Quarterly Communicable Disease Review
October to December 1996

From the PHLS Communicable Disease Surveillance Centre

Events of the Quarter

From the viewpoint of communicable disease control in the United Kingdom, the fourth quarter of 1996 was dominated by outbreaks of *Escherichia coli* O157 and invasive meningococcal disease. The usual seasonal upsurge of influenza occurred and there were upturns in the number of notified cases of whooping cough and meningococcal septicaemia. The quarter also saw the publication of an updated version of *Immunisation Against Infectious Disease*.

Policy and practice

A new edition of the *Immunisation Against Infectious Disease* was distributed to all medical practitioners in the United Kingdom during the quarter. The new edition presents updated recommendations for immunization in the context of background information, and includes several new chapters, covering indications and contraindications to immunization, anaphylaxis, other adverse reactions, consent, the storage and handling of vaccines, and the immunization of laboratory staff.¹

A voluntary confidential system, known as Serious Hazards of Transfusion (SHOT), for reporting all major complications of blood transfusions, including deaths, in the United Kingdom and the Republic of Ireland was launched in November.² Collated data from SHOT and from the system for reporting infections suspected to have been transmitted by transfusion (coordinated by the National Blood Authority and the Communicable Disease Surveillance Centre), will inform transfusion service policy and clinical guidelines, and will be published at regular intervals.

Trends in reported morbidity

The seasonal upsurge in influenza cases was heralded by two large outbreaks in boarding schools in southern England in mid-November. Influenza virus isolated from cases in these outbreaks and from other cases in the quarter were influenza A virus subtype H3N2. The strains were characterized as A/Wuhan/359/95-like, which was first detected in China in September 1995, and was included in the 1996/97 influenza vaccine as it was expected to appear in Europe in the winter of 1996/97.

Notifications of meningococcal septicaemia continued to rise in the December quarter of 1996. The quarterly total for meningococcal septicaemia notifications, at 304, was 33 per cent higher than that in the corresponding quarter of 1995, whereas notifications of meningococcal meningitis, at 268, were 26 per cent lower than in the December quarter of 1995. The shift towards greater numbers of notifications of septicaemia (without meningitis) probably reflects changes in reporting practice rather than a genuine shift in clinical spectrum of disease, since a significant increase in septicaemia cases would be expected to be associated with increased mortality from meningococcal disease, which has not been observed.

The disease for which the greatest proportional rise in numbers of notified cases was seen between the fourth quarters of 1995 and 1996 was whooping cough, rising from 336 reports in the December quarter of 1995 to 885 reports in the corresponding quarter of 1996. The increase in notified cases was seen particularly in Trent, Northern and Yorkshire, Wales, and Anglia and Oxford, and the greatest age-specific rises in notification rates were seen among children aged 7 to 14 years.

Outbreaks and incidents

An outbreak of *Escherichia coli* O157 infection was identified in Lanarkshire, Scotland, in November. By the end of the quarter, the Scottish Centre for Infection and Environmental Health was aware of 409 affected individuals, including 259 laboratory confirmed cases and 16 deaths. The outbreak was linked to a butcher's shop in Lanarkshire; links included epidemiological evidence and the finding of the outbreak strain of *Escherichia coli* O157 in vacuum-packed cooked beef prepared by the suspect butcher.

An outbreak of *Salmonella goldcoast* associated with the consumption of cheese manufactured in Somerset occurred in England and Scotland during the quarter. A case-control study found an epidemiological association between illness and consumption of 'coloured mild' cheese. The majority of cases lived in north west England or south west Scotland.

An outbreak of meningococcal disease occurred among
students at the University of Wales in Cardiff. Five cases were microbiologically confirmed, and of these two were fatal. All isolates from outbreak cases were characterized as *Neisseria meningitidis* serotype C2aP1.5.

A second outbreak of legionnaires' disease, affecting six people, occurred in Corby in December 1996, following an outbreak of 14 cases in August 1996. Both outbreaks were believed to be associated with the same industrial estate, which covers an area of about 1.5 square miles, and includes large and small industrial premises. Legionellas were cultured from several premises on the estate, an isolate from one case was found to be indistinguishable from environmental isolates from cooling towers in the area.

