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Acute hepatitis B (England): annual report for 2012

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 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, most often through sexual contact, blood-to-blood contact and perinatal transmission from mother to child. HBV infection can be prevented by vaccination and in the UK immunisation is used for individuals at high risk of exposure to the virus or complications of the disease e.g. injecting drug users, healthcare workers. Immediate post-exposure vaccination is used to prevent infection, especially in babies born to infected mothers or following needle-stick injuries. [1]

Surveillance of acute hepatitis B is essential to target prevention and control activities such as the immunisation programme. Public Health England (formerly The Health Protection Agency (HPA) implemented national surveillance standards [1] 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 report provides an update and presents acute hepatitis B surveillance data for 2012.

Methods

The surveillance definition for acute hepatitis B [2] 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:

- those cases classified as acute hepatitis by the local PHE Centre or the laboratory and/or with a documented positive anti-HBc IgM were classified as acute infections;
- those classified as acute infections by the PHE Centre but without anti-HBc IgM results, or not classified but with a positive anti-HBc IgM were assumed to be probable acute cases;
- those classified as acute by the PHE Centre but with contradictory evidence e.g. positive hepatitis serology results dated before July 2011; were reclassified as chronic infections;
- cases classified as chronic infections or those not classified where anti-HBc IgM was negative or equivocal were assumed to be chronic infections; and
- those cases that remained unclassified and without anti-HBc IgM results were excluded from further analysis.

PHE Centre cases with a date entered from 1 January 2012 to 31 December 2012 were extracted from HPZone and matched to a laboratory dataset using Microsoft Access and algorithms comparing combinations of the following variables: Surname, First name, soundex, 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 (LabBase).

The Labbase data was used to augment laboratory results and determine final status of any matching cases reported from the PHE Centre. A final reconciled dataset included cases classified as acute or probable acute and reported from the PHE Centre and/or from the laboratory to LabBase. 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, the most likely route was assigned hierarchically (injecting drug use, followed by homosexual exposure, then heterosexual exposure, etc).

Results

The PHE Centres reported 6,058 hepatitis B cases from 1 January to 31 December 2012 to the PHE Immunisation, Hepatitis and Blood Safety Department. The matching and classification exercise resulted in 424 of these being confirmed as acute and 76 re-classified as probable acute cases with the remainder classified as chronic or excluded. Twenty six cases reported as acute from the PHE Centres were excluded or reclassified because they had no anti-HBc IgM result, were matched to a case classified as laboratory database or were duplicate episodes. A total of 9,283 confirmed hepatitis B infections were reported from laboratories to LabBase in the same period, 392 (4.2%) of which were classified as acute cases, 46 (0.5%) as probable acute cases, 7,935 (85.5%) were classified as chronic and 910 (9.8%) remained unclassified.

After the two databases were linked and reconciled, a total of 554 acute or probable acute cases of hepatitis B were reported for England in 2012. This gives an annual incidence of 1.04 per 100,000 population, slightly lower than the incidence of 1.13 per 100,000 reported for 2011. London is still the region with the highest incidence (2.02 per 100,000) although this has remained stable from the previous year; the North East now has the lowest incidence (0.46 per 100,000). In seven regions incidence was similar or declined from last year; in three slight increases were observed (table 1). The largest increase (0.24) since 2011 was observed in the South West. There continues to be regional variation in the contribution of the different 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 also improved.

As in previous years, the majority of cases were in men (68%) who had an overall incidence of 1.45 per 100,000 - a decrease from 1.63 per 100,000 in 2011. The corresponding incidence in women in 2012 was 0.64 per 100,000 a slight increase from the previous year. Men aged 35-44 years had the highest incidence of acute hepatitis B at 2.69 per 100,000.[3] The incidence in children remains very low (table 2).

Only 113 (20%) of the total acute or probable acute hepatitis B cases had their ethnicity recorded, a lower proportion than the previous year. Just under half of the cases were white (46%), followed by Black or Black British (19%) and Asian or Asian British (18%).

Of the total 554 acute and probable acute cases of hepatitis B, 332 (60%) had associated exposure information recorded (with the most probable route of acquisition assigned by the PHE Centre in 270 (49%)); an improvement on 2011 when exposure information was available for only 296 (50%). As in previous years the commonest reported risk attributed was heterosexual exposure, implicated as the probable route of exposure in 191 (58%), exactly the same proportion (n=172) as in 2011. Cases attributed to sex between men were reported in 58 (17%) a similar number to the 59 (20%) reported in 2011. Only five (1.5%) of the cases with known exposure were attributed to injecting drug use – lower than the 13 reported last year. Similar to last year, however, injecting drug use was reported for an additional seven cases attributed to other exposures (six of those attributed to sexual exposure and a single case attributed to skin piercing or tattooing).

