Meningococcal disease: a rare but devastating disease

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Meningococcal disease, although uncommon, is a serious and potentially life-threatening disease caused by *Neisseria meningitidis*. It commonly presents as meningitis or septicaemia. Early diagnosis and appropriate antibiotic treatment are crucial, as the disease can progress rapidly and can lead to death within hours. Meningococcal disease can occur in people of all ages, but certain people are at increased risk. It is important that people at high risk for meningococcal disease are vaccinated.

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Introduction

Meningococcal disease is a serious infection caused by *Neisseria meningitidis* bacteria (also known as meningococcus).[1-3] Based on the characteristics of their polysaccharide capsule (protective outer coat), meningococci are classified into 13 serogroups. Meningococcal disease is most commonly caused by six of these serogroups (A, B, C, W, X, and Y).[2,4,5]

Although meningococcal disease is uncommon, it occurs worldwide.[1] In South Africa, sporadic cases of meningococcal disease have been reported throughout the year, with most cases occurring from May to October.[4]

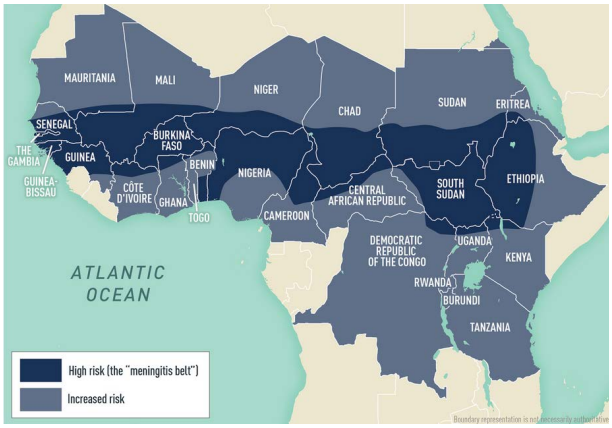
Outbreaks of meningococcal disease are most common in the "meningitis belt" of sub-Saharan Africa.[1,5] The meningitis belt stretches horizontally from Senegal in the west to Ethiopia in the east (see map).[5]

How is the infection spread?

At any given time, up to 10% of the population carry the bacteria in their nasopharynx (back of nose and throat) without it causing disease.[2,4,5,6] Asymptomatic carriers do not have any symptoms themselves, but are able to spread the bacteria to other people.[1,2,6,7] Asymptomatic carriage is temporary and varies over time. The incidence and length of carriage also varies in different populations, and age groups, with highest carriage rates occurring in adolescents.[2,4,5]

The bacteria are spread from person to person via respiratory droplets or throat secretions. People with meningococcal disease as well as asymptomatic carriers can be sources of infection.[2,4,5,7] The spread of the disease is facilitated by prolonged close contact with a carrier or infected person, for example, intimate kissing, sharing eating and drinking utensils, or living in the same household or close quarters such as a dormitory.[1,2,5,6]

The meningitis belt and other areas at risk for meningococcal meningitis epidemics



Map I. The meningitis belt and other areas at risk for meningococcal meningitis epidemics. Disease data source: World Health Organization, International Travel and Health (Geneva, Switzerland, 2015). CDC Health Information for International Travel 2024 (Yellow Book).[5]
Available from: https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/meningococcal-disease

Risk factors

People of all ages can acquire meningococcal disease.[7] However, it is more common in infants and in children under five years of age, adolescents and young adults (15 through 24 years of age) and adults over 80 years of age.[1,5,7]

Other risk factors for acquiring meningococcal disease are listed in Table I.

Signs and symptoms

Most people exposed to *N. meningitidis* carry the bacteria in the back of the throat, without becoming ill.[4,8] However, occasionally, "for reasons not fully understood, the bacteria

Table I: Risk factors for acquiring meningococcal disease[1,2,4-6]

Risk Factor	Examples
Certain medical conditions	People with: • Disorders of the immune system • Functional asplenia (no function or decreased function) or anatomic asplenia (no spleen) • Human immunodeficiency virus (HIV) infection
Close contact with a case	• Close or household contacts of a patient with meningococcal disease
Crowding or crowded living conditions	• New military recruits and adolescents or young adults entering their first year of university or college, especially those staying in dormitories/residences • Miners • Attendees of mass gatherings (i.e. Hajj pilgrims and travellers to Saudi Arabia, sporting events)
Settings/Occupational exposures	• Laboratory workers and microbiologists routinely exposed to *N. meningitidis* • People travelling to the meningitis belt with the risk being the greatest for unvaccinated long stay travellers who have close contact with the local population during an epidemic
Other	• Smoking or exposure to smokers (passive smoking) • Recent or current viral infections of the upper respiratory tract

