Hepatitis A virus infections in injecting drug users

NS Crowcroft

The epidemiology of hepatitis A virus (HAV) infection exemplifies the fact that every human infection has a social dimension. Thus the pattern of HAV infection and susceptibility in each country reflects its social history, including its affluence and poverty, its sanitation and overcrowding, and its range of human behaviour. Public health interventions that have improved sanitation and the environment have had the greatest impact on the virus and these improvements have led the more affluent countries through distinct phases in HAV epidemiology from high through intermediate to low incidence. At the beginning of the 20th century hepatitis A was a very common childhood infection in the UK. By the last quarter of the century, however, laboratory reports and notifications were falling steadily, and they reached a nadir at the turn of the millennium. The results of the most recent sero-surveillance study by the Public Health Laboratory Service (PHLS), which compared anti-HAV prevalence in 1986-87 with 1996, implied that hardly any community transmission of HAV was taking place, and the vast majority of the UK population is now susceptible to HAV.

Probably, most Britons now become infected with HAV because their behaviour puts them at risk in some way. Until very recently the most frequently reported behavioural factor associated with this infection was travel abroad to an endemic area; but following the success of HAV vaccination for travellers, injecting drug use has emerged as the predominant risk. The high levels of susceptibility in the British population mean that secondary cases and outbreaks frequently follow such infections, as reported in this issue of CDPH.

The Suffolk outbreak in question exemplifies the fact that hepatitis A virus (HAV) infection can be enhanced through the application of molecular methods to individual specimens. This would allow better detection and definition of outbreaks. HAV sequence-based typing carried out in other countries has shown that IDU outbreaks may be linked across Europe, and it has traced strains back to the countries of origin of the drugs in the Far East. The Health Protection Agency’s Sexually Transmitted and Blood-borne Viruses Laboratory (SBVL) at Colindale has now initiated sequence-based typing of HAV to help define the epidemiology of the virus. We hope this will be a way to track the spread of HAV from IDUs into the general population and improve surveillance.

Outbreaks in IDUs have been recognised for many years and have occurred in many countries. For several reasons IDUs are vulnerable over and above the general population. Their social circumstances are often conducive to transmission. They are usually poor, they lack social support, they are mobile and often homeless, and their socio-economic status therefore becomes the most important factor increasing their risk of HAV. They may inject or wash their injecting equipment in settings such as public toilets where there is a high likelihood of contamination. If they share equipment with others there is the possibility of blood-to-blood transmission, though this route may not contribute in large part to transmission as the period of viraemia with HAV (unlike HCV) is relatively short. Drugs may be contaminated through having been smuggled in the rectum although this is difficult to demonstrate. Finally, because of pre-existing chronic hepatitis B (HBV) or hepatitis C virus (HCV) infection IDUs are more likely to have a bad outcome when they are infected with HAV. Chronic liver damage either from these virus infections or from hepatotoxins such as alcohol or drugs increases the risk of

‘Vaccinating IDUs for HAV is an effective medical solution for a social problem.’

Natasha Crowcroft is a Consultant Epidemiologist in the Immunisation Division at the Health Protection Agency Communicable Disease Surveillance Centre, London.
fulminant hepatic failure following HAV infection.17

If the risk of HAV in IDUs is ignored, it will do nothing to relieve the considerable current burden on health protection teams and health services of dealing with HAV cases and outbreaks, and it will leave the general population at risk. IDUs can protect themselves by stopping injecting, or at least adopting good hygienic practices, which would reduce their risk of acquiring infection. Unfortunately, however, our experience from dealing with other infections including hepatitis B is that it is more difficult to change the behaviour of individuals than to implement a medical intervention.

The medical answer to HAV in IDUs is vaccination.

Several different vaccination strategies could be adopted and the choice depends upon the overall aim of the vaccination, whether short-term or long-term control. The likely success also depends on whether effective points of access to this hard-to-reach population are available. Firstly, vaccination of IDUs can be carried out as a short-term intervention to control outbreaks, as in the outbreak reported in this issue of CDPH by IDUs can be carried out as a short-term or long-term control. The likely success also depends on whether effective points of access to this hard-to-reach population are available. Firstly, vaccination of IDUs can be carried out as a short-term intervention to control outbreaks, as in the outbreak reported in this issue of CDPH by Sundkvist and colleagues. Health protection teams can implement this control measure through use of single-dose HAV vaccine delivered through outreach or in special clinics including mobile services. Such an approach, locally implemented, will not however entirely prevent future outbreaks in this large and mobile population.

Secondly, IDUs can be vaccinated in a selective long-term vaccination programme. Many countries recommend HAV vaccination for individuals whose behaviour puts them at risk, including IDUs. DH guidance from 1996 does not mention the need to vaccinate IDUs unless they have chronic liver disease. PHLS guidance published in 2001 does, however, identify IDUs as a group who require protection and the DH guidance is under review for a new edition of the ‘Green Book’, offering an opportunity to change UK policy.

The IDU population of England is estimated to be more than 130,000 individuals. From the 98 laboratory reports in IDUs in 2002 we can estimate an incidence of 75 cases per 100,000, though this must be a gross under-estimate of the true incidence. It indicates, however, that the community has a significant public health problem considering that universal infant HAV vaccination is triggered by a threshold incidence of 20 per 100,000 in communities in the USA.

A longer-term strategy for HAV, as now suggested by Perrett and others, would be one combined with the current HBV vaccination programme for IDUs, either by giving HAV vaccine separately at the same time as hepatitis B vaccine, or through using combined vaccines. A full course of HAV vaccines has the advantage of a better seroconversion rate 98.9% compared with 94.3% one month after the combined HAV and HBV vaccine, a difference that arises because the combined vaccine includes half as much HAV antigen in each dose. Therefore, the combined vaccine may give insufficient protection if the course is not completed, a likely scenario with IDUs. The better seroconversion rate of a course of HAV vaccine on its own, however, has to be balanced against the possibility that the non-compliance rate may be higher than for each dose of the combined vaccine.

Whichever vaccine, the HAV or the combined HAV/HBV, is chosen the challenge in this population is to find a mechanism that achieves good uptake. Prisons have been identified as effective points of intervention because the majority of IDUs passes through the prison service. In the USA vaccination is recommended for IDUs in prison either alone or in combination with HBV vaccination. Little economic evaluation of different approaches for IDUs has been carried out although vaccination of susceptible individuals with chronic HCV infection is cost effective in some populations and HCV infection is very common in IDUs. Identifying the most cost-effective approach in the UK will require further evaluation as the social context, health and prison services are very different from the USA. Cost-effectiveness analyses should take into account the risks of outbreaks in IDUs extending into the general population.

Vaccinating IDUs for HAV is an effective medical solution for a social problem. But in the same way that HBV transmission may be a marker of risk of other bloodborne viruses, HAV is a marker of other risks which should not be ignored. The impact of injecting drug use on other aspects of health will continue even though HAV virus infection may be brought under control.

Acknowledgements

Thanks go to Julia Granerod, Siew Lin Ngui, Vivian Hope, Kevin Perrett, Philip Mortimer and Val Goalen for their help.

References

27. Prevention and control of infections with hepatitis viruses in correctional settings. MMWR January 24 2003; 52: (RR01); 1-33.