Hepatitis A Update

British Columbia 2012-2013

This report was prepared by Jason Cabaj, Public Health and Preventive Medicine Resident, and Jane Buxton, Physician Epidemiologist, BC Centre for Disease Control (BCCDC). Wrency Tang, BCCDC Surveillance Analyst, provided assistance with data extraction.
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Report Overview

This report contains a summary of hepatitis A epidemiology in British Columbia for 2012-2013.

During this time period, there were six hepatitis A cases associated with consumption of frozen berries. A pre-existing large outbreak on Vancouver Island that began in July 2010 was declared over in March 2012.

This report summarizes hepatitis A occurrence by case demographics, regional health authority and service delivery area, genotype information, and travel history, and provides a brief summary of recent outbreaks related to frozen fruit consumption.

Data for this summary report were extracted from the integrated Public Health Information System (iPHIS) in July 2014. Travel information missing in iPHIS was obtained from the respective BC Health Authorities. Error bars represent 95% confidence intervals.

Epidemiology

Historical Trends (2004-2013)

There were 35 and 21 confirmed cases of hepatitis A in British Columbia in 2012 and 2013, respectively (Figure 1).

As described in the 2010-11 hepatitis A in British Columbia report, 12 of cases in 2010 and 80 of the cases in 2011 were associated with large VIHA outbreak (1). With the exception of this outbreak-related rise in disease occurrence which peaked in 2011, the annual provincial incidence of reported hepatitis A has continued to decrease.

The 21 cases (0.45 per 100,000 population) in 2013 represent the lowest annual hepatitis A activity yet recorded.
Figure 1. Overall hepatitis A case frequency and incidence (2004-2013)

The average number of reported hepatitis A cases in British Columbia over the last decade is higher in January and February. As the incubation period for hepatitis A is 15-50 days, this may be associated with people travelling to warmer endemic countries during the winter months including Christmas. With the exception of July fewer cases are identified in the summer and early fall months (Figure 2).

Figure 2. Average hepatitis A case frequency by month (2004-2013)
Case Demographics

The average age of cases in 2012-2013 was 30.8 years, with an age range of 0 to 90 years.

Twelve cases occurred in the 40-59 year old age group, but the highest incidence rate was in the 15-19 year old age group (3.36 cases per 100,000) followed by the 10-14 age group (Error! Reference source not found.). There were 27 cases in females and 29 cases in males in 2012-13; 5 cases were identified in children less than 10 years of age.

Figure 3. 2012-13 hepatitis A case frequency and incidence by age group (n=56)
Health Authorities

The incidence rate of hepatitis A at sub-provincial levels is relatively unstable because of the low case counts, particularly for the Interior and Northern Health Authorities, but was below 2 cases per 100,000 population for all Health Authorities in 2012-13.

The greatest number of cases and highest incident rate occurred in the Fraser Health Authority (n=25) incident rate 1.51 per 100,000 population, followed by Vancouver Coastal Health (n=17) incident rate 1.44 per 100,000 population (Figure 4).

Figure 4. 2012-13 hepatitis A case frequency and incidence by Health Authority (n=56)
At the HSDA level, the greatest number of cases in 2012-13 occurred in Fraser South (n=16) and Vancouver (n=10). Four of the 16 HSDAs did not report any hepatitis A cases in 2012-2013 (Figure 5). The three cases in the relatively small population of the Northwest HSDA led to an incidence of 3.96 per 100,000 population but is likely unstable.

Figure 5. 2012-13 hepatitis A case frequency and incidence by HSDA (n=56)

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<tr>
<th>HSDA</th>
<th>Cases</th>
<th>Incidence (per 100,000 population)</th>
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<td>IHA</td>
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<td>Case frequency and incidence by HSDA</td>
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Genotypes
All reactive hepatitis A samples from labs throughout BC are requested to be sent to BC Public Health and Microbiology Reference Laboratory so they can be sent to the National Microbial Laboratory (NML) for genotyping. Hepatitis A genotype information from the NML was available for 34 of 56 cases in 2012-2013 (Figure 6).

Genotype 1b typically is responsible for less than 10% of hepatitis A in Canada (2). In 2012-2013 genotype 1a (n=12) was more common than genotype 1b (n=9); however 6 of these were outbreak cases associated with frozen berries; 13 cases were PCR negative.

