

Neonatal Jaundice

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What is neonatal jaundice?

Neonatal jaundice (jaundice in the newborn period) is a condition in which an infant's skin appears yellow within the first month of life after birth due to the accumulation of a yellow pigment called bilirubin in the skin. Neonatal jaundice occurs in about 2/3 of all healthy newborns.

Where does Bilirubin come from?

Bilirubin is produced when red blood cells break down as part of a normal process. Newborn babies make more bilirubin in the 1st month of life than older infants and children.

How do you know if a baby has jaundice?

The baby's skin usually appears yellow starting from the head and then slowly the jaundice spreads toward the feet. It usually starts on the 1st or 2nd day of life. It usually reaches its peak when the baby is 3 to 4 days old and then slowly gets better. When the jaundice follows this normal pattern, this is called "physiologic" or normal neonatal jaundice.

What if the jaundice appears earlier or later?

Occasionally, jaundice will either appear very early on, for example before the baby is 24 hours old, or will increase dramatically on the second or the third day to a very high level. If that occurs, blood testing may need to be done to determine if the baby's bilirubin level is abnormal and if so what may be causing the increase.



What tests are performed to find out why the baby is jaundiced?

If the doctor is concerned about the level of jaundice a blood test called a serum bilirubin level is performed.

Other tests may be used to determine the bilirubin level. A transcutaneous (through the skin) test is sometimes done in certain hospitals. This test is less accurate and may need to be confirmed with blood testing.

Other blood or x-ray tests may need to be performed if the bilirubin level is very high.

What causes neonatal jaundice?

Neonatal jaundice is usually a normal condition resulting from the destruction of old red blood cells. After red blood cells are broken down, bilirubin is made. Bilirubin is the pigment that causes jaundice. One of the jobs of the liver is to clear bilirubin from the body. The liver of a baby in the first 1-2 weeks of life is immature and may not be able to handle disposal of all the bilirubin made. The extra bilirubin will then be deposited in the skin, causing the skin to look yellow. Other factors such as poor feeding (decreased breast feeding or formula volume or frequency), if the baby is underweight, diabetes in the mother, or drugs may also cause an increased bilirubin level.

What if the bilirubin continues to increase and my baby is very yellow?

Under certain circumstances, the baby's jaundice may become worse. Reasons for this happening include:

1. **Increased production of bilirubin:** In certain diseases, the red blood cells of the baby are destroyed at a faster rate than normal. These diseases are usually identified through testing done by the obstetrician prior to or at the time of the baby's birth. An example of such a disease is when the baby's and mother's blood types are different and not compatible. When this occurs the mother's immune system reacts and will form antibodies that attack the baby's red blood cells. Babies who have this may also be anemic (low number of red blood cells).
2. **Birth trauma:** Sometimes the baby may have a very large bruise over the scalp or the head. This can happen when vacuum extractors or forceps are used to deliver the baby. After birth this very large bruise will be re-absorbed and the old blood from the bruise will break down to make more bilirubin, which needs to be cleared by the liver.
3. **Infection:** Babies with infections may not be able to process bilirubin normally resulting in increased levels. This can occur with infections in the urine, blood, liver or other organs.



4. Problems with bilirubin metabolism: In very rare cases the baby's liver is not able to change the bilirubin into a form that can easily be removed from the body. This occurs in a disease called Crigler-Najjar syndrome.
5. Problems with digesting galactose: Babies who cannot normally break down the sugar in breast milk (lactose) or in some formulas that contain cow's milk may have a disease called galactosemia. This disease can present with jaundice in the newborn period and is associated with other severe symptoms (such as lethargy, vomiting, irritability and possibly convulsions). Galactosemia is often detected by a blood test (heel prick) before discharge from the nursery as part of the mandatory state screening for newborn diseases. Galactosemia is treated with strict dietary avoidance of galactose. This is not the same as being lactose intolerant and the two conditions should not be confused.

How can my doctor know whether the jaundice is normal versus abnormal?

Your doctor will order a blood test that will measure the different types of Bilirubin. These types are:

1. Indirect bilirubin: This is the type that is usually increased in infants with neonatal jaundice and in patients who have increased destruction of red blood cells.
2. Direct bilirubin: this is the type that is usually associated with liver disease. Liver disease is diagnosed with additional blood tests, sometimes x-ray tests or other procedures and sometimes by taking a small sample of liver tissue called a liver biopsy.

What are some of the symptoms when a baby has an increase in direct bilirubin?

The symptoms can be the same or different from those of normal neonatal jaundice. Babies can be very irritable, fussy, and may have fever or they can have no symptoms. In addition to blood work to look for blood or urine infections, other testing may be performed. A specialist in liver disease in children, a pediatric gastroenterologist, may be called in consultation to help sort out the diagnosis.

How is the neonatal jaundice treated?

The treatment varies based on the cause of the jaundice and the bilirubin level. Usually in normal neonatal jaundice, the process will be self-limiting and the baby does not need to be treated. The baby may be able to be discharged home within 48 hours of life without problems. The baby will need to be followed up by the pediatrician to ensure that the bilirubin level is going down.



If the bilirubin level remains high or is increasing, the baby may need treatment to decrease the Bilirubin level. Treatments might include:

1. Holding breast-feeding temporarily.
2. Phototherapy.
3. Exchange transfusions.

Why would breast-feeding be held if my baby is jaundiced?

Some babies have a significant increase in the unconjugated bilirubin levels due to breast-feeding. Holding breast feeding and supplementing with infant formula for 48 hours may in some cases decrease the bilirubin in babies with “breast milk jaundice”. Families should speak with their physician to determine if this is required and for instructions on how to proceed.

What is phototherapy?

Phototherapy is a treatment that allows the bilirubin under the skin to be broken down by a special light that illuminates the baby’s body. These lights are usually blue-green. They are placed about 4 inches above the baby. The more skin that is exposed to the lights the better they work to break down bilirubin. The lights do not prevent the baby from eating and/or from drinking formula or being breast-fed. The baby can be safely removed from the phototherapy for feeding without harming the treatment.

Can phototherapy be performed at home?

As long as the level of bilirubin is not very high, the phototherapy treatment can be done at home with a special blanket called a “bili” blanket. The physicians will then arrange for blood tests to be done regularly to ensure that the treatment is working.

Why are babies treated for jaundice or increased bilirubin levels?

In some cases the level of the indirect bilirubin can go very high. Doctors are concerned if the bilirubin levels are more than 20-25 mg/dL (deciliter). When it goes above 25 mg/dl, there is a risk that bilirubin can cause irritation in some areas of the brain. If this lasts, the baby may develop a change in how he or she behaves and develops. This is called acute encephalopathy (inflammation of the brain). If the bilirubin remains very high, above 25 mg/dl, babies can be at risk for significant brain damage. This condition is called kernicterus. Kernicterus is very rare. When bilirubin levels are very high, babies may be treated with a special type of blood transfusion called an exchange transfusion in order to prevent kernicterus and other complications.



What are the risks of phototherapy?

There are generally no significant risks with phototherapy. Usually, the eyes of the baby will have patches to prevent the light from harming the baby's eyes and retina. There are no risks to the genitals of the baby. Babies require adequate fluid when they are undergoing phototherapy.

What is an exchange transfusion?

An exchange transfusion is a treatment that is done in the Neonatal intensive care unit. The baby's blood is exchanged very slowly and carefