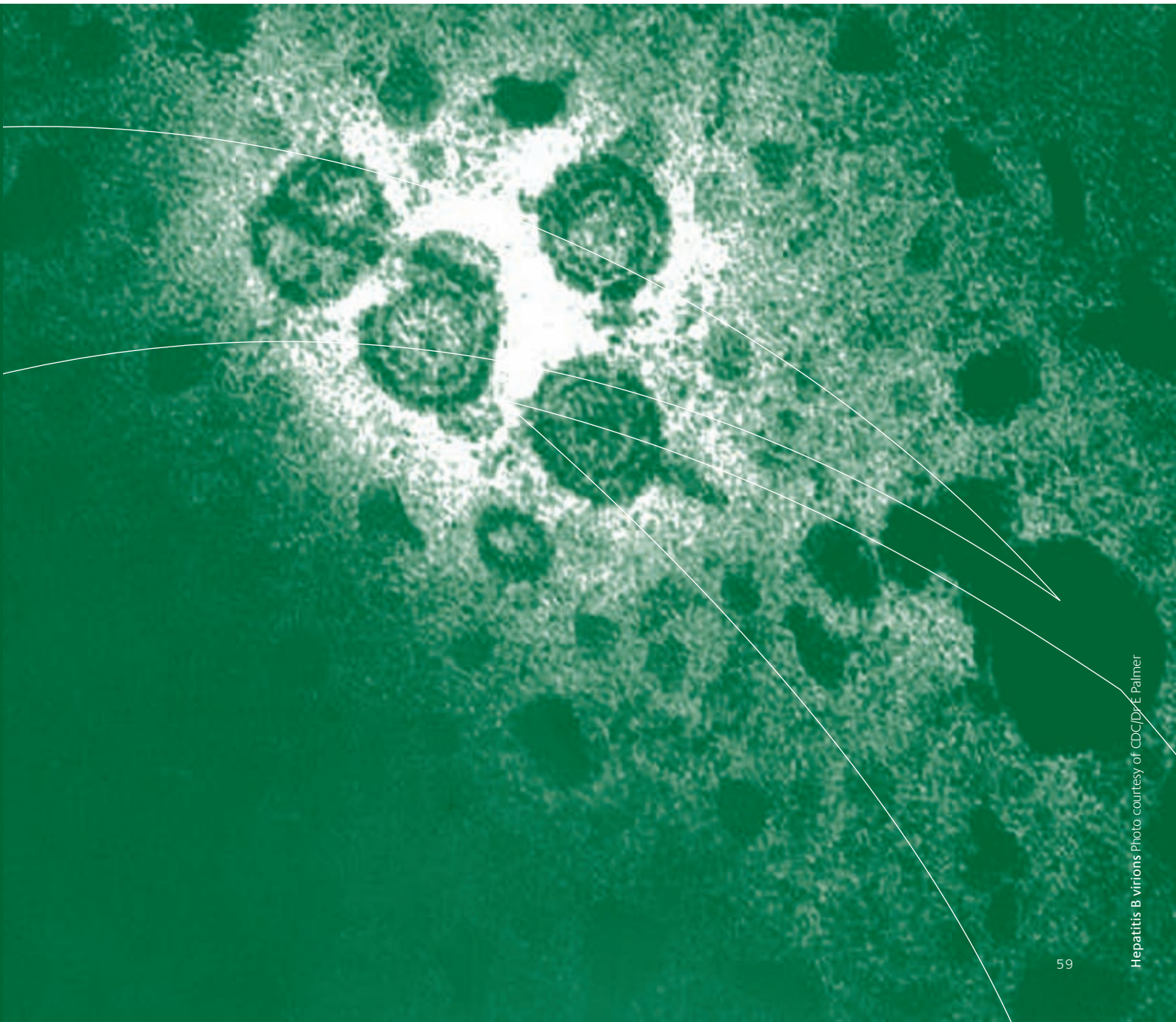
CHAPTER 4 | Hepatitis B



Hepatitis B virions Photo courtesy of CDC/Dr E Palmer

4 Hepatitis B

KEY POINTS

- Surveillance data available indicate that migration appears to have had little impact on acute hepatitis B infection in England and Wales.
- In any given year the majority (96%) of chronic hepatitis B infections newly added to the existing numbers of such infections in England and Wales are likely to be in those born in countries with an intermediate or high prevalence of chronic hepatitis B infection.

