The other virus: hepatitis explained

Before HIV there was hepatitis – a potential killer affecting a third of Britain's injectors

Hepatitis is an infection and inflammation of the liver. Hepatitis B is the most important strain in drug users. About 1 in 20 of those infected develop chronic disease with a high risk of cirrhosis and liver cancer. Hepatitis B virus is spread in the same way as HIV but is much more infectious and harder to kill. Preventive measures involve safer drug use and safer sex practices, but effective vaccination is also available though expensive. New treatments are being developed.

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HIV HAS FORCED a fundamental reappraisal of many aspects of clinical practice. One deficiency which has come to light has been the delivery of general health care to drug users. Any independent observer would have mistakenly concluded that before the arrival of HIV there were no infections transmitted by sharing injecting equipment. But in years to come, we may look on the spread of hepatitis B as the great overlooked epidemic.

There are several similarities between hepatitis B and HIV. Both are transmitted among drug injectors and their sexual partners by the sharing of injecting equipment and by unprotected sexual activity. Both have the unusual characteristic of being able to spread through the body, initially bypassing its defensive immune system. Both may result in undetected initial infection and a subsequent carrier state at which stage the virus can unwittingly be passed on to others. Both result in long-term major health consequences which may not be evident until years – or even decades – later.

Hepatitis is an infection and inflammation of the liver resulting from infection by the hepatitis virus. One common strain among the population at large is hepatitis A. Infection can be caused by poor hygiene, eating infected food, or drinking infected water. The effects are unpleasant, but rarely dangerous, and hepatitis A does not persist.

Hepatitis C (formerly known as non-A, non-B hepatitis) has recently been identified among drug users. Doubtless other strains will be identified in the future – already some drug users have become infected by delta hepatitis (see below). However, the form most commonly associated with drug use is hepatitis B (HBV).

After entering the body, the hepatitis B virus crosses into the liver. There it reproduces during an incubation period ranging from six weeks to six months before the development of any symptoms.

In most people it is then inactivated by the body's immune system, but in about 10 per cent of men, and a higher proportion of women, the virus persists. As a result the individual may be infectious to others and will be at major risk of later developing cirrhosis (scarring and destruction of the liver) or primary cancer of the liver – primary in the sense that the cancer develops in the liver itself rather than secondary to cancers elsewhere.

Transmission routes

How is hepatitis transmitted? The transmission routes are the same as for HIV, but the hepatitis B virus is more infectious. Blood is the body fluid which is almost always involved in infections, though this may be small amounts transferred during sexual and other intimate contacts (especially with highly infectious individuals).

Evidence from studies of accidental needlestick injuries suggests that the amount of virus and body fluid required for infection to occur is a great deal less for hepatitis B than for HIV. The hepatitis virus is also tougher than HIV. It may survive heat, cold and drying out – even HIV precautions such as immersion in boiling water will not kill hepatitis B.

Who is at risk? Those mainly at risk of becoming infected are the same groups most at risk of contracting HIV – injecting drug users, those whose immune systems are already impaired, those engaging in unsafe sex practices (generally penetrative sex without a condom), those in intimate contact with chronic carriers, and infants born to carriers. Also at risk will be health care professionals or any other individuals likely to come into contact with potentially contaminated blood.

Are there degrees of infectivity? Yes. Blood is the main risk fluid and is infectious at times when the protein of the virus ('antigen') is detectable in blood.

Following the initial infection there is an incubation period of about three months during which the individual will be symptom free but may be at their most infectious. Many hepatitis-infected people never develop any detectable illness at this stage, even though a substantial minority will go on to become chronic carriers.

How the disease develops

Different individuals will go down different pathways of hepatitis infection during which they either eliminate the virus or become chronic carriers (see figure).