Tabel II: Signs and symptoms of meningococcal meningitis and septicaemia[1,2,5,6]

Meningococcal meningitis	Meningococcal septicaemia
Classical symptoms include: • Sudden onset of fever • Headache • Stiff neck These symptoms may be accompanied by: • Nausea • Vomiting • Photophobia (increased sensitivity to light) and • Confusion (altered mental status) Meningococcal meningitis in newborns and infants may be difficult to notice as symptoms may be absent, or they may not present with the classic symptoms (see above). Instead, infants may: • Be irritable • Appear slow or inactive • Vomit • Feed poorly • Have a budging anterior fontanelle (soft spot on the scull)	Symptoms may include: • Sudden onset of fever • Fatigue • Nausea with or without vomiting • Diarrhoea • Cold hands and feet • Chills • Severe body pain • Rapid breathing • A petechial or purpuric rash (a dark purple rash). The rash does not fade with gentle pressure, and is characteristic of meningococcal disease, but it is not always present

overwhelm the body's defences", and cause a serious form of illness which can be deadly within a few hours. It is referred to as meningococcal disease, if the infection (caused by the *Neisseria meningitidis* bacteria) spreads through the bloodstream to the brain and other parts of the body.[4,6,8,9]

The two most common types of meningococcal infections are:[1,2,5,6]

- Meningococcal meningitis
  - Bacteria infect the meninges (membranes covering the brain and spinal cord) and cause swelling.
- Septicaemia (meningococcaemia)
  - Bacteria enter the bloodstream and start to multiply, causing damage to the walls of the blood vessels, which leads to bleeding into the skin and organs.

Table II summarises the signs and symptoms associated with meningococcal meningitis and septicaemia.

Complications

If not treated promptly, meningococcal disease can lead to serious complications such as deafness, brain damage, nervous system problems and disabilities (loss of a limb). Despite adequate antibiotic treatment, around 10–15% of people with meningococcal disease still die.[2,4,6,7]

Treatment

The onset of meningococcal disease is usually fast and initial symptoms may be non-specific (flu-like). The symptoms can worsen rapidly, and it can be potentially fatal within a matter of hours. Meningococcal disease is viewed as a medical emergency. It is imperative that antibiotic treatment is started as soon as possible, as the risk of serious illness, disability and death is high.[3,5,6]

If there is a high index of suspicion, the doctor will start empiric antibiotic treatment while waiting for identification of the causative organism. After the laboratory has identified

Table III: Key points on Menactra®[2,4,8]

Key points	Notes
Serogroup protection	• Protects against invasive disease caused by four serotypes, namely A, C, W and Y.
Indicated age groups	• Indicated for individuals from nine months of age through 55 years of age.
Scheduling status	• S4, which means that it is only available with a prescription.
Common side effects	• Local reactions (injection-site pain, swelling), fever and headache which typically clear within two to three days. • Other side effects include fatigue, malaise, irritability, drowsiness and loss of appetite.

the causative organism, the doctor will prescribe a suitable antibiotic based on the susceptibility of the causative organism.[5,6]

It is also important that all close contacts of an infected person are traced and given antibiotic prophylaxis. Firstly, the antibiotic will prevent them from developing illness, and secondly it will prevent them from spreading the disease.[1,3,5,6]

Vaccination

Meningococcal disease is a vaccine-preventable disease. There is no single vaccine available against all the serogroups that cause disease.[2] Some of the vaccines available internationally only protect against one serotype (monovalent A, B or C serotype), while other vaccines protect against a few of the disease-causing serotypes.[2,5] It is important to note that vaccines only protect against those serotype(s) of *Neisseria meningitidis* included in the vaccine.[2,5,6,8]

People at high risk of meningococcal disease, whether it is due to their age, underlying medical condition, travel or other risk factors should be vaccinated. However, anyone who wishes to reduce their risk of meningococcal disease may receive the vaccine (if not contraindicated).[2,4]

Menactra® is the only meningococcal vaccine currently available in South Africa.[4,8] (see Table III)

Vaccination against meningococcal disease is not part of the routine childhood immunisation programme in South Africa (Expanded Programme of Immunization in South Africa) offered by the Department of Health. It is only available with a prescription from a doctor and must be paid for either privately or by the medical aid.[4,6,8]

Conclusion

Although the risk for acquiring meningococcal disease in South Africa is low, the outcomes of acquiring meningococcal disease can be devastating.[4] Early symptoms are often non-specific.[2,4] It is important that people at high risk for acquiring meningococcal disease are vaccinated.[4]

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