Of the 22 cases for which PCR was not carried out, serological testing had occurred at sites other than the PHSA Provincial Laboratory in 15 instances, 3 eligible samples were not sent to NML, and hepatitis A IgM was absent from 4 samples.

Figure 6. 2012-2013 hepatitis A genotypes (n=56)
Risk Factors

Travel
A relevant history of travel to endemic countries was reported for 57% (n=32) of hepatitis A cases in 2012-13 (Figure 7).

Additionally, 5 cases were reported to have had a history of travel to domestic (Alberta (n=2), Ontario (n=1), New Brunswick (n=1)) and non-endemic international destinations (United States (n=1)).

Figure 7. 2012-13 hepatitis A cases with travel to endemic countries (n=32)
Other exposures – Frozen fruit blends
There have been multiple outbreaks of non-travel related hepatitis A associated with consumption of contaminated frozen fruit in recent year. Freezing does not inactivate the hepatitis A virus. Bags of mixed frozen fruit may contain fruit from different locations/countries and different dates of collection. Frozen fruit is often made into ‘smoothies’ and thus the fruit is not cooked.

1) Pomegranate seeds from Egypt were implicated as the cause of a small, (6 confirmed cases with exposure), hepatitis A outbreak in British Columbia in 2012 (3). The common exposure was identified through using supermarket loyalty cards and hepatitis A virus was detected by PCR from the pomegranate seeds.

2) Pomegranate seeds from Turkey in a frozen berry and pomegranate mix were responsible for over 120 cases of hepatitis A in the United States (4).

3) Frozen berries were associated with more than 70 hepatitis A infections in Nordic countries (5).

4) Frozen mixed berries were identified as the vehicle of infection in epidemiologically linked 2013 hepatitis A outbreaks in Italy and Ireland (6).

5) Imported frozen berries were responsible for a large (>240 cases) multi-national hepatitis A outbreak in Europe in 2013-14 (7).

6) A recent report from the European Food Safety Authority indicates since January 2013 more than 1440 hepatitis A cases have been associated with the European outbreak and identified Bulgarian blackberries and Polish redcurrants as the most common ingredient in the food consumed by affected people (8).

When hepatitis A cases do not have a history of travel or other epidemiologic link to a known risk factor, a detailed food history focusing on the consumption of imported frozen fruit should be taken.

Pomegranate Seed Processing

- Pomegranate seeds have been implicated in recent hepatitis A outbreaks
- The pomegranate has a long storage life; it can be maintained at a temperature of 0° to 5° C and at 80 to 85% relative humidity for several months without shrinking or spoiling
- The process of harvesting involves hand picking of the fruits when ripe followed by seed extraction
- Seed extraction by an individual consists of the fruit being scored with a knife
  - The fruit is broken apart manually and the seeds can be separated in a bowl of water (seeds sink and the inedible pulp floats), or
  - The pomegranate cut in half, scoring the exterior rind and striking the pomegranate rind with a utensil
- No information was available regarding commercial processing methods used by companies with pomegranate seeds implicated in the hepatitis A outbreaks but may involve handling by the worker or using water to separate the rind and seeds.
Summary

- Hepatitis A has continued to occur in British Columbia, with very low disease activity in 2012 and 2013.

- The majority of hepatitis A cases continue to be related to travel to or immigration from countries with endemic disease.

- The higher frequency of cases during the winter months, when travel to warm weather destinations increases, suggests there is an ongoing need to reach high-risk travelers with preventive measures.

- The numerous recent outbreaks of hepatitis A related to the consumption of frozen fruit demonstrates the importance of obtaining a targeted food history in absence of travel to endemic countries.

- Risk factor information for hepatitis A cases e.g. travel is incomplete. Public health surveillance of hepatitis A would be more robust if complete exposure information were available in one system.

- Genotyping of hepatitis A is incomplete as not all samples are received by BC Provincial laboratory to be sent to national Microbiology Laboratory.
References


2. Andonov A, Grudeski E, Morbey M. Molecular epidemiology of hepatitis A virus (HAV) in Canada. Proceedings of the Canadian Association for Clinical Microbiology and Infectious Diseases (CACMID) 72nd Conjoint Meeting on Infectious Diseases. 2004 November 7-10; p. 44.


