk factors (alcohol, drugs). An increase in mortality has been observed during the epidemic, ranging from 0 in the period of time November 2007- March 2008 to 0.77% in October – December 2008 (see Table 1).

There was no difference in mortality rates among cases of hepatitis A by sex.

Genotyping results

One hundred serum samples from Latvian patients were tested for the presence of HAV RNA. All samples were positive and were further processed for genotype analysis by sequencing of 460 nucleotides of the VP1/P2A region. Sequences were compared to each other and to sequences available in public databases. One of the 100 sequences was of genotype IB, with a maximum match of 99% with three sequences originating from North and West Africa. Four of the 100 sequences were of genotype IIIA. The four sequences were identical and have as nearest neighbors 20 sequences in the database that match at 99%. These sequences mostly have their origin in Pakistan.

By far the largest group of sequences from Latvian patients belonged to genotype IA. Of these 89 were identical, and six were single nucleotide variants of this sequence type. These 95 sequences represent the outbreak strain of Latvia 2008. In the databases only two strains were found with sequences matching at 99% or greater. Both were isolated from patients in the Netherlands in 2004 and were travel associated. In one case travel history involved Turkey.

For all three individual sequence types of the three genotypes there were many sequences matching at 98% with various regions of origin, several different transmission modes, and from an extended time period. Therefore, if sequence matching is used for epidemiological linking, sequences should be matching more than 99%

Table 1

Number and proportion of death cases in hepatitis A outbreak in Latvia, November 2007 – December 2008 (n=17)

Months	Number of cases	Number of deaths	% of deaths
November 2007 – March 2008	96	0	0
April – June	276	1	0.36
July – September	1,149	6	0.52
October - December	1,296	10	0.77
Total	2,817	17	0.6

Table 2

Genotype analysis of hepatitis A virus isolated from cases in Latvia, 2008 (n=100)

Genotype	Number of strains isolated from Latvian patients	>99% matching sequence (accession number)	Origin of closest match	Match quality and resolution
IA	95	DQ114859 DQ650789	Turkey	0 differences in 177 nucleotide overlap
IB	1	DQ387553 AY343701 DQ387553	Morocco Morocco Ghana	1 difference in 177 nucleotide overlap
IIIA	4	DQ387610 19 others	Pakistan	1 difference in 177 nucleotide overlap

Source: National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands

The single IB and the four IIIA strains were most likely introduced in Latvia by (returning) travelers, and spread to close contacts if at all. This is a pattern that can be seen in many European countries with a low level of hepatitis A endemicity. The IA strain that caused the outbreak may also have been introduced by a traveler but more importantly it was introduced into a group, in which it could spread more widely than just close contacts, thereby causing an outbreak.

Control measures

With the aim to contain the epidemic, the following measures have been implemented:

All cases of hepatitis A have been investigated by epidemiologists of the relevant local branches of "Public Health Agency". Family doctors have been informed about contacts. Control measures, such as medical observation of contacts and increasing of hygiene and restriction of contacts between children from different groups, have been implemented at places at risk – children establishments, food enterprises, as well as workplaces and households where two and more cases of hepatitis A were registered.

Monitoring of cases of hepatitis A has been enhanced - weekly and, if necessary, daily data are available at the national and local levels. Monitoring data are published on PHA website.

Detailed recommendations for different target groups (staff of food enterprises, children establishments, and general public) have been developed and distributed to different institutions at national and local levels. Recommendations had already been available on the PHA website. Survey data indicated that in October, PHA recommendations were available in 98% of schools.

Lectures for different targets groups (health professionals association, school nurses, family doctors etc.) have been provided.

A special poster-sticker to stress the importance of hand washing has been developed and distributed to schools.

A special survey to identify risk factors for hepatitis A has been performed by PHA in schools. Local governments and administration of the schools were informed about the results of the survey, its conclusions and recommendations.

Intensive collaboration with mass media has been in place. PHA press releases on hepatitis A situation and recommendations have been developed and distributed weekly. Only in November there were 53 publications on hepatitis A in national and local mass media, and 13 interviews on this topic on TV and 17 on the radio.

Although vaccination against hepatitis A has not been provided free of charge, vaccination has been recommended to risk groups and contacts. A significant increase in the number of people vaccinated against hepatitis A has been observed since September 2008 corresponding to the spread of the epidemic.

Conclusion

The ongoing outbreak of hepatitis A in Latvia has not yet been fully understood, but a few working hypotheses may explain the spread of the epidemic. The increase in the number of cases in the beginning of 2008 can be related to the initial spread of infection among DUs and persons with low income level living in substandard hygienic conditions, as well as to several outbreaks (a school in Riga, a restaurant in Riga [2,3]). Increased circulation of the virus in highly susceptible population led, in the second part of the year, to a community-wide increase in the number of cases that demonstrated the typical seasonal activity of hepatitis A usual for endemic years in the past. The modes of transmission involved vary, including person-to-person transmission, contaminated food, and, possibly, swimming in bathing waters in summer.

TABLE 3

Number of vaccinations against hepatitis A in Latvia, 2006-2008

Year	Month	Number of vaccinated with the first dose of vaccine
2006	**January – December**	**1,815**
2007	**January – December**	**2,912**
2008	January	292
	February	383
	March	247
	April	309
	May	415
	June	301
	July	187
	August	357
	September	1,054
	October	1,754
	November	1,631
	December	1,950
	January – December	**8,880**

Source: Monthly statistical data provided by clinicians

References

1. Commission Decision of 19 March 2002 laying down case definitions for reporting communicable diseases to the Community network under Decision No 2119/98/EC of the European Parliament and of the Council (2002/253/EC). Available from: http://eur-lex.europa.eu/pri/en/oj/dat/2002/l_086/l_08620020403en00440062.pdf
2. Perevoscikovs J, Lucenko I, Magone S, Brila A. Increase in hepatitis A cases in Latvia, in 2008, including an ongoing outbreak associated with a restaurant in Riga – preliminary report. Euro Surveill. 2008;13(20):pii=18871. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18871
3. Perevoscikovs J, Lucenko I, Magone S, Brila A, Curikova J. Community-wide outbreak of hepatitis A in Latvia, in 2008. Euro Surveill. 2008;13(40):pii=18995. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18995

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