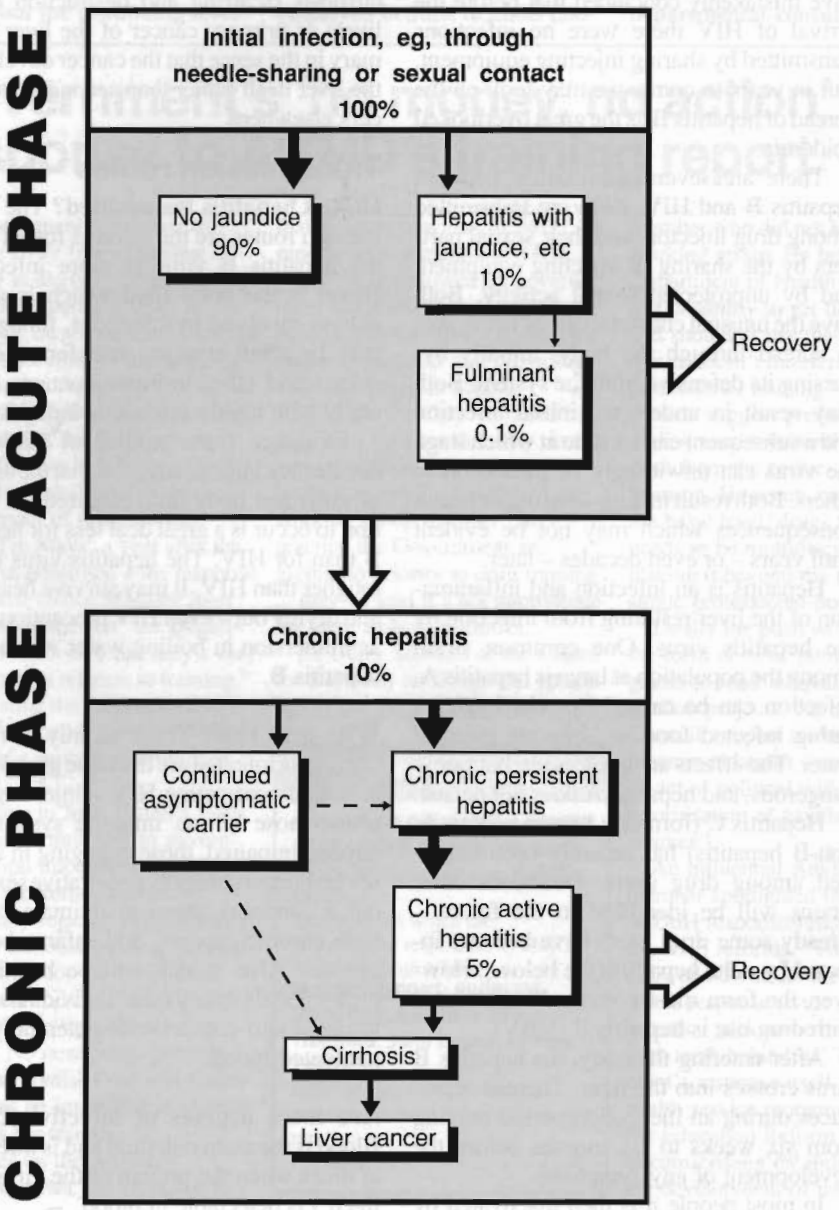
Hepatitis B infection may be mild and go unrecognised, may result in jaundice and general malaise, or rarely may result in a fatal fulminant hepatitis. Approximately 5-10 per cent of those infected go on to develop chronic infection which is likely to result in chronic liver disease such as chronic active hepatitis. This in turn may progress to cirrhosis of the liver and consequent liver failure or cancer.

In the following description, the clinical conditions are described either as *acute* (the months following the original infection) or as *chronic* (continuing over a longer period of time).

Acute phase

In the acute phase of the illness there are a number of possible symptoms and outcomes. The most obvious distinction is between those who develop jaundice and those who do not.

1. **No jaundice**. The individual may exhibit general malaise with fatigue and loss of appetite and weight, or alternatively may have no symptoms at all. The outcome may be clearance of the virus or on the other hand the development of chronic hepatitis.
2. **Ill with jaundice**. This may end with clearance of the virus and recovery or alternatively develop into chronic hepatitis. A very small percentage of people develop full-blown 'fulminant' hepatitis which leads to death in 80 per cent of cases.



