

Investigation update: A cluster of Genotype A2 'Prisoner Variant' Acute Hepatitis B Infections

Wallace SJ^{1,2}, Ijaz S³, Mandal S³, Young N²,

1. Royal Cornwall Hospital 2. Public Health England, Southwest 3. National Infection Service, Colindale, Public Health England



Between April 2012 and August 2014 a cluster of cases of acute Hepatitis B virus (HBV) infection was investigated by Public Health England (PHE) in Southwest England.

Compared to the national picture, cases were:

- Older
- All male
- The majority reporting no risk-factors for HBV exposure

It was hypothesised that these cases were linked by a common source of transmission or risk behaviour.

Methods

Case definition: men, aged 35-75 years, presenting with acute HBV across a defined geographical area (undisclosed), with no recorded risk factors

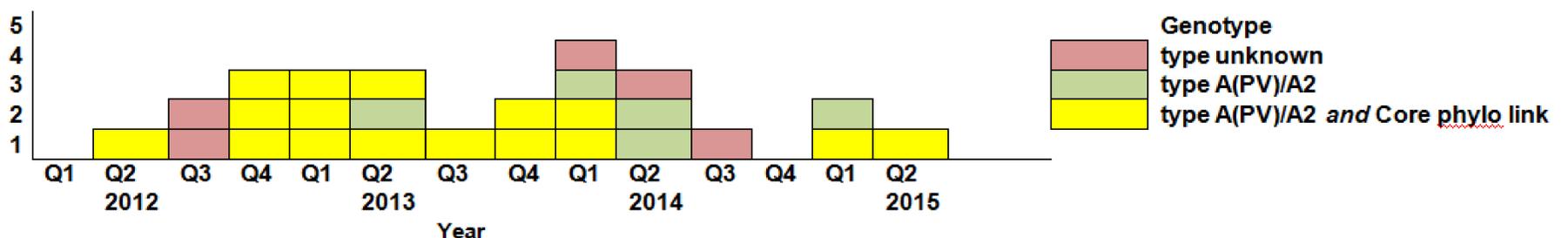
Data from the PHE case management system were used to investigate cases of acute HBV matching the case definition from January 2012 to January 2015.

Acute HBV was defined as HBV core IgM positive status with clinical symptoms or biochemical markers consistent with acute hepatitis.

Risk factors were investigated using a questionnaire. Detailed questions were included regarding sexual risk behaviour.

Serum specimens from cases - where available - and from other acute HBV cases during the time-period, were sent to the PHE reference laboratory services for typing and phylogenetic analysis.

Figure 1 Epidemic curve displaying number of male cases of acute Hep B in Devon per quarter Q1 2012 to Q2 2015; cases of known type (e.g. D) other than A/A2 excluded. "Core phylo link" notifies cases identical on phylogenetic tree.



Results

Between Jan 2012 and Jan 2015 33 cases of HBV were reported to PHE in the region, 19/33 were men fitting the case definition.

A further 7 men aged 35-75 years, who did report risk factors were diagnosed with acute HBV infection: n=26

Six cases did not have stored serum for genotyping.

Eighteen cases of HBV Genotype A2 were identified, 15 met the exact case definition with no risk factors, with the remaining 3 reporting unprotected sex with men.

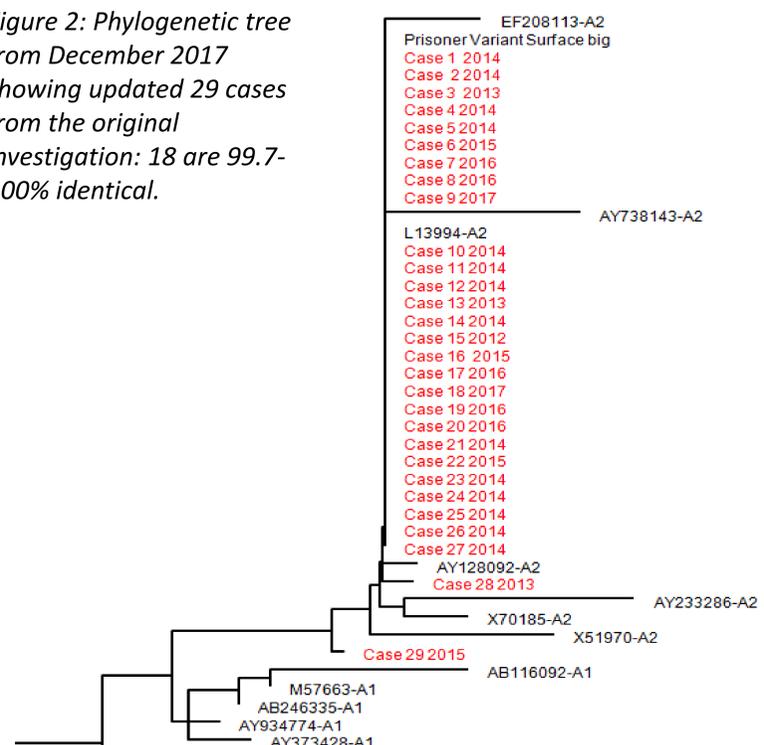
Three Cases of Genotype D were identified all of which reported risk factors.

15/19 cases that fitted the case definition described themselves as heterosexual and married at the time of diagnosis. All spouses tested were HBV un-infected.

Of the 18 A2 genotypes 17 were 99-100% identical and 13 were 99.7-100% identical at the nucleotide level with one case differing by a single base pair at the HBsAg region. All cases were of a single, stable strain known as the 'Prisoner Variant', noted among prisoners and men who have sex with men (MSM) in England.

Local outreach services provided information both directly at public sex environments, and through social media, to advise those at risk regarding safe sex, testing, and vaccination. A further 4 genotype A2 cases were reported in 2015 and the cluster is considered active.

Figure 2: Phylogenetic tree from December 2017 showing updated 29 cases from the original investigation: 18 are 99.7-100% identical.



Conclusions

The genotypic link and phylogenetic clustering of 18 cases of HBV indicates a common source of infection despite the lack of reported risk factors. This outbreak demonstrates the utility of molecular methods in outbreak investigation, particularly where risk behaviours are not reported. The outbreak has also highlighted a vulnerable sub-group of men who do not identify as MSM or disclose high HBV exposure risk and are therefore harder to reach for health education and vaccination.

	Genotype A2	Genotype D	Not tested
Full Case description	15	0	5
Reported Risk Factors	3	3	1