Introduction

Hepatitis B virus (HBV) is a blood borne virus that causes hepatitis B infection. The infection may be transmitted via a number of different routes including vertical transmission from mother to child, and horizontally from person to person, through injecting drug use and sexually. Although primarily spread through contact with infected blood, occasionally other infected bodily fluids such as saliva and semen may be involved in transmission.

Acute infection with HBV when acquired in adulthood will often resolve with no long-term health consequences, though it may occasionally lead to fulminant hepatic necrosis which can be fatal. The major health impact of hepatitis B infection arises when the acute infection does not resolve and chronic infection results. Chronic infection increases the risk of developing severe liver diseases such as cirrhosis and primary liver cancer. The virus is the leading global cause of both of these chronic liver diseases and worldwide around 20-25% of people with chronic hepatitis infection will go on to develop progressive liver disease. Many people are asymptomatic and unaware of their chronic infection and consequently will remain undiagnosed until they present with overt disease.

Chronic hepatitis B is defined as persistence of the hepatitis B surface antigen (HBsAg) in the blood for six months or more. The presence of hepatitis B e antigen (HBeAg) is indicative of high infectiousness. The risk of developing chronic infection depends on the age at which acute infection takes place[76]. Chronic infection occurs in about 90% of those infected perinatally. In children infected at between one to five years of age, 20-50% will develop chronic infection. Infection in adulthood leads to chronic infection in around six to ten percent of cases though this risk is increased in those with immune impairment.

Worldwide 350 million people are chronically infected with the virus and it is estimated that up to one million die annually as a result of HBV related liver disease.

The prevalence of chronic hepatitis B infection varies between countries. The World Health Organization (WHO) as divided the world into three distinct areas in relation to the prevalence of chronic hepatitis B infection. High prevalence areas have a prevalence of chronic infection equal or greater than eight percent and include parts of North America, parts of South America, sub-Saharan Africa and most of Asia. Intermediate prevalence areas have a prevalence ranging from two to seven percent and include parts of South America, North Africa, parts of Western Europe, Eastern Europe and the Indian subcontinent. Low prevalence areas with a prevalence estimated to be less than two percent include most of North America, Australia and most of Western Europe including the UK. The main route of transmission of the hepatitis B virus tends to vary according to the prevalence of infection. In countries with a high prevalence of infection, hepatitis B is mainly transmitted vertically or horizontally (non-sexually) from person to person, predominantly in childhood. In intermediate prevalence countries the virus is frequently transmitted sexually or through injecting drug use, although transmission in early childhood also occurs. In low prevalence countries such as the UK, acute infection is primarily acquired in adulthood either sexually or through injecting drug use.

In high income countries chronic hepatitis B infection is sometimes treated with a combination of drugs[77] which can help some cases, patients with severe liver disease are sometimes given liver transplants, and for liver cancer, surgery and chemotherapy can prolong life. These options are, however, very expensive and not available to most patients in low income countries. It is, however, preferable to prevent hepatitis B with vaccine than to try and cure it. Hepatitis B vaccine has an excellent record of safety and effectiveness with over one billion doses used worldwide since 1982. Studies have shown that the vaccine is 95% effective in preventing children and adults from developing acute and chronic infection if they have not yet been infected. Since 1991, the WHO has called for all countries to add hepatitis B vaccine into their national vaccination programmes. As of March 2000, 116 countries had included hepatitis B vaccine in their national programmes including most countries in East and South East Asia, the Pacific Islands, Australia, North and South America, Western Europe and the Middle East[78]. However, many low income countries in sub-Saharan Africa, the Indian subcontinent and the Newly Independent States of the Former Soviet Union do not use the vaccine, a major obstacle to its use being price. The UK has a policy of selective pre-exposure immunisation in groups at risk because of lifestyle, occupation or other risk factors (*e.g.* long-term travel to endemic areas). Immediate post-exposure vaccination is also used to prevent infection, particularly in infants born to infected mothers or following needle stick injuries[79]. Other control measures in the UK to limit transmission to others include screening all pregnant women antenatally for infection[80], screening of blood donations[81] and screening and vaccinating all health care workers[82].

