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Acute hepatitis B (England): annual report for 2017

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Introduction

Hepatitis B is a blood borne infection of the liver caused by the hepatitis B virus (HBV). The virus can provoke an acute illness characterised by nausea, malaise, abdominal pain, and jaundice but can also produce a chronic persistent infection that is associated with an increased risk for chronic liver disease and hepatocellular carcinoma. Transmission is by parenteral exposure to infected blood and body fluids contaminated by blood, most often through sexual contact, blood to-blood contact and perinatal transmission from mother to child. HBV infection can be prevented by immunisation and in the UK immunisation is recommended for individuals at high risk of exposure to the virus e.g. people who inject drugs (PWID), healthcare workers and household contacts of people who are acutely and persistently infected with hepatitis B. Immediate post-exposure immunisation is used to prevent infection, especially in babies born to infected mothers or following needle-stick injuries. [1] In August 2017, the UK also introduced hepatitis B containing hexavalent vaccine into the routine infant immunisation programme [2].

Surveillance of acute hepatitis B is essential to target prevention and control activities such as the selective immunisation programme. Public Health England, formerly the Health Protection Agency (HPA) implemented national surveillance standards [3] for hepatitis B in 2007 which provided the framework for more consistent reporting of cases from PHE Centres. Available data on confirmed acute infections reported from laboratories can then be used to augment the epidemiological data collected from the local centres. The first report was published in 2008, and this current report provides an update and presents acute hepatitis B surveillance data for 2017.

Methods

The surveillance definition for acute hepatitis B [4] is:

“HBsAg positive *and* anti-HBc IgM positive *and* abnormal liver function tests with a pattern consistent with acute viral hepatitis.”

As information on liver function is usually not available to PHE, for the purpose of this analysis:

- cases classified as acute viral hepatitis B by the local PHE Centre or the laboratory and/or with a documented positive anti-HBc IgM were classified as acute cases
- cases classified as acute viral hepatitis B by the PHE Centre but without anti-HBc IgM test results, or not classified but with a positive anti-HBc IgM reported were assumed to be probable acute hepatitis B cases
- cases classified as acute by the PHE Centre but with contradictory evidence e.g. positive hepatitis serology results dated before July 2012 were reclassified as chronic infections
- cases classified as chronic persistent infections or those not classified where anti-HBc IgM was negative or equivocal were assumed to be chronic persistent infections.

PHE Centre cases with a date entered from 1 January 2017 to 31 December 2017 were extracted from HP Zone and matched to a laboratory dataset using Microsoft Access and algorithms comparing combinations of the following variables: Surname, First name, date of birth, sex, clinic number and NHS number. The laboratory database contained all confirmed hepatitis B infections reported to PHE by laboratories in England and Wales (SGSS). A final reconciled dataset included cases classified as acute or probable acute and reported from the PHE Centre and/or from laboratories around the country to SGSS. After follow up with the clinician and/or the patient, PHE Centre staff assigned a probable route of exposure and collected information on other possible exposure routes. For the analysis, where the probable route of exposure had not been assigned due to more than one exposure, the most likely route was assigned hierarchically (people who inject drugs, followed by sex between men, then heterosexual exposure, etc.).

Results

The PHE Centres reported 4,762 hepatitis B cases from 1 January to 31 December 2017 to the PHE Immunisation, Hepatitis and Blood Safety Department. The matching and classification exercise resulted in 324 of these being confirmed as acute and 51 re-classified as probable acute cases with the remainder classified as chronic or excluded.

A total of 9,774 confirmed hepatitis B infections were reported from laboratories to SGSS in the same period, 317 (3.2%) of which were classified as acute cases, 36 (0.4%) as probable acute cases. The remainder were classified as chronic or excluded.

After the two databases were linked and reconciled, a total of 445 acute or probable acute cases of hepatitis B were reported for England in 2017. This gives an annual incidence of 0.80 per 100,000 populations lower than the incidence of 0.82 per 100,000 population reported for 2016.

London is still the region with the highest incidence (1.43 per 100,000) and this has decreased from the previous year (1.70 per 100,000). The highest increase in incidence was reported from West Midlands region (from 0.50 to 0.82 per 100,000 in 2016 and 2017 respectively) and South East (from 0.49 to 0.68 per 100,000). The largest decrease was reported from North West (from 1.02 to 0.52 per 100,000 in 2016 and 2017 respectively) and London (from 1.70 to 1.43 per 100,000 in 2016 and 2017 respectively).