A human case of rabies was diagnosed in October in a 19 year-old male who had recently returned to England from Nigeria. The clinical diagnosis of rabies was confirmed by direct immunofluorescence and polymerase chain reaction, and culture of rabies virus from tissue specimens obtained at necropsy. Enquiries revealed that the patient had been bitten on the ankle by a stray dog in Nigeria. This was only the twentieth imported case of rabies to have occurred in England and Wales since 1946 (no indigenous cases of human rabies have occurred in the United Kingdom since 1902).

**News from abroad**

An outbreak of community-acquired legionnaires' disease was reported in October from a town about 15 miles to the east of Madrid, Spain. By 18 October, 197 cases of atypical pneumonia had been admitted to hospital and 11 had died; a total of 49 cases of legionnaires’ disease had been confirmed by laboratory investigation. Strains isolated from six cooling towers and two storage tanks in the town were found to be indistinguishable from isolates from outbreak cases.

An outbreak of *Escherichia coli* O157 infection associated with the consumption of unpasteurized apple juice was reported from the western United States and Canada in November. More than 40 cases were reported, twelve of whom were known to have developed haemolytic uraemic syndrome. Unpasteurized apple juice had previously been implicated in an outbreak of *Escherichia coli* O157 infection in the United States but not in the United Kingdom, where less than 1 per cent of fruit juices sold are unpasteurized.

**Publications of interest**

The Advisory Committee on Dangerous Pathogens published its interim report on microbiological risk assessment (MRA).³ The report, which considers the general principles of MRA and its application to public health, was accepted by the Health and Safety Commission and health ministers in the United Kingdom. The Department of Health published an updated report of the unlinked anonymous HIV prevalence monitoring programme in December. The report contains analyses of survey and routine surveillance data from over 200 centres and districts in England and Wales from 1990 to the end of 1995. The report includes a section on implications of the data presented for purchasers, to help them assign priorities for local contracts.³ The tenth report of the Surveillance Unit of the College of Paediatrics and Child Health (formerly the British Paediatric Surveillance Unit), was published in the quarter. The report includes data from studies of AIDS/HIV infection in childhood, *Haemophilus influenzae* infection, congenital syphilis, and subacute sclerosing panencephalitis (SSPE).⁵

**The epidemiology of *Escherichia coli* O157 infection in England and Wales**

In recent years verocytotoxin producing *Escherichia coli* O157 (VTEC O157) has emerged as a pathogen of major public health significance. Recent outbreaks of infection in Lanarkshire and Tayside, which have cost 20 lives to date, serve to underline the importance of this pathogen. Although most of the deaths in these outbreaks were among the elderly, it should be noted that infants are also prone to severe illness.

In England and Wales there is a sharply rising trend in the number of cases (Fig. 1) confirmed by the Public Health Laboratory Service (PHLS) Laboratory of Enteric Pathogens (LEP). This is paralleled by a rise in the number of outbreaks of VTEC O157 infection reported to CDSC. Eighteen outbreaks affecting 173 people, with 102 laboratory confirmed cases, were reported in the period 1992–1994.⁶⁷

Foodborne transmission of VTEC O157 has been shown to occur in outbreaks in various parts of the world. Beef⁹ and dairy produce⁹,¹⁰ are the most commonly implicated foods. The infectious dose of VTEC is extremely low. In one outbreak the median number of organisms per raw hamburger was found to be less than one thousand.¹¹ In another outbreak, the estimate of the most probable number of organisms in the beefburger sample was less than two organisms per 25 g sample of meat. The cooked burgers would thus have carried considerably fewer viable organisms. Infection has also been associated with the consumption of water,¹² vegetables,¹³ and fruit juice.¹⁴ Person-to-person spread¹⁵,¹⁶ and contact with livestock¹⁷,¹⁸ have also been documented as important modes of transmission in outbreaks in Europe and North America.

Most cases of VTEC O157 infection in England and Wales appear to be sporadic. In the period 1992–1994, only 102/1266 (8.1 per cent) of strains confirmed by LEP were from cases which were known to have acquired their infection in recognized general outbreaks. The epidemiology of sporadic VTEC O157 infection is poorly understood. However, the PHLS is conducting a case-control study of sporadic VTEC O157 infection in England in order to identify and estimate the relative importance of particular risk factors. The study began in October 1996 and will run until the end of 1997.