Sources of data and their limitations

In England and Wales hepatitis B is a notifiable infectious disease and therefore clinicians have a statutory duty to notify the local authority of any cases. Notifications will subsequently prompt local investigation and action to control spread of the disease. Notifications are, however, mainly based on a clinical diagnosis rather than laboratory confirmation and acute hepatitis B infection is virtually indistinguishable from other forms of acute viral hepatitis. In addition, chronic cases may also sometimes be notified. The combination of these limitations means that notifications of hepatitis B are not the most accurate source for following trends in the disease incidence. Instead national surveillance of acute hepatitis B infection in England and Wales is based on laboratory reports of confirmed cases of acute hepatitis B infection. Although demographic data are collected on each case, country of birth and ethnic group are not currently routinely collected. In addition, travel information is requested but this field is not always completed. This means it is not possible to

routinely present data on acute hepatitis incidence in terms of these case characteristics. Underreporting of infection may furthermore occur as many cases of acute hepatitis B infection are asymptomatic, symptomatic cases may not be diagnosed, and confirmed cases may not be reported. Estimating the prevalence of chronic hepatitis B infection is also not possible from routine surveillance systems but has been attempted by serological surveys in specific groups *e.g.* genitourinary medicine clinic attendees[83] and antenatal women[84]. The data quoted in this section are drawn primarily from such surveys.

Findings

Laboratory reports to the Health Protection Agency of acute hepatitis B in England and Wales fell from a peak of around 2000 in 1984 to a low of around 500 in 1992. This fall was largely due to a decline in cases in injecting drug users and sexual behaviour modification in response to the HIV epidemic. Since then, between 600 and 800 cases have been reported every year.

In the UK the Department of Health have estimated that the prevalence of chronic hepatitis B infection is 0.3%, equivalent to around 180,000 people living with the infection[85]. This order of prevalence was confirmed by a study that looked at the prevalence of chronic hepatitis B infection in individuals aged 15-44 years using blood samples submitted to 16 microbiology laboratories in England and Wales. The overall prevalence was 0.37%[86]. Although overall this study showed a low prevalence of chronic hepatitis B infection in England and Wales there was a strong association between evidence of exposure to hepatitis B and being born in either Africa or Asia. Furthermore, prevalence within England and Wales varies between inner city and rural areas which also have very different population mixes. This is reflected in the prevalence of HBsAg found among antenatal patients in some inner city urban (1%) and rural areas (0.05% to 0.08%)[84]. A later study looking at the incidence of acute hepatitis B infection reported a higher incidence among individuals who were ethnically South Asian than among other ethnic groups[87], with infections among this group occurring more often during childhood. HBV infection among South Asian children in England and Wales is more common, with transmission in the household and while travelling being more frequently reported. These studies both reflect the global epidemiology of hepatitis B and the higher prevalence of chronic infection in individuals from high and intermediate prevalence countries.