In the remaining regions incidence was similar or slightly declined / incline from last year (table 1). There continues to be regional variation in the contribution of the different data sources to the overall total, although the overlap between sources has continued to improve suggesting that completeness of reporting by laboratories and local clinicians has shown a slight improvement.

As in previous years, where known the majority of cases were in men (70.4%) who had an overall incidence of 1.14 per 100,000 – an increase from 1.09 per 100,000 in 2016 compared to a continuing decline from the previous year [4]. The corresponding incidence in women in 2017 was 0.47 per 100,000 a decrease from 0.55 per 100,000 in the previous year. Men aged 25-34 years had the highest incidence of acute hepatitis B in 2017 at 1.97 per 100,000.

Only 68 cases (15.3%) of the total acute or probable acute hepatitis B cases had their ethnicity recorded; a lower proportion than the previous year. Sixty seven percent of the cases were white (a decrease from 79% in 2016), followed by Black or Black British (14.7%) and Asian or Asian British (8.8%).

Of the total 445 acute and probable acute cases of hepatitis B, 124 (27.9%) had associated exposure information recorded (with the most probable route of acquisition assigned by the PHE Centre). A higher proportion (36% 164/453) had exposure information available in 2016. As in previous years where known the commonest reported risk attributed was heterosexual exposure, implicated as the probable route of exposure in 68 (54.8%), compared to 64.6% in this category in 2016 (n=106). Cases attributed to sex between men

were reported in 19 (15.3%); a similar proportion to the 23 (14.0%) reported in 2016. There were no cases with known exposure were attributed to PWID (a decrease from 7.3% in the previous year).

Where known, 9 (7.26%) cases had health care related exposures (including surgery, dental treatment, and other hospital exposure) – similar to the 9 (5.5%) cases assigned to medical risk factors last year. Skin piercing or tattooing was listed as probable exposures for four cases (3.3%, 4/124).

Discussion

In 2017, reporting of acute cases of hepatitis B from PHE Centres has continued to exceed the number reported from laboratories but the proportion of cases reported by both PHE Centres and laboratory systems is high at 63.6% (283/445), compared to 43.7% (198/453), of cases reported in 2016. Prior to 2017, there had been a slight decrease in overlap which may have been due to the introduction of a new database to process the SGSS laboratory reporting system data.

There was nonetheless an overall improved matching over the years that could be explained given the introduction of statutory laboratory reporting in October 2010 and the continued decline in the proportion of cases of unknown status reported from laboratories. Combining data from both sources does minimise under ascertainment and improve the completeness of associated data for analysis. Interpretation of trends should be made with caution, but based on this combined data, the incidence of acute hepatitis B remains low. Given the improved quality and completeness of data provided in 2016/2017, it is likely that there has been a continued gradual decline in incidence since 2008 which has become more apparent in the more recent years.

It is known that anti-HBc IgM, normally a marker of acute infection, may be detected during flares in chronic infections. To minimise misclassification, matching to historical laboratory reports can identify those chronic infections detected previously. However, there is still likely to be some misclassification of chronic cases as acute infections in both datasets. Given the large number of chronic cases diagnosed each year, even a small proportion of cases misclassified as acute can substantially increase the estimated incidence of acute hepatitis B, and confuse the attribution of exposures. Further testing using anti-HBc avidity is now being offered at PHE Colindale, to enable better distinction between acute and chronic infection. Local laboratories can send samples from IgM positive cases to the national virus

reference laboratory where both genotyping and avidity testing will be undertaken free of charge [6].

Risk factor data were available in 27.9% of cases. The interpretation of these data is difficult because in many instances, more than one possible exposure is listed and a probable exposure had not been assigned by the local HPT. Despite this, the data suggest that the number of cases in PWID has remained low in 2017. The overall low incidence in this group is supported by the 2017 Unlinked Anonymous Monitoring Survey of people who Inject Drugs in contact with drug services which showed that anti-HBc prevalence has remained low and self-reported uptake of hepatitis B vaccine has remained high since 2009, particularly in recent initiates, and HBsAg prevalence among anti-HBC positives has remained very low [7]. Improved reporting of risk factors associated with HBV acquisition will enable a more comprehensive interpretation of surveillance trends and appropriate response to clusters.

