Clinical Topics

Changing patterns of communicable disease in England and Wales

Part I—Newly recognised diseases

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Campylobacter enteritis, giardiasis, legionnaires’ disease, primary amoebic meningoencephalitis, and the viral haemorrhagic fevers are among the “new” diseases. In hospitals group B streptococcal infections have been recognised, there have been episodes of hospital-acquired enterovirus infections, and developments in surgical prostheses and immunosuppression have been followed by the appearance of new infections due to low-grade opportunistic pathogens.

Campylobacter enteritis

Until the 1970s Campylobacter spp were regarded as vibrios that caused diarrhoea in cattle and other animals and rare bacteraemic infections in man. Following the recognition that C jejuni/coli (C fetus subsp jejuni) causes human diarrhoeal disease and the development of simple laboratory methods for identification this organism has become the commonest pathogen isolated from the faeces of patients with sporadic acute diarrhoeal illness (about 5% of such patients). Two hundred new cases are now reported to the Communicable Disease Surveillance Centre (CDSC) each week. As routine investigations do not show a microbial cause for most sporadic episodes of acute diarrhoeal illness, campylobacter enteritis may have been common for many years. It is too early to consider trends in this disease.

The incubation period of campylobacter enteritis is two to five days. The typical symptoms are diarrhoea and abdominal pain, sometimes with fever, rarely with vomiting or dehydration. The abdominal pain may be so severe as to suggest acute appendicitis. All age groups are affected. Most cases are sporadic or in small family clusters, where an association with eating chicken has been observed. Contact with infected dogs (who also have diarrhoea) and cats has been reported. Large outbreaks of campylobacter enteritis have occurred after the consumption of unpasteurised milk and waterborne infection was suspected in one American outbreak. Person-to-person spread seems to be unusual, even in schools, hospitals, and other institutions. The exact mode of spread of this organism cannot be ascertained until reliable methods for subtyping the organism have been developed.

Giardiasis

Unlike the agents of the other “new” diseases, Giardia lamblia has been found in the intestinal contents of people with diarrhoea for many years. What has been uncertain is the pathogenic significance of the finding. Recent outbreaks of diarrhoeal disease, however, in particular an outbreak among travellers to Leningrad in 1974, have given definite epidemiological evidence of the association between giardia and disease. Now giardiasis is the commonest protozoal disease reported to CDSC, with over 3000 cases a year.

Giardiasis affects people of all ages. In Britain most detected infections are in people who have recently returned from the...
tropics, the Middle East, or Russia, who are also the most likely to have their faces examined for parasites. The main source of infection is untreated drinking water, which need not be demonstrably contaminated by human excreta. Infection has been acquired from the water of remote mountain streams. Transmission may also occur by the faecal-oral route within families or institutions.

Illness develops one to two weeks after exposure and starts as an explosive watery diarrhoea without blood or mucus and often accompanied by pale fatty stools and abdominal pain and nausea. The illness lasts three to four days except in a few patients who are left with chronic diarrhoea. The diagnosis can be made by microscopy of fresh faecal specimens, but cysts may not be detectable in the faeces until after the acute illness has subsided.

Legionnaires' disease

An outbreak of severe respiratory disease affecting 182 people at an American Legion convention in Philadelphia in 1976 led to the discovery of an apparently new bacterium now known as Legionella pneumophila. Subsequent studies have shown that it causes a wide spectrum of respiratory disease and that it has been present since at least 1947. Six serotypes of L. pneumophila have been recognised and recently a group of atypical legionella-like organisms has been described which also cause respiratory illness.1

In Britain an outbreak of respiratory disease among holiday-makers returning from Spain in 19732 was the earliest recognition of the disease; a group of unrelated cases was described in Nottingham in 1977, and subsequently over 200 cases have been reported to CDSC. These showed a seasonal incidence with a peak in the late summer; all were in adults, about one-third those aged over 60 years, and 20-22% in men.2 About a quarter of the patients acquired the infection abroad, usually in holiday resorts on the Mediterranean. No person-to-person spread was observed in any of the incidents investigated. Two small common-source outbreaks were identified, one in a hotel with a contaminated water supply3 and the other, which comprised two cases, in a renal transplant unit probably infected by contaminated water in a shower unit.4 In the outbreaks in the USA an association with airborne spread from air-conditioning plants has been reported. These incidents and the isolation of L. pneumophila from surface waters provide evidence for its environmental origin and show possibilities for prevention.