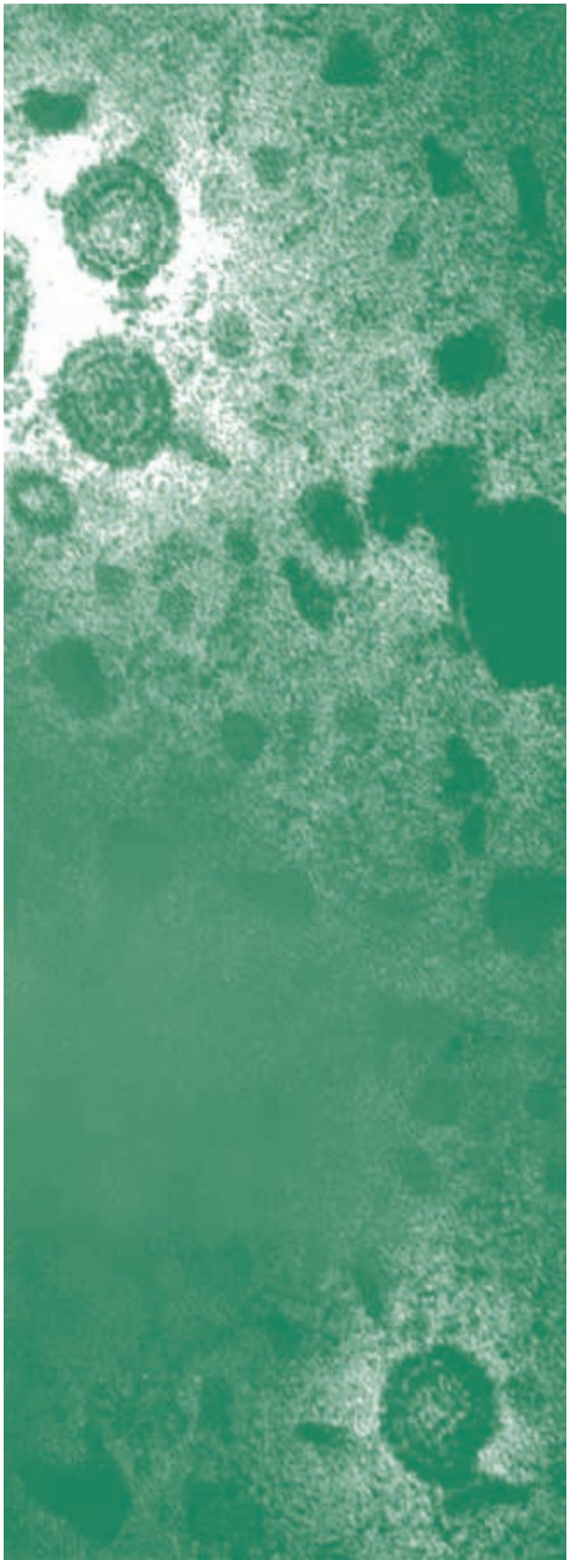
Another study has used data from 1995 to 2000 to attempt to calculate the number of new chronic infections arising within England and Wales from acute hepatitis B infection, and estimate their contribution to the overall burden of chronic cases added to the existing numbers of such infections in England and Wales in any one year[88].
In England and Wales, over this period an average of 673 cases of acute hepatitis B infection were reported annually. Approximately 70% of the cases were in males, and the majority of acute infections occurred in young adults aged 15-24 years and were mainly acquired through injecting drug use and sexual exposure. Taking into account underreporting and the asymptomatic nature of acute hepatitis B infection it is estimated from these data that an average of 3780 new cases of acute hepatitis B infection occurred in England and Wales every year from 1995 to 2000, though it is not possible to determine from the data whether these new infections might have affected the UK born or the non-UK born. Based on what is known about the natural history of hepatitis B infection, modelling estimated 269 cases of chronic hepatitis B infection would have arisen annually from these 3780 cases of acute hepatitis B infection. Between 1996 to 2000, net migration to England and Wales was 90,220 persons[88]. Of these 90,220 persons, modelling (based on WHO estimates of chronic hepatitis B disease in different countries) estimates that 6571 would have been chronically infected with HBV. Chronic infections in migrants can therefore be estimated to account for around 96% (6571/269+6571) of all chronic hepatitis B infections newly added to the existing number of such infections in England and Wales over this period, with only four percent of new chronic infections arising as a result of acute infection diagnosed in England and Wales. The majority of migrants with chronic infection are likely to have acquired their infection in a high or intermediate prevalence country during childhood.

Discussion

Trends in acute hepatitis B infections in England and Wales have remained fairly stable over the last ten years despite an increase in migrants coming from endemic countries. Migration to the UK therefore appears to have had little impact on the epidemiology of acute hepatitis B infection in England and Wales. Acute infections are mainly attributable to transmission through injecting drug use or sexual exposure and specific groups who are at higher risk are targeted for vaccination, notably people who inject illicit drugs, those in prison and those who have multiple sexual partners. There is insufficient information available from routine surveillance as to whether particular population groups having these exposures are more affected than others, which prevents any further refinement of targeting of health messages or interventions.
Travel to endemic areas plays a role in acute hepatitis B acquisition but this information is not always complete. Acute infections are likely, however, to only contribute a very small proportion of all new chronic infections seen in England and Wales each year.