VTEC O157 infections cause a wide range of illnesses ranging from mild diarrhoea to Haemolytic Uraemic Syndrome **strange line**
(HUS)\(^9\) and thrombotic thrombocytopenic purpura (TTP). Of diagnosed cases of VTEC O157 infection 33–50 per cent are admitted to hospital and 2–7 per cent develop HUS.\(^{20}\) In outbreaks the proportion of cases that develop HUS may be higher, with rates as high as 30 per cent being reported.\(^9\)

HUS caused by VTEC O157 infection is believed to be the most common cause of acute renal failure in children in the UK and North America. Some cases may have long term sequelae, e.g. hypertension and end stage renal failure.\(^{21}\) Mortality among HUS cases caused by VTEC O157 infection is in the range 3–7 per cent.\(^{22,23}\)

The UK Collaborative Study of Childhood HUS started in February 1997. The study was set up to investigate the epidemiology of childhood HUS. This is a three year surveillance programme and is being conducted by: the Surveillance Unit of the Royal College of Paediatrics and Child Health (SU); the British Association of Paediatric Nephrology (BPA); the PHLS; the Scottish Centre for Infection and Environmental Health (SCIEH); and the Aberdeen Royal Hospitals NHS Trust.

The last surveillance programme for childhood HUS in the UK ended in 1988. Reporting of O157 VTEC has risen sharply since then. Eighty-eight cases were confirmed by laboratories in the UK in 1988, by 1996 this had risen to 1158. It is therefore important to determine how the rise in the incidence of O157 VTEC in the community has affected the epidemiology of HUS.

In the new study, paediatricians will be encouraged to report cases of clinically diagnosed HUS directly to the Communicable Diseases Surveillance Centre or SCIEH by telephone at the time of diagnosis in addition to using the SU report card. Clinical and epidemiological data will then be collected from paediatricians using a structured questionnaire. Routine faeces and serum samples taken from patients, will initially be sent to local microbiology laboratories, isolates and sera will then be referred to the PHLS LEP and the Royal Hospital in Aberdeen for microbiological confirmation and typing. Information from paediatricians will be cross matched with data from the reference laboratories. It will therefore be possible to establish the microbiological causes of HUS and estimate the proportion of cases of disease caused by O157 VTEC and VTEC of other serogroups.

A follow-up questionnaire will be issued to each paediatrician one year after the initial diagnosis of each reported case in order to collect longer term morbidity and mortality data.

By means of initiatives such as these we will learn much more about the epidemiology of VTEC O157 infection.

**Meningococcal infection**

In 1996, 2313 cases of meningococcal meningitis and/or septicaemia were notified (provisional figures), a 27 per cent increase on 1995 and the highest recorded figure since reporting of septicaemia began in 1989. Most of this increase was due to a rise in notifications of meningococcal septicaemia, although notifications of meningococcal meningitis also rose slightly (Fig. 2). Some of the increase in notifications of meningococcal septicaemia may be due to improved ascertainment.

Meningococci can be classified into 12 serogroups. Serogroup B is responsible for the majority of culture confirmed infections in the UK, with most of the remainder due to serogroup C. Over the last two years, the proportion of isolates identified as group C has risen from 26 to 39 per cent (Fig. 3) with Group B falling
from 70 to 56 per cent of the total. There is currently no vaccine available against group B organisms. A polysaccharide vaccine against group C is currently available, and a conjugated group C vaccine, which has the potential for use in infancy and induces immunological memory, is nearing the completion of Phase II trials in Gloucestershire and Oxfordshire.

New guidelines on the management of clusters of meningococcal disease were developed by the PHLS Meningococcus Working Group and Public Health Medicine Environmental Group. This revision followed a review of the clusters that occurred in England and Wales between 1 April 1995 and 1 March 1996. The guidelines define 'confirmed', 'probable' and 'possible' cases of meningococcal infection and recommend that public health action is indicated for confirmed and probable cases, but not for possible ones. The guidelines also re-emphasize the importance of a full microbiological investigation of all suspected cases on admission. Intervention is recommended for defined target groups if two confirmed or possible cases occur in the same school or preschool group within four weeks. Further advice is recommended for clusters in Universities or in the wider community. Such sources of advice include regional epidemiologists, CDSC (Colindale), MRU and Gloucester Public Health Laboratory.