Primary amoebic meningoencephalitis

Meningitis has long been recognised as a systemic complication of Entamoeba histolytica infection, but two free-living amoebae have recently been shown to cause a primary meningoencephalitis, Acanthamoeba producing a chronic illness usually in the compromised host and Naegleria fowleri causing an acute illness in healthy young adults.5 Primary amoebic meningoencephalitis caused by N fowleri was first described in Australia in 1965,6 although later histological studies indicate the existence of the disease as early as 1909. The organism is widespread in the environment, especially in natural warm freshwater springs and in thermally polluted fresh water. It is thought to gain access to the brain through the olfactory epithelium of the nose and olfactory nerves. Many cases have followed energetic swimming or diving. After an incubation period of three to seven days a purulent meningoencephalitis similar to bacterial meningitis develops and is usually fatal in 24 to 72 hours. The cerebrospinal fluid is bacteriologically sterile but contains amoebae. There have been a few reports of recovery after early treatment with amphotericin B.

Over 100 cases have been reported worldwide, of which six were in Britain, two of them diagnosed retrospectively.7 In 1969 three cases were reported in children who had been playing in a warm muddy rainwater puddle8 and in 1978 another case occurred in a girl who had been swimming in a public bath partially filled with water from a warm spring.9 In well-maintained swimming baths chlorination with 2 ppm residual chlorine for 30 minutes and the maintenance of a free chlorine level of 0·5 ppm in the pool is probably adequate to ensure safety, provided that gross contamination with organic material is avoided.10

Viral haemorrhagic fevers

The recently described African viral haemorrhagic fevers, particularly Lassa fever, have assumed importance in Britain because of the greatly increased air passenger traffic between Britain and West Africa.11

LASSA FEVER

Lassa fever is a zoonosis; the virus causes a chronic symptomless infection in a small rat, Mastomys natalensis, which inhabits rural areas of Africa and is probably transmitted to man in rat-infested dwellings by direct contact or indirect contact with materials contaminated with infected rats' urine.12 The incubation period is three to 17 days (three to 21 days is accepted for common-source outbreaks), and the disease usually presents as a non-specific continuous fever resembling typhoid fever, with prostration out of proportion to the pyrexia and sometimes with an exudative pharyngitis.

The first recognised outbreak took place in a mission hospital in Lassa, north-east Nigeria, in 1969 and comprised three cases with two deaths.13 In a second outbreak of 28 cases and 14 deaths in Jos, Nigeria, early in 1970 there was evidence of airborne case-to-case spread of the disease,14 and when two laboratory workers became infected in the United States at about the same time, one of whom had no known association with work on Lassa virus, airborne spread was suspected of being the main mode of person-to-person transmission. Subsequent experience has, however, shown that spread from the respiratory tract is unusual and that the main risk of person-to-person transmission is by direct contact with blood, urine, secretions, and body fluids of infected patients.15

There were five reported cases of Lassa fever imported into the United Kingdom from 1969 to 1976 and a further case in a patient travelling through Heathrow airport to the United States; three of the patients were ill on arrival and three were convalescent. No spread of infection took place.

The control measures adopted are set out in the Department of Health and Social Security memorandum on Lassa fever.16 Since 1976 no further importations have been reported, but there have been 30 to 40 suspected cases each year admitted to high security isolation accommodation, in about half of which the final diagnosis was malaria. Early exclusion of such eminently treatable diseases as malaria and typhoid in all cases of suspected Lassa fever is thus important, and special laboratory facilities are available for the purpose in certain centres.

