Neonatal meningitis, the facts

This fact sheet provides information about the most common causes of neonatal meningitis and answers some frequently asked questions. Information about other types of meningitis that can affect newborn and very young babies can be found on our other factsheets at www.MeningitisNow.org. You can also request any of our information materials by contacting our Meningitis Helpline on 0808 80 10 388.

Words highlighted in blue are explained in a glossary on the back page.

Meningitis is inflammation of the membranes that surround the brain and spinal cord. These membranes are called the meninges – they help protect the brain from injury and infection.

Septicaemia is a severe infection of the blood. Bacteria multiply in the blood, releasing toxins that cause widespread damage to the body.

What is neonatal meningitis?

Neonatal meningitis is the term used to describe meningitis that occurs in the first 28 days of life. Many different organisms can cause neonatal meningitis, broadly grouped as bacteria, viruses and fungi. However, the most common causes are bacteria; in particular group B streptococcus (GBS) and Escherichia coli (E. coli).

GBS bacteria live harmlessly in the vagina and intestinal tract of approximately 10 to 30% of women. These bacteria can sometimes be passed to the baby during delivery. The result is usually colonisation of the skin surfaces and only a small percentage of babies go on to become ill with serious infection. When a baby becomes ill in the first six days of life this is called early onset disease. When a baby becomes ill between seven and 28 days after birth this is called late onset disease. Rarely, infection may occur as late as three months of age.

E. coli are common bacteria found in the large intestine of nearly all healthy people and, like GBS, may be passed to a baby during delivery. Although most strains of E. coli do not cause disease, serious infections may occur if the bacteria invade areas of the body in which they are not normally found, such as the urinary tract, blood stream, or meninges.

Another rare cause of neonatal meningitis is Listeria monocytogenes. Generally acquired as a food-borne infection, these bacteria may cause a flu-like illness with diarrhoea in a pregnant woman, but may also be passed to the baby in the womb across the placenta. Infection may cause premature labour, and the baby will usually be unwell from the time of birth, although late onset disease is also recognised.

Very few cases of Listeria meningitis now occur each year in the UK. This is as a result of successful education campaigns warning about the dangers of eating unpasteurised soft cheeses, pâté and other foods that might harbour Listeria bacteria during pregnancy.

GBS, E. coli and Listeria bacteria can cause both meningitis and septicaemia, which can either occur separately or together.

Key points

- Neonatal meningitis occurs in the first 28 days of life
- Many different organisms can cause neonatal meningitis.
- There are approximately 300 cases of neonatal bacterial meningitis each year in the UK
- Urgent treatment with antibiotics is vital
Can neonatal meningitis be prevented?

Currently there are no vaccines available to protect against group B streptococcus, *E. coli* or *Listeria* infections.

There are many factors affecting whether or not a newborn develops meningitis. Adopting good hygiene practices is important as this may help to reduce the risk of neonatal meningitis.

In the UK there is no national screening programme to routinely check all pregnant women to see if they carry GBS bacteria in their vagina during pregnancy. The procedure can be requested, but is not standard practice. However, a risk based strategy is widely used and antibiotics, known as ‘intrapartum antibiotic prophylaxis’ (IAP), may be offered during labour/delivery to women who are considered ‘at risk’. A pregnant woman is considered to be ‘at risk’ if:

- during pregnancy GBS bacteria have been found in the urine, or on a swab from the vagina and/or rectum taken for some other reason
- she has previously had a baby with GBS infection
- she has a high temperature during labour or premature labour (before 37 weeks)
- labour continues for more than 18 hours after the waters have broken

There is national guidance for maternity staff on how to manage women in these groups and their babies. Any baby born to an “at risk” mother will be closely monitored for signs of infection.

How does a baby develop meningitis?

Occasionally, bacteria overcome the body’s defences and cause infection. In this process the bacteria may spread through the bloodstream to the meninges and cause meningitis. When the bacteria infect the meninges, tiny blood vessels in the membranes are damaged. This allows the bacteria to break through and infect the cerebrospinal fluid (CSF). The meninges then become inflamed, increasing pressure around the brain which can cause nerve damage and specific symptoms associated with meningitis.

Infection in the bloodstream can itself be life-threatening. The bacteria multiply rapidly, doubling in number around every 30 minutes, causing sepsis. As the bacteria multiply, they begin to release toxins. The body’s natural defences have little effect on these poisons. As sepsis advances, it affects the whole body and can cause organ damage or failure.

The signs and symptoms of meningitis or sepsis are often non-specific at first and can be difficult to recognise in very young babies. Therefore it is important to trust your instincts as a parent/carer and seek medical attention urgently if you suspect your child is ill. Some common signs and symptoms are listed below. They can appear in any order and some may not appear at all.