Following the revision of the guidelines, but prior to their publication, seven cases of meningococcal infection occurred among students at the University College of Wales, Cardiff (UWC) – two of whom died. The cases occurred between mid-October and early December 1996, and six cases lived in the same hall of residence. UWC has approximately 14,000 students, of whom 750 live in the affected hall. Three cases (including the one not living in the hall) were confirmed by culture and identified by the PHLS Meningococcus Reference Unit (MRU) as serosubtype C2aP1.5. Two further cases were confirmed as group C by PCR and latex agglutination. Of the remaining two cases, one was confirmed by PCR but remains untyped and one remains unconfirmed.

The first two cases at the hall were just over four weeks apart (onset 15 October and 16 November), lived in different residential blocks and attended different courses. An outbreak was declared on 29 November after a third (fatal) case had occurred in a resident at the hall the previous evening. Mass prophylaxis with ciprofloxacin of all students and staff at the hall commenced on the evening of 29 November, followed by a meningococcal AC immunization programme. Over 1000 doses of both were given over the next few days. Two further cases occurred in hall residents (on 29 November and 1 December) of whom one died.

The recently revised PHLS guidelines on meningococcal infection were reviewed in the light of the experience gained in this outbreak. The committee reviewing the guidelines concluded that they did not require amending.

**HIV and health care workers**

The overall risk of transmitting HIV to a patient during an exposure prone procedure is likely to be very small. There have been only two reported incidents; a Florida dentist who transmitted HIV to six patients, and a French orthopaedic surgeon who transmitted infection to one patient. Look
back studies of over 22,000 patients of infected HCWs have failed to show any evidence of transmission of HIV to patients. Only a proportion of these 22,000 patients, however, had exposure prone procedures, and not all patients were tested. About 4500 patients were notified in six studies undertaken in the United Kingdom before 1997. None of the 1300 patients who chose to be tested for HIV were found to be infected.

UK guidance on the management of HIV-infected HCWs including notification of patients was published in 199328 and 1994.29 Two patient notification exercises have recently taken place.30,31 The first of these in February 1997 involved 38 patients and the second 1752 patients.

The risk faced by Health Care Workers in procedures on HIV infected patients is documented at around three per 1000 percutaneous exposures. Italian and US data confirm the risk of HTV seroconversion is higher for exposures involving:

1. deep injuries;
2. visible blood on the device causing injury;
3. a hollow bore needle that had been in the source patient’s vein or artery;
4. a source patient who went on to die of AIDS within 60 days of the occupational exposure.

A case control study using data from the UK, France and USA was published in December 1995.32 The low levels of seroconversion following needlestick injuries and the fact that higher risk exposures were more likely to have used post exposure prophylactic drugs, make the interpretation of the data in this retrospective case control study complex. However, adjustments for the type of risk exposure suggest that a significant reduction is obtained by the prompt use of zidovudine as post exposure prophylaxis. Zidovudine resistance is recognized; zidovudine failures when used as post exposure prophylaxis have occurred; and in clinical use combination therapy is better than monotherapy. All these reasons have been used to argue that if monotherapy has been shown to be beneficial as post exposure prophylaxis then dual or triple therapy will be even better. In the US33 the Centre for Disease Control now recommend triple therapy for the highest risk exposures and the Expert Advisory Group on AIDS has made similar recommendations for the UK.

Report prepared by GK Adak, B Evans, ON Gill, J Hawker and edited by M Catchpole.

References


30. Notification of patients exposed to a doctor infected with HIV. *Comm Dis Rev* 1997; 7: 75.

31. Health authorities notify patients exposed to a health care worker infected with HIV. *Comm Dis Rep* 1997; 7: 93.


33. Update: Provisional public health recommendation for chemoprophylaxis after occupational exposure to HIV. *MMWR* 1996; 45: 468–472.