MARBURG AND EBOLA VIRUSES

Marburg and Ebola virus diseases are also zoonoses, although the host animal(s) have not been identified. The viruses are morphologically identical but antigenically different and cause the same clinical illness. The incubation period is three to nine days in Marburg disease and four to 16 days in Ebola virus disease (as in Lassa fever, three to 21 days is suggested for control purposes). The diseases present as a febrile illness of sudden onset and are characterised by a maculopapular rash between the fifth and eighth day of the illness. The first outbreak of 31 cases of Marburg disease took place in Marburg, Frankfurt, and
Belgrade in 1967 in people handling the tissues of one batch of vervet monkeys or in their close contacts. A second outbreak of three cases was reported in South Africa in 1975, the index patient having hitch-hiked through central Africa. A third outbreak of two cases occurred in Kenya in 1979; the index patient, who died, had worked on a sugar plantation in southern Kenya and the secondary case occurred in his medical attendant. In 1976 two large outbreaks of Ebola virus disease occurred in the Sudan and Zaire, and in 1979 the disease reappeared in the same area of southern Sudan. A British laboratory worker acquired the infection after a minor laboratory accident while working with the virus from the first Sudan outbreak, but there have been no other reported cases of these diseases in the United Kingdom. Person-to-person spread takes place as in Lassa fever, by close personal contact with blood, urine, or secretions of infected patients, and in the Marburg outbreak transmission in semen by sexual intercourse during convalescence was described. The same control measures as for Lassa fever apply.

**Group B streptococcal infections**

Although the methods for isolating and identifying group B streptococci (Streptococcus agalactiae) have been practised for many years, human infections were rarely reported until Hood et al.1 and Eickhoff et al.2 described neonatal sepsis from this organism. Since then group B streptococci have become one of the commonest reported causes of early neonatal sepsicaemia and meningitis. The incidence of this disease probably did increase in the past two decades, although there is no satisfactory explanation for it. The strains causing human disease are distinct from those that cause mastitis in cattle. It is not clear whether the observed variation in vaginal carriage rates in pregnant women (5-20%) results from real differences between populations or from differences in sampling and bacteriological technique. Group B streptococci are carried in the rectum and are also found in the throats of healthy people.

Neonatal group B streptococcal disease has two forms: a commoner “early-onset” septicemia illness and a “late-onset” meningitis. The early onset form occurs within a few days of birth. It is characterised by shock and respiratory distress and has a high mortality (50%) even if treatment (penicillin and gentamicin) is started early. The causative organisms isolated from the babies are usually identical with the type present in their mothers. Thus it is presumed that infection is acquired in labour, possibly in utero because the illness may develop within an hour or two of birth, and babies born by caesarian section are sometimes infected. Identification of risk factors such as maternal carriage, low birthweight, or prolonged or complicated labour may define a group of babies who might receive prophylactic chemotherapy, but the value of such a procedure is uncertain because Escherichia coli and Staphylococcus aureus are still important causes of neonatal infection. The late-onset form of the disease is a purulent meningitis; it is not known whether the infecting organism (commonly type III) is acquired from the mother or other members of the family. Although small clusters of group B streptococcal disease have occurred in neonatal units, the strains isolated have been of various types, and no common source of infection has been found. There is still much to be learnt about this new disease, but despite its position among serious neonatal infections clinical experience of cases (no more than 1-3/1000 live births and often less) has taken time to accumulate.

**Enterovirus infection in neonatal units**

The outbreaks of echovirus type 11 in neonatal units which received publicity in 1978 show how new problems of infectious disease can arise when medical and social developments bring together new groups of susceptible individuals. The enteroviruses are endemic in the general population, with a higher number of infections in summer. A few virus types tend to predominate, which vary from year to year. The illnesses are generally sporadic and varied, with a few clusters in residential institutions. Premature and sick neonates are, however, more likely than older children to have a severe illness if they become infected. In the recent echovirus 11 outbreaks a distinctive fulminating haemorrhagic condition was observed, as well as meningitis, apnoeic attacks, and fever.

Enteroviruses are brought into neonatal units by mothers, staff, and visitors, who are usually asymptomatic. Isolation or exclusion of people with overt infection may reduce the risk of an outbreak, but good hospital hygiene is probably as important. Early detection of an outbreak may help to allow strict hygiene and possibly prophylactic immunoglobulin or a competitive vaccine virus to be applied in time to prevent deaths.