In any given year the majority of chronic infections added to the existing number of such infections in England and Wales can be estimated to occur in migrants to the UK who have been infected in their country of origin. Many of the migrants with chronic hepatitis B infection will have acquired their infection at an early age and therefore any existing UK hepatitis B vaccination policy will be unable to protect existing migrants or new entrants from acute or chronic hepatitis B infection. For this group diagnosis and treatment may, however, contribute to reducing the impact of the infection on their individual health, and awareness of the disease can prevent transmission to others, particularly transmission to babies from their mothers, hence the Department of Health policy on antenatal screening.

While the prevalence of hepatitis B remains high in countries from which some migrants arrive, and with sub-optimal vaccination programmes in at risk groups in the UK, complications related to chronic HBV infection will continue to be a UK health problem.



Hepatitis B - Public Health Recommendations

INDIVIDUAL CARE AND DISEASE CONTROL

The burden of chronic hepatitis B infection and its serious health consequences is likely to fall predominantly on some non-UK born people. Health services managing the consequences of chronic infection therefore need to reflect this with provision of appropriate services for this group, including language support and an understanding of health beliefs about, and cultural attitudes towards, the disease. NICE guidelines for the treatment of hepatitis B should be followed in this group as in any other[77].
Migrants from hepatitis B endemic countries and their health care practitioners need to be aware of their risk of chronic infection. Increased testing for chronic infection will help to identify those who may benefit from treatment and contribute to preventing onward transmission.
In particular there is a need to identify and protect children from ethnic minorities whose parents originate from high prevalence countries, since those infected in childhood are most likely to develop chronic infection. Although recognised infection in children is rare, the incidence of hepatitis B infection is higher in children from certain ethnic minorities[87]. Universal infant immunisation in parts of the country with a high proportion of ethnic minorities may, therefore, be more cost effective than a national programme. Although the consequences of chronic hepatitis B infection are generally managed in secondary care, primary care practitioners are ideally placed to consider the health needs of patients who have migrated to the UK from hepatitis B endemic countries, including testing for chronic infection and offering vaccination to uninfected migrants maintaining links with endemic countries. Such testing should be seen as being conducted primarily for the benefit of the individual, both to avoid stigmatising at risk groups and because there is little evidence of significant transmission to the UK general public.

The general public need to be better informed about hepatitis B and their very low risk of acquiring it through normal social contact, to avoid any misconception that the non-UK born pose a health threat to the general population. This could otherwise lead to prejudice that is unlikely to contribute to overall hepatitis control.

FURTHER RESEARCH/ SURVEILLANCE REQUIREMENTS

Continued surveillance of hepatitis B infection is essential to inform future immunisation strategies. Improvements in data collection by laboratory reports of acute infection (to include details of country of origin, ethnicity and complete recent travel history) will assist in directing appropriate public health action. Further surveys of the prevalence of chronic infection in different population groups will also contribute to the planning of health services related to managing and controlling the disease. Evaluation of the cost effectiveness of screening for chronic hepatitis B infection in the primary care setting is also required. Most migrants with chronic hepatitis B infection will have acquired the infection in their country of origin. It would therefore be useful to review the current UK contribution to hepatitis B prevention programmes in source countries for migrants, and to consider how this contribution might be enhanced.

Health Protection Agency recommendations

Non-UK born communities should have access to culturally appropriate and language supported health services for the management of chronic hepatitis B infection.

NICE guidelines for treatment of chronic infections should be followed.

Awareness of hepatitis B risk needs to be raised in at risk groups and their health care practitioners.

Current Department of Health guidelines on screening those at increased risk of transmitting the disease to others (pregnant women and health care workers) and on immunisation of at risk groups should be followed.

Improvements are needed in routine surveillance of hepatitis B infection to improve information on risk groups and where infection is acquired to help inform appropriate public health action.

Economic evaluation is required to consider the cost effectiveness of testing and vaccinating (where appropriate) all new migrants from high prevalence regions for hepatitis B in primary care.

The current UK contribution to hepatitis B prevention programmes in source countries for migrants should be reviewed with consideration of how this contribution might be enhanced.