

Sepsis Neonatorum

Sepsis in a newborn (*sepsis neonatorum*) is an infection that spreads throughout the baby's body. Sepsis occurs in less than 1 percent of newborns (1 out of every 100), but accounts for up to 30 percent of deaths in the first few weeks of life. Infection is 5-10 times more common in premature newborns and in babies weighing less than 5½ pounds than in normal-weight, full-term newborns. Complications experienced during birth, such as premature or prolonged rupture of the membranes or infection in the mother, put the newborn at increased risk of infection.

Symptoms

The onset of what is called early-onset neonatal sepsis is within six hours of birth in over half the cases and within 72 hours in the great majority of cases. Sepsis that begins four or more days after birth is called late-onset sepsis, and is probably an infection acquired in the hospital nursery (a nosocomial infection). In both types of neonatal sepsis, the infection may be only in the bloodstream, or may spread to the lungs (pneumonia), brain (meningitis), bone (osteomyelitis), joints, or other organs in the body.

Typical symptoms of a newborn with sepsis include:

- listlessness (a very sleepy baby)
- feeding problems
- a high OR low temperature

Other symptoms include:

- difficulty breathing, rapid breathing, or apnea (when the baby stops breathing)
- seizures
- excessive jitteriness
- repeated vomiting or diarrhea
- a swollen abdomen

Diagnosis

The organism that is causing the infection may be identified by taking cultures of the blood as well as from other sites of the body. Urine samples are often cultured for bacteria to look for an infection in the urinary tract. Because only small samples of blood and other body fluids are taken, sometimes no organism is found. However, the infant may still be treated if other laboratory studies or the infant's clinical appearance strongly suggest an infection.

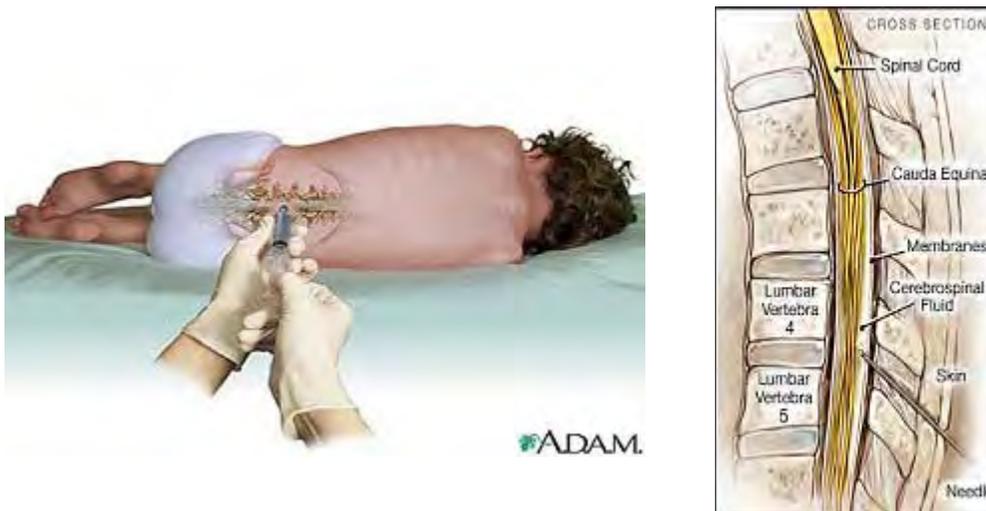
Other laboratory studies that doctors use to detect an infection include the following:

- **White Blood Cell Count and Differential:** When an infant is fighting an infection, their white blood cell count may either go up, as the infant's body produces more infection-fighting cells, or it might also go down if the infant has used up all of their white blood cells fighting the infection and can no longer keep up with their production of white cells. Another change that is seen when an infant is fighting an infection is an increase in the percentage of immature white cells. This is due to the increased production rate of white blood cells, such that more immature white blood cells are being released into the blood stream. This higher percentage of immature white cells is sometimes referred to as a

"left-shift," and is one of the things that can tell the doctors that the infant has an infection.

- **C-Reactive Protein (CRP):** This is a laboratory test that measures a protein that is a non-specific marker for inflammation and therefore infection. If the infant has two normal CRP levels measured 24 hours apart, then there is a 99% chance that the infant does not have an infection. Therefore, this test is most useful in ruling out an infection.
- **Lumbar Puncture:** If the doctor suspects meningitis, which is more common if something has grown in the baby's blood culture, a spinal tap, or lumbar puncture will be performed. Lumbar punctures allow the doctor to obtain a small amount of cerebrospinal fluid (CSF), which is the protective fluid that surrounds the brain and the spinal cord. The CSF can then be cultured to determine if the bacteria has spread to the nervous system.

The doctor, nurse practitioner, or physician's assistant will very carefully insert a special spinal needle between two vertebrae, or backbones, in the baby's back at a level below where the actual spinal cord ends, so there is no danger that the needle will come into contact with the baby's spinal cord. After a very small amount of fluid is removed, the needle is taken out, and a band-aid placed on the baby's back.



The spinal needle is inserted (left) below where the spinal cord ends (right.)

Prognosis and Treatment

Sepsis in a newborn is treated with antibiotics given intravenously. Antibiotics are often started even before laboratory and culture results are available. The doctor may then switch to a different antibiotic that is more specific to the baby's infection once the results of laboratory tests are back. The length of antibiotic treatment varies depending on the infant's clinical status, laboratory test results, and kind of infection. If blood cultures and other laboratory tests are all negative, antibiotics may be stopped after 48 hours of treatment. If the infant's cultures are positive, or if the laboratory tests and clinical status are suggestive of infection, the infant will be treated with antibiotics, usually anywhere from 7-14 days. When appropriately treated with antibiotics and cared for in the intensive care unit, the great majority of newborns with sepsis live without any long-term problems.