**Infections with low-grade pathogens**

The practice of immunosuppression and chemotherapy together with the improved survival of patients with poor defences against infection has resulted in an increasing number of infections with “low-grade” pathogens. These infections must be seen in proportion to the more common and more lethal infections with well-known pathogens such as Staph aureus. Coagulase-negative staphylococci, once regarded simply as skin flora, infect prosthetic shunts, heart valves, and joints. Infection may happen at the time of insertion and remain undetected for months, while the tissues around the prostheses are damaged. The commonest prosthetic infection reported to CDC is meningitis associated with atriocentral shunts. Bacteremic infections due to this class of microbe may be difficult to distinguish from contaminated blood cultures and may therefore be under-reported.

Pseudomonas aeruginosa infections have long been known to be a serious problem in patients with burns. More recently infections with these bacteria and other multiple-antibiotic-resistant Gram-negative bacilli such as Klebsiella spp, Enterobacter spp, and Serratia spp have caused outbreaks in intensive care units. Such organisms survive and multiply in wet environments, but they need selective pressures from antibiotic usage and highly susceptible hosts to cause much infection. Pneumocystis carinii, a protozoon, is a rare cause of pneumonitis, which occurs only in immunosuppressed patients, typically children on treatment for acute leukaemia. Toxoplasma gondii is a commoner protozoal infection, which is usually symptomless; rarely it causes generalised lymphadenopathy and fever. Congenital toxoplasmosis is, however, a serious but rare cause of mental retardation and blindness. Infection is thought to originate from cats. Systemic fungal infections, with Candida albicans infecting various tissues, Aspergillus spp infecting the lungs, and Cryptococcus neoformans causing meningitis, are complications of prolonged immunosuppression. Endocarditis due to C albicans and other low-grade pathogens is also a complication of heart valve replacement. Herpesvirus hominis (simplex) normally causes only minor localised lesions on primary infection and reactivation but can cause severe generalised infection in patients with reduced immunity, particularly after renal transplantation. Cytomegalovirus infections, normally subclinical, may lead to pneumonitis or hepatitis in the immunosuppressed and possibly are associated with graft rejection in renal-transplant patients.

**References**


Letter from . . . Chicago

Paranormal events

GEORGE DUNEA

Walking through the ragged mountains of Virginia, his excitable imagination inflamed by the morphine without which he could not exist, the melancholy Augustus Bedloe was suddenly startled by the loud beating of a drum. A minute later a shrieking half-naked dusky man rushed past him, closely pursued by a huge growling hyena. Overcome by terror he sat down beneath a tropical palm tree. Readers of Edgar Allan Poe will remember how minutes later Mr Bedloe found himself in the holy city of Benares, fighting the onslaught of the mutinous crowd, now advancing against the rabble, now retreating, now rallying again, until suddenly he was fatally struck in the temple by a poisonous arrow. That night his soul surveyed the silent city, took a disinterested look at his greatly swollen corpse, and gently flitted back to the mountains of Virginia. His physician, the learned Dr Templeton, an expert in magnetism and mesmerism, heard the story without surprise, having personally known a Mr Oldebr who had died 47 years earlier during an insurrection in Benares; and, struck by the remarkable physical similarity between his deceased friend and his patient Bedloe, he had already tentatively concluded that the soul was “on the verge of some stupendous psychical discovery.” Unfortunately he clumsily put an end to his studies by inadvertently treating his patient’s fever and head congestion by applying a poisonous leech to his temple.

To the best of our knowledge neither the gloomy Mr Bedloe nor his namesake spelt backwards have given further signs of participation in the affairs of this world. But Dr Templeton might have been interested in the case of Ms Loretta Lynn, the singer who recently admitted under hypnosis that she had been King George I’s girlfriend. For years she had lived in terror, aware that the king’s best friend was trying to seduce her and fearful that the king was going to be murdered. But in 1760 the king suddenly died from a dissecting aneurysm, and the mistress survived only long enough to be strangled by the perfidious friend. Somewhat on the same lines, in Equality, Illinois, an elderly arthritic woman recently disappeared from her home and was nowhere to be found. The police strongly suspected murder, the woman being so crippled that she would have been unable to walk any distance. On turning in desperation to some local psychics they were informed that the body could not be found until the remains of a man were first discovered. Ten days later someone brought in the skull and bones of an unknown man.

With the help of an appropriate stipend one of the psychics now went into a trance and transformed himself into the missing lady, walking and talking like her even though he had never met her, and at last leading the investigators to the site where the body was hidden.

From the University of Virginia, meanwhile, two psychiatrists...