Meningitis Disease Factsheet

What is meningitis?

Meningitis is an inflammation of the membranes covering the brain and spinal cord, called the meninges. It is caused when germs infect the cerebrospinal fluid (CSF), which circulates around the brain and spinal cord. The infection can be caused by three kinds of germs:

- **Viral** meningitis is the most common and least severe type. Almost all patients recover without any permanent damage, although full recovery might sometimes take many weeks.
- **Bacterial** meningitis is more aggressive and can lead to permanent damage or death. It is fatal in around 50 percent of cases if untreated, and accounts for around 170,000 deaths globally each year.
  - Most cases of bacterial meningitis are caused by meningococcus, pneumococcus, and Hib. These three bacteria are by far the most frequent causes of meningitis world-wide.
  - The meningococcus can be subdivided into distinct groups called serogroups, of which serogroups A, B, C, Y and W135 are responsible for over 95 percent of cases meningitis and septicaemia.
  - As with many infections, bacterial meningitis is much more frequent in the developing world than in developed countries. The major factors for the greater incidence of meningitis are poverty, overcrowding, and lack of access to vaccines.
- **Other causes of meningitis**, such as fungi, cause severe infections but occur much less frequently than viral or bacterial meningitis.

The serious and disabling after-effects of meningitis are well recognised and include hearing loss or deafness, learning difficulties, behaviour problems and developmental delay.

Septicaemia is caused when bacteria enter and then multiply rapidly in the bloodstream. This manifestation of the infection may be seen alone or in addition to meningitis.

What are the symptoms?*

Meningitis is not easy to recognise in the early stages and the symptoms can be similar to those of the common flu. The main symptoms to look out for are fever, vomiting, headache, stiff neck, sensitivity to light, and drowsiness. The signs and symptoms do not appear in a definite order and some may not appear at all. Early signs indicating that meningitis may be complicated by septicemia include muscle aches and pain, especially leg pain, cold hands and feet, pallor or skin mottling.

Urgency to treat meningitis

Meningitis can develop quickly, over a matter of hours. Until the cause of meningitis has been established, it should be regarded as a medical emergency requiring prompt diagnosis and urgent treatment.

If signs of septicaemia are present, treatment should be started as soon as possible and diagnostic tests deferred until antibiotics have been given.

How is meningitis transmitted?

Depending on the type of meningitis, the transmission can vary. For bacterial meningitis, infection spreads from person to person by direct contact with secretions from the nose and throat, which contain the bacteria. Spread
from a carrier to another person requires close, direct physical contact, combined with activities such as kissing, coughing, and sneezing, which result in production of large numbers of droplets which can be contaminated with bacteria. The carrier state is very common – it is believed that 10-20 percent of the population carries the germs, which can cause bacterial meningitis in their nose and throat at any given time – but meningitis bacteria cause disease only in susceptible persons.

For viral meningitis, this is spread most often through faecal contamination or through secretions from the nose or throat of an infected person.

For fungal meningitis, transmission is not from person to person. It is not contagious, but rather spread by inhaling fungal spores from the environment.

**Who is most at risk from meningitis?**

While meningitis can affect people of all ages, infants, children and adolescents are typically at an increased risk of infection. The peak infant age group at risk of bacterial meningitis is six to 18 months of age. Overall about 50 percent of cases of bacterial meningitis occur in children under the age of five years old, and there is a second disease peak in adolescents and young adults 15-24 years of age. Viral meningitis occurs in all age groups, but is most common in children.

Those people with diseases or conditions which affect the immune system are at increased risk of viral and fungal meningitis. With the decline of immune function in the elderly as the result of aging and the increase in diseases affecting the immune system, the incidence of meningitis is increased in this group.

**How is meningitis prevented?**

The best means of preventing bacterial meningitis is through vaccination. Vaccines are available to prevent most, but not all, bacteria causing bacterial meningitis in children, adolescents, and young adults. Additional vaccines are being developed to prevent against other common strains.

Vaccines are given to prepare the immune system before exposure to a germ so that it is better able to fight an infection when it occurs. Vaccines contain either parts of a germ, live but weakened germs, or inactivated (dead) germs. Germs contain very specific proteins and sugars (called polysaccharides) on their surfaces that are called antigens.

All of the current vaccines against bacterial meningitis are composed of purified polysaccharides and/or proteins derived from the meningitis germs. The antigens stimulate the immune system to produce protective proteins (antibodies) and immune cells (lymphocytes).

When the vaccine is given, the immune system reacts as if the germ has entered the body. It produces specific antibodies and lymphocytes responsible for immunity against the germ. When a vaccinated person is subsequently exposed to the germ, the immune system is able to recognise the germ right away and eliminate it before it can cause harm. Some vaccines may need to be given more than once in order to establish adequate immunity.

Before a vaccine can be approved for use, it must be thoroughly tested for safety and effectiveness. All of the vaccines now available to prevent meningitis have been used for several years in some countries, and millions of doses have been administered.
For viral and fungal meningitis, there are no vaccines to prevent infection; however some childhood vaccines (MMR and chickenpox) can help to protect children against some diseases that can lead to viral meningitis. Other prevention methods for viral meningitis include washing hands thoroughly, keeping surfaces clean, and avoiding situations where secretions from other people may be shared (e.g. kissing, sharing a drinking glass, etc). For fungal meningitis, it is best to avoid exposure to environments likely to contain fungal elements (e.g. bird droppings and dust).

* The signs and symptoms of meningitis provided do not include every possible sign and symptom. They do not appear in a particular order and some symptoms described may not occur at all. Please consult your local healthcare professional for further information.

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References

- CoMO. Available at: http://comoonline.org
- CDC. Meningitis. Available at: http://www.cdc.gov/meningitis/about/index.html