- Fever (with cold hands and feet)
- Reluctance to feed
- Vomiting and/or diarrhoea
- Irritability/dislike being handled
- Floppy/difficult to wake/unresponsive
- Difficulties breathing or grunting
- Faster or slower than normal breathing rate
- Pale/blotchy skin
- Red/purple spots/rash do not fade under pressure
- High pitched cry/moaning/whimpering
- Bulging fontanelle (soft spot)
- Convulsions/seizures
- Arched back
- Swollen abdomen
- Dry nappies

How is neonatal meningitis treated?

In hospital, various tests can be carried out to establish the type of meningitis and treatment is started accordingly. One of the main investigations carried out to test if a baby has meningitis is a lumbar puncture. This allows the doctor to quickly make a diagnosis of meningitis by analysing the CSF that bathes the meninges. This fluid becomes infected when a baby has meningitis.
Urgent treatment with antibiotics is vital. Sometimes treatment with antibiotics is started because the baby’s condition is too serious for a lumbar puncture to be performed. In these cases the lumbar puncture can be done when the baby’s condition has improved or stabilised. The duration of antibiotic treatment will vary depending on the type of bacteria that has caused the meningitis.

If a baby is seriously ill, specialist care in an intensive care unit will be required. Here the doctors and nurses can closely monitor the baby’s condition, respond to emergencies and provide immediate support when it is needed. Appropriate hospital care and treatment are essential if the baby is to make a good recovery.

What happens when there is a case?

Cases of neonatal meningitis caused by GBS, E. coli and Listeria are reportable to public health, but are not considered to be contagious. Therefore, close contact with a baby who has the illness poses no increased risk of infection. There is little chance of a second related case occurring. If meningitis and septicaemia are caused by other bacteria, the public health team may need to take action by tracing close contacts to reduce the slight risk of further, related cases.

What happens after neonatal meningitis?

Many babies will make a good recovery. However, up to 50% of babies who have neonatal meningitis may be left with after-effects.

The after-effects of meningitis are usually the result of damage to various areas of the brain, including the nerves responsible for hearing and sight. Serious and disabling after-effects are well recognised and include hearing loss or deafness, loss of vision or blindness, epilepsy, severe brain damage, speech problems.

After-effects and complications of septicaemia occur as a result of damage to the major organs of the body such as the brain, kidneys, lungs, heart and skin. The toxins damage blood vessels and stop the vital flow of blood to the organs including the skin and underlying tissues.

After-effects of meningitis or septicaemia may be complicated and can require ongoing support (for life) from a wide range of health professionals and organisations. In many cases the after-effects will be helped by various therapies, for example, physiotherapy and occupational therapy.

Other babies will experience one or more of a wide range of less debilitating, but still serious, after-effects. These can be temporary or permanent and include memory loss, anxiety, depression, headaches, learning difficulties and behaviour problems. Some after-effects may not be apparent until the child is older, so it is important for these babies to have regular follow-up and assessment.

A journal is available to record a child’s experience of meningitis and septicaemia, and offers detailed information about follow-up, recovery, after-effects and support.

To request a copy or find out more about after-effects and support Meningitis Now can offer go to www.MeningitisNow.org or call our helpline.

Tragically some babies will die, despite receiving the best possible treatment and care. The death of a baby following meningitis or septicaemia can be traumatic, distressing and painful. If your baby has died following meningitis or septicaemia, our helpline staff are there to listen, and can explain the different ways we are able to offer help and support.

Find out more

- **Meningitis Now**
  www.MeningitisNow.org
  Information about meningitis and the work of Meningitis Now.

- **NHS immunisation information**
  www.nhs.uk
  Information about vaccination from NHS Choices.

- **Group B Strep Support**
  www.gbss.org.uk
  UK charity which provides information and support to those affected by GBS. Also provides information for health professionals.

- **Royal College of Obstetricians and Gynaecologists**
  www.rcog.org.uk
  For information about the screening programme for GBS.
Meningitis Now is the UK's largest meningitis charity and is here to help you, when you need us and for as long as you need us. We are saving lives and rebuilding futures through awareness, research and support.

We offer on-going support for all those living with the impact of the disease. We support individuals, and their families, including those who have been bereaved, helping to rebuild lives after meningitis and septicaemia.

We can:

- Listen; and answer your questions about meningitis and septicaemia
- Talk to you about your individual experience and how we can tailor our help to you
- Visit you in your own home and provide support locally to you
- Put you in touch with others who have been through it too
- Support you and those closest to you; children, teenagers and adults

If you have any questions, or are interested in finding out how we can help, please get in touch.

Meningitis Helpline: 0808 80 10 388 (UK)

Email: helpline@meningitisnow.org

We are proud of the work we do, but we can’t do it alone. We rely on voluntary donations and need help from people like you. Every penny, pound, hour and day given makes a big difference. Find out how you can help www.MeningitisNow.org

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References for the content of this fact sheet are available on our website.