The incidence of acute hepatitis B continues to remain higher in males than females. This excess of male cases is partly explained by cases in men who have sex with men (MSM); the number of cases with this exposure reported has remained high again this year, following a large increase in 2010. Such cases are more likely to attend GUM clinics, reinforcing the important role of GUM clinics in providing opportunistic hepatitis B immunisation to MSM and individuals with multiple sexual partners. The joint PHE and British Association of Sexual Health and HIV (BASHH) standard form for GUM clinics to report acute hepatitis to their local health protection team continues to improve the reporting of cases diagnosed in this setting [8].

In addition, following recent clusters of acute hepatitis B in men who did not disclose MSM activity initially [9], an enhanced surveillance questionnaire for acute hepatitis B cases was developed in 2016 to support HPTs in obtaining risk factor information on cases with undisclosed risk factors, particularly during outbreaks, to inform and target control measures. More complete risk factor information and full hepatitis B virus serological markers will assist with the interpretation of surveillance data.

Table 1. Acute or probable acute hepatitis B cases by region and source of report, 2017 (incidence 2008-2014 – mid 2013 population, incidence 2015 – mid 2015 population, incidence 2016 – mid-2016 population and incidence 2017 – mid-2017 population ONS [5])

REGION	HPT	Laboratory	BOTH	TOTAL	Incidence of reported acute hepatitis B per 100,000 in 2017	Incidence of reported acute hepatitis B per 100,000 in 2016	Incidence of reported acute hepatitis B per 100,000 in 2015	Incidence of reported acute hepatitis B per 100,000 in 2014	Incidence of reported acute hepatitis B per 100,000 in 2013	Incidence of reported acute hepatitis B per 100,000 in 2012	Incidence of reported acute hepatitis B per 100,000 in 2011	Incidence of reported acute hepatitis B per 100,000 in 2010
EAST MIDLANDS	8	4	27	39	0.82	0.70	1.07	0.41	0.35	0.77	0.76	0.74
EAST OF ENGLAND	10	2	30	42	0.68	0.62	0.76	0.89	0.81	0.89	1.08	0.78
LONDON	20	41	65	126	1.43	1.70	1.53	1.52	1.22	2.02	2.06	1.82
NORTH EAST	1	0	12	13	0.49	0.68	0.34	0.84	0.65	0.46	0.54	0.54
NORTH WEST	8	3	27	38	0.52	1.02	0.64	0.82	0.87	0.61	0.99	0.96
SOUTH EAST	18	9	35	62	0.68	0.49	0.69	0.71	0.67	0.84	0.96	0.84
SOUTH WEST	8	3	27	38	0.69	0.53	0.49	1.08	0.63	1.40	1.16	1.05
WEST MIDLANDS	8	2	38	48	0.82	0.50	0.85	0.78	0.55	0.98	0.90	0.66
YORKS AND HUMBER	11	6	22	39	0.72	0.72	0.65	0.82	0.82	0.83	1.06	0.97
NATIONAL	92	70	283	445	0.80	0.82	0.83	0.91	0.77	1.04	1.13	0.99

Table 2. Age and sex breakdown of acute or probable acute hepatitis B reports, 2017 incidence 2017 – mid-2017 population ONS [5]

Age group	Female		Male		NK		TOTAL	
	N	Incidence of reported acute hepatitis B per 100,000 population	N	Incidence of reported acute hepatitis B per 100,000 population	N	Incidence of reported acute hepatitis B per 100,000 population	N	Incidence of reported acute hepatitis B per 100,000 population
LT15	3	0.06	3	0.06	0	-	6	0.06
15-24	24	0.74	35	1.03	0	-	59	0.89
25-34	43	1.14	75	1.97	1	0.01	119	1.35
35-44	19	0.53	51	1.45	0	-	70	0.99
45-54	23	0.59	68	1.77	1	0.01	92	1.19
55-64	12	0.37	57	1.79	0	-	69	1.07
GE65	7	0.13	23	0.50	0	-	30	0.30
NK	0	-	0	-	0	-	0	0.00
Total	131	0.47	312	1.14	2	0.00	445	0.80

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Health Protection Report is a national public health bulletin for England and Wales, published by Public Health England. It is PHE's principal channel for the dissemination of laboratory data relating to pathogens and infections/communicable diseases of public health significance and of reports on outbreaks, incidents and ongoing investigations.

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