23 Meningococcal

23.1 Introduction

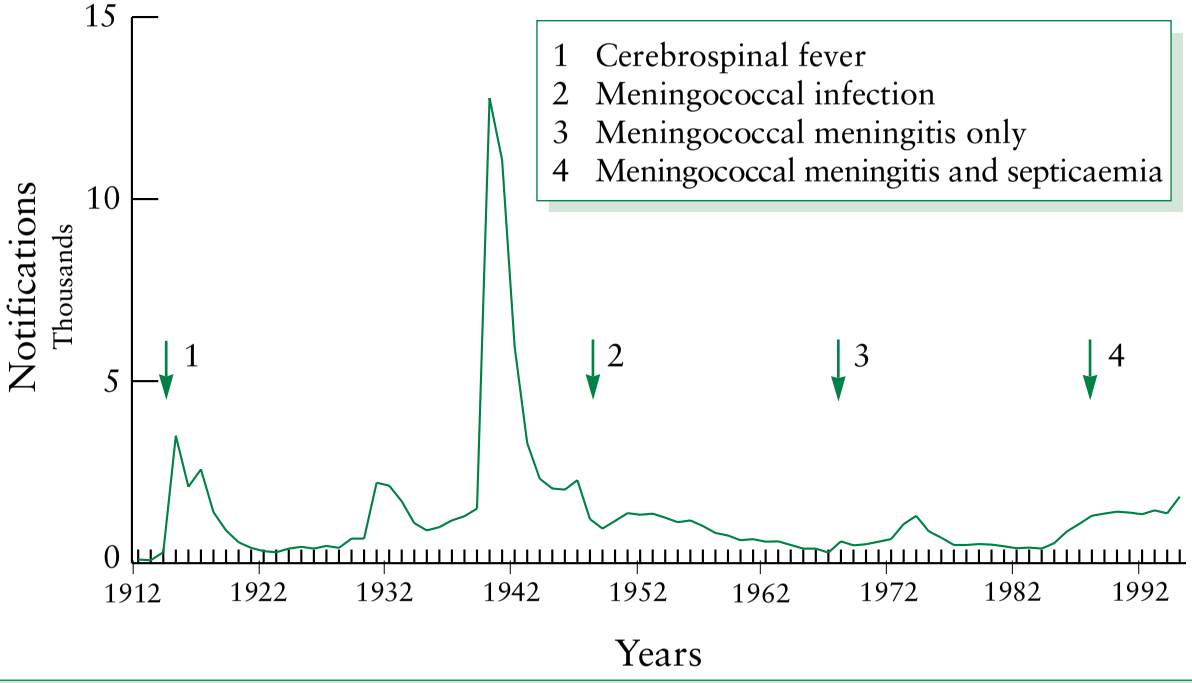
23.1.1 Meningococcal meningitis and septicaemia are systemic infections caused by *Neisseria meningitidis*. Meningococci are Gram negative diplococci which are divided into antigenically distinct groups, the commonest of which in the UK are B, C, A, Y and W135. They are further subdivided by type and sulphonamide sensitivity.

23.1.2 Group B strains account for approximately two thirds of all isolates submitted to the Public Health Laboratory Service Meningococcal Reference Laboratory. Group C strains contribute about one third, but some years can be higher. Group A strains are rare in this country (less than 2%) but are the epidemic strains in other parts of the world.

23.1.3 Irregular upsurges of meningococcal infection occur in the United Kingdom with the last previous wave in the mid 1970s. The present upsurge began in 1984: there were peaks in 1989/90 and 1995/6. The disease is commonest in the winter. An association has been demonstrated between the seasonal onset of influenza activity and meningococcal disease. The incidence of meningococcal disease is highest in infants followed by one to five year old children, but the recent increase of Group C disease has been associated with an increased incidence in school age children and young adults.

Notifications of meningococcal infection to ONS

England and Wales (1912-1995)



■ 23.1.4 The carriage rate for all meningococci in the normal population is about 10% although rates vary with age; about 25% of young adults may be carriers at any one time.

■ 23.1.5 Meningococci are transmitted by droplet spread or direct contact from carriers or from individuals in the early stages of the illness; the probable route of invasion is via the nasopharynx. The incubation period is two to three days, and the onset of disease varies from fulminant to insidious with mild prodromal symptoms. Early symptoms and signs are usually malaise, pyrexia and vomiting. Headache, photophobia, drowsiness or confusion, joint pains and a typical haemorrhagic rash of meningococcal septicaemia may develop. **Early on, the rash may be non-specific.** The rash, which may be petechial or purpuric, does not blanche and this can be confirmed readily by gentle pressure with a glass, when the rash can be seen to persist. Patients may present in coma. In young infants particularly, the onset may be insidious and the classical signs absent. The diagnosis should be suspected in the presence of vomiting, pyrexia, irritability and, if still patent, raised anterior fontanelle tension.

■ 23.1.6 Overall mortality from meningococcal infection is around 7-8% and has changed little for 20 years. Meningitis is the commonest presentation, but in about 15-20% of cases, features of septicaemia predominate. Mortality is 3-5% in meningitis and 15-20% in septicaemia. Current expert advice endorses the importance of early recognition, prompt antibiotic treatment and speedy referral to hospital for all suspected cases. Benzylpenicillin is the antibiotic of choice and should be administered by the general practitioner before transfer to hospital. The recommended dose is 1,200 mg for adults and children aged 10 years or more, 600 mg for children aged 1 to 9 years, and 300 mg for those aged less than 1 year. Benzylpenicillin should be withheld if there is a known history of anaphylaxis following previous penicillin administration. Although benzylpenicillin may reduce the chance of isolating the causative organism, this is outweighed by the benefit to the patient, and new techniques are becoming available that facilitate the diagnosis of meningococcal disease even after antibiotics have been given.