In all, 33 (10%) cases had health care related exposures including, surgery, dental treatment, blood transfusion, and dialysis (5 of these cases were reported to have been exposed abroad including one of the three with history of transfusion) – an increase on the 23 cases assigned to medical risk factors last year. Skin piercing, tattooing and acupuncture combined were listed as probable exposures for twelve cases (3.6%) and a range of other risks were reported for the remaining 33 cases.

Table 1. Acute or probable acute hepatitis B cases by region and source of report, 2012 (incidence 2008-2011 - mid-2011 population ONS)

Region	Source of report				Incidence of reported acute hepatitis B				
	PHEC only	Laboratory only	Both sources	Total (% reported to both sources)	**2012**	2011	2010	2009	2008
East Midlands	21	2	12	35 (34%)	**0.77**	0.76	0.74	0.85	1.3
East of England	2	2	48	52 (92%)	**0.89**	1.08	0.78	0.85	0.97
London	62	26	78	166 (47%)	**2.02**	2.06	1.82	1.80	1.83
North East	1	–	11	12 (92%)	**0.46**	0.54	0.54	1.28	0.70
North West	5	1	37	43 (86%)	**0.61**	0.99	0.96	1.64	1.79
South East	14	11	48	73 (66%)	**0.84**	0.96	0.84	1.03	1.00
South West	9	5	60	74 (81%)	**1.40**	1.16	1.05	0.78	0.85
W. Midlands	15	1	39	55 (71%)	**0.98**	0.90	0.66	0.74	0.76
Yorkshire & the Humber	3	6	35	44 (80%)	**0.83**	1.06	0.97	1.05	1.18
National	**132**	**54**	**368**	**554 (66%)**	**1.04**	**1.13**	**0.99**	**1.15**	**1.21**

Table 2. Age and sex breakdown of acute or probable acute hepatitis B reports, 2012 (mid-2011 population ONS) [4]

	Number of cases (incidence per 100,000 population) of reported acute hepatitis B						
Age group	Female		Male		Not known	Total	
Under 15 years	7	(0.15)	6	(0.12)	–	13	(0.14)
15-24 years	40	(1.18)	32	(0.91)	–	72	(1.04)
25-34 years	43	(1.20)	82	(2.28)	–	125	(1.74)
35-44 years	38	(1.02)	99	(2.69)	2	139	(1.88)
45-54 years	21	(0.57)	81	(2.23)	–	102	(1.39)
55-64 years	16	(0.51)	46	(1.51)	–	62	(1.01)
65 years or over	8	(0.17)	33	(0.85)	–	41	(0.47)
Not known	–	–	–	–	–	–	–
Total	**173**	(0.64)	**379**	**(1.45)**	**2**	**554**	**(1.04)**

Discussion

In 2012, 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 PHEC and laboratory systems is high at 66% (368/554). This increase in overlap may be due to improved matching because of better quality identifiers or it may reflect more complete reporting from both sources. The latter explanation is plausible 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 symptomatic hepatitis B remains stable and low. Given the improved quality and completeness

of data provided in 2012, it is likely that there has been a continued gradual decline in incidence since 2008.

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 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 reference laboratory where both genotyping and avidity testing will be undertaken [5].

Risk factor data was available in 60% of cases. The interpretation of this 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 unit. Despite this, the data suggests that the number of cases in injecting drug users (IDUs) has remained low in 2012, lower than the number reported in 2011. The continued decline in incidence in this group is supported by the 2011 unlinked anonymous survey among IDUs which showed that anti-HBc prevalence has remained low since 2009, particularly in recent initiates [6].

The incidence 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, although the number of cases with this exposure reported has remained high again this year, following a larger increase in 2010. Such cases are more likely to be diagnosed in GUM clinics, and in 2010 the HPA worked with the British Association of Sexual Health and HIV (BASHH) to introduce a standard form for GUM clinics to report acute hepatitis to their local health protection unit [7]. This may have helped to increase the reporting of cases diagnosed in this group.

This year, a higher proportion of cases were attributed to medical exposure. It is likely that many of these attributions are incorrect, as further investigation may have been undertaken – for example by NHS Blood and Transplant and excluded transmission by this route. In future years, it is recommended that cases with these exposures assigned are checked prior to reporting.

References

1. Immunisation against infectious disease, London, Department of Health, 2006.
2. Standards for local surveillance and follow up of hepatitis B and C, London. Health Protection Agency, 2006.
3. http://www.hpa.org.uk/hpr/archives/2012/hpr3412_acthpb11.pdf
4. Mid-2011 population estimates for England, Office of National Statistics, 2012.
5. Genotyping analysis of acute hepatitis B virus infection sample referral form. HPA website: http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1257260343210.
6. Unlinked Anonymous Monitoring Survey of Injecting Drug Users. HPA website: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317135226434.
7. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/HepatitisB/Forms/.