Chronic phase

People with impaired immune responses seem more likely to become chronic carriers.

Individuals with chronic hepatitis may nevertheless be asymptomatic showing no signs of disease. Most asymptomatic carriers have normal liver function tests but it is uncertain what will happen in the long term: some will carry the virus for many years without ever developing severe liver disease; others will go on to develop chronic hepatitis and cirrhosis.

Another group of chronically infected individuals do show signs of ongoing liver disease. This occurs when the virus continues to replicate. Chronic *active* hepatitis is associated with symptoms of fatigue and reduced appetite and is more commonly seen in women. Most of these people will eventually develop cirrhosis.

Cirrhosis of the liver involves the progressive destruction of liver tissue which is replaced with fibrous scarring. It is important that ongoing liver disease is detected before extensive cirrhosis has developed as recovery of the liver tissue is not possible once scarring has taken place.

Chronic hepatitis B infection is now the most common cause worldwide for primary liver cancer. Chronic hepatitis B carriers are 250 times more likely to develop this cancer than those uninfected. This occurs mainly in men, often preceded by cirrhosis. Surgical removal of this form of liver cancer is rarely possible making it more difficult to treat.

Additional complications

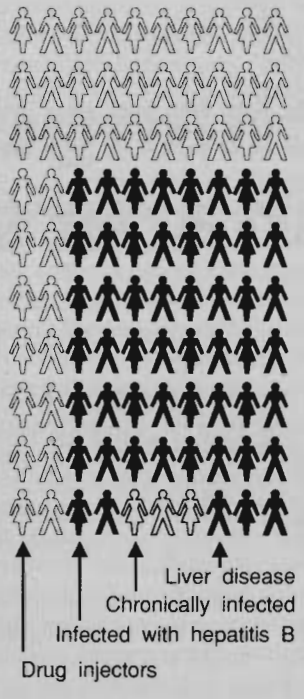
Co-infections. There seem to be different strains of hepatitis B which result in epidemics of different severity. In addition, there are other infections which if they happen at the same time ('co-infection') may alter the severity of hepatitis B infection. Hepatitis C is one example, but the most notable co-infection during the last decade has been the hepatitis delta virus (HDV).

When infections with hepatitis B and with the delta virus occur simultaneously (co-infection) or when the delta infection occurs on top of previous hepatitis B infection (super-infection), the result is a more serious variant on hepatitis B infection with a higher rate of illness and death.

Delta infection can also occur in individuals who are hepatitis B carriers but not exhibiting any signs of illness. Here again the delta virus can transform a quiescent infection into an acute crisis.

In some parts of the world it is becoming increasingly common for injecting drug users to be infected with the delta virus as well as with the hepatitis B virus. For example, in the mid-80s in New York more than half the drug users who had been infected with hepatitis B had also been infected with the delta virus; in Dublin this figure was over 60 per cent. In London the presence of delta virus

Many injectors are infected with hepatitis B but few develop serious illness



is as yet unusual with the proportion only now approaching 10 per cent.

The health consequences of such co-infections should not be under-estimated. For example, in a study of a hepatitis B outbreak in the US state of Massachusetts, eight out of nine deaths from fulminant hepatitis involved co-infection with delta hepatitis.

Hepatitis C was previously known as non-A non-B hepatitis. Originally thought to be mainly transmitted through injecting and blood transfusions, it is now thought also to be sexually transmitted. Hepatitis C infection takes longer to develop than hepatitis B infection but can be more amenable to treatment. It appears to be particularly concentrated among drug injectors.

Pregnancy. During pregnancy, hepatitis B infection can be passed from the mother to the unborn baby. This is particularly likely if the mother has the core protein of the virus present in her blood. The likelihood of infection of the child decreases if the mother has already been a long-time carrier of the virus. Policy in the UK is to selectively screen mothers for antigens of hepatitis B. If the test is positive for surface antigens and there is evidence of viral replication, then the infant is immunised with globulin (see below).

Preventing the disease

Changing behaviour. Prevention involves reducing the extent to which infection occurs in the first place. Today in the drug field several of these approaches would be termed 'harm minimisation' or 'risk reduction'.

These may involve attempts to reduce the extent of drug use or to bring about a shift away from particularly risk-laden drugtaking behaviour. Like HIV, the behaviours of concern around hepatitis are unsafe sex and the sharing of injecting equipment.

Hygiene. For both workers and drug users, the infectivity of hepatitis B demands high levels of hygiene in situations where there is a risk of contact with body fluids such as blood which may harbour the virus. Unlike HIV, there is a significant risk of hepatitis B being transmitted via unwashed shared cutlery, toothbrushes, etc, as well as through transfer of blood or sexual fluids.

Passive immunisation. Another prevention approach which has been available for many years has been passive immunisation, involving the injection of antibodies to the virus. The procedure does not stimulate the body's own defences against hepatitis, so although the protection is immediate it is also temporary.

Passive immunisation is applicable after exposure to hepatitis B (such as a needlestick injury with an infected needle). Antibodies in the form of gamma globulin (which has been taken from a human donor and stored) can be given by an intramuscular injection and confer immunity which may last a few months – sufficient, for instance, to protect a worker over the period of possible infection from a needlestick injury.

Further antibodies in the form of anti-hepatitis immunoglobulin should be given as soon as possible – certainly within 24 hours if possible. Active immunisation should also be started immediately after exposure.

Active immunisation involves administering a vaccine which stimulates the body's own defences against hepatitis, conferring long-lasting protection. This has become available during the last decade – initially with the development of a vaccine from human donors (eg, HB Vax) and more recently with the development of a synthetic vaccine (eg, Engerix B). These attack the envelope of the hepatitis B virus and prevent the establishment of the initial infection.

Early concerns about the transmission of other infections (such as HIV) through the human donor vaccine have proved unfounded and are not applicable to the synthetic vaccine.

It is probable that the expense of the course of three injections of the vaccine (over £30) has restricted its availability to drug workers as well as to drug injectors and their sexual contacts, even though the vaccine has been shown to represent effective prevention for over 90 per cent of the individuals who receive the course.

It is important to note that vaccination against one form of hepatitis does not protect the person from other forms.

Treating the disease

As with prevention, the story of the treatment of hepatitis B infection shows remarkable similarities to the story so far with HIV.

The key message for people with chronic hepatitis is that they need to *abstain from all alcohol* to preserve their liver function. People are also best advised that careful attention to general health and nutrition may benefit overall response to such infections, but there is no clear evidence to indicate that this is actually the case.

Clients need to be encouraged to attend a liver specialist so that progression of the disease may be monitored and to be assessed for the viability of new forms of treatment now becoming available.

Until recently there was very little which could be offered to chronic carriers of hepatitis B. However, in a few centres, specific anti-viral drugs (such as derivatives of interferon) are being given to selected individuals with ongoing liver disease such as chronic active hepatitis.

While such treatment is highly expensive and must be monitored carefully, it would appear to be effective in clearing the circulating virus and hence preventing or reducing not only the risk of infection to others but also the likelihood of progression of the disease.

THERE ARE MANY reasons on personal and public health grounds why hepatitis B should be taken seriously by drug users and drug services. With the identification of the avoidable routes of transmission, and more recently with the development of a highly effective vaccine, it is possible for individuals (and through them their contacts) to be offered protection from the virus and from the associated long-term consequences. For these reasons services which are in contact with drug users should give serious consideration to offering testing for hepatitis B. ■

FOR MORE INFORMATION

■ **KEEP CHECKING DRUGLINK**
Watch out for the announcement of our *Drugs Work* booklet on hepatitis which will build on this article to present a practical guide with handouts for clients/workers.

■ **ISDD'S INFORMATION SERVICE is available on 071-430 1993.**