23.2 Vaccine

23.2.1 Currently available meningococcal vaccine is a purified, heat stable, lyophilised extract from the polysaccharide outer capsule of Neisseria meningitidis, effective against serogroup A and C organisms. Vaccine contains 50mcg each of the respective purified bacterial capsular polysaccharides. **There is no available vaccine effective against Group B organisms.**

23.2.2 A serological response is detected in more than 90% of recipients and occurs five to seven days after a single injection. The response is strictly Group specific and confers no protection against Group B organisms. Young infants respond less well than adults with little response to the Group C polysaccharide below 18 months and similar lack of response to Group A polysaccharide below three months. Vaccine induced immunity lasts approximately three to five years; in younger children a more rapid decline in antibody has been noted. Conjugated vaccines on the same lines as Hib vaccines are presently being investigated for suitability for infant use to protect against Group C meningococcal infections.

23.2.3 Vaccine must be stored at 2-8°C and the diluent must not be frozen. Vaccine should be reconstituted immediately before use with the diluent supplied by the manufacturer.

23.3 Route of administration and dosage

A single dose of 0.5ml is given by deep subcutaneous or intramuscular injection to adults and children from two months of age.

23.4 Recommendations

23.4.1 Routine immunisation with meningococcal vaccine is not recommended as the overall risk of meningococcal disease is very low, Group B organisms are the major cause of disease in the United Kingdom and a considerable number of cases of meningococcal disease from Group C organisms occur in children too young to be protected with presently available vaccines.

23.4.2 Asplenic children and adults, irrespective of age or the interval from splenectomy, should receive a single dose of meningococcal

vaccine before travelling to areas where there is an increased risk of Group A infection. Otherwise the vaccine should be restricted to groups for whom it is otherwise specifically recommended (see 23.4.3 to 23.4.5).

■ 23.4.3 **Contacts of cases:** Close contacts of cases of meningococcal meningitis have a considerably increased risk of developing the disease in the subsequent months, despite appropriate chemoprophylaxis. The recommended schedule for prophylaxis is rifampicin 600mg every 12 hours for **two** days in adults, 10mg/kg dose for children over one year of age and 5mg/kg for children less than one year. Ciprofloxacin as a single dose of 500mg is an alternative for adults but is not yet licensed in the UK for this purpose. Ceftriaxone 250mg intramuscularly can be given to pregnant contacts, but is not licensed in the UK for this purpose. Immediate family or close contacts of cases of Group A or Group C meningitis should be given meningococcal vaccine in addition to chemoprophylaxis. The latter should be given first and the decision to offer vaccine should be made when the results of typing are available. Vaccine should not be given to contacts of Group B cases.

■ 23.4.4 **Local Outbreaks:** In addition to sporadic cases, outbreaks of meningococcal infections with Group C organisms tend to occur in closed or semi-closed communities such as schools and military establishments. Immunisation has been shown to be effective in controlling epidemics, reducing infection rates but not carriage rates. Advice on the use of meningococcal vaccines is available from:

PHLS Communicable Disease Surveillance Centre
(0181-200 6868).

Public Health Laboratory Service
Meningococcal Reference Laboratory
(0161 445 2416).

Scottish Centre for Infection and Environmental Health
(0141 946 7120).

Scottish Meningococcal and Pneumococcal Reference Laboratory
(0141 201 3836).

Meningococcal vaccine has no part to play in the management of outbreaks of Group B meningococcal meningitis.

■ 23.4.5 **Travel:** In some areas of the world the risk of acquiring meningococcal infection is much higher than in this country particularly for those visitors who live or travel 'rough', such as backpackers, and those living or working with local people. Immunisation is recommended for longer visits (generally a month or more), especially if backpacking or living or working with local people, to:

(i) Sub-Saharan Africa:
Epidemics, mainly Group A infections, occur throughout tropical Africa particularly in the Savanna in the dry season which varies from country to country and can be unpredictable. More detailed country by country information is contained in the UK Health Departments' book 'Health Information for Overseas Travel'.

(ii) the area around Delhi, and Nepal, Bhutan and Pakistan.

(iii) Since 1988, following an outbreak of Group A meningococcal meningitis in 1987, Saudi Arabia has required immunisation of people coming to the Haj annual pilgrimage.

■ 23.4.6 Meningococcal vaccine may be given to HIV positive individuals in the absence of contraindications.

■ 23.5 Adverse Reactions

■ 23.5.1 Generalised reactions are rare although pyrexia occurs more frequently in young children than in adults.

■ 23.5.2 Injection site reactions occur in approximately 10% of recipients and last for approximately 24-48 hours.

■ 23.5.3 Serious reactions should be reported to the Committee on Safety of Medicines using the yellow card system

■ 23.6 Contraindications

■ 23.6.1 Immunisation should be postponed in individuals suffering from an acute febrile illness.

■ 23.6.2 Although there is no information to suggest that meningococcal vaccine is unsafe during pregnancy, it should only be given when this is unavoidable, ie. when there is true risk of disease. During an epidemic of meningococcal meningitis in Brazil, no adverse events were reported in pregnant women receiving vaccine.

■ 23.6.3 A severe reaction to a preceding dose of meningococcal vaccine is a contraindication to further doses.

■ 23.7 Supplies

The following meningococcal vaccines are licensed and available:

Mengivac (A+C), Pasteur Merieux MSD Ltd 01628 773200

AC Vax, SmithKline Beecham 0800 616482

■ 23.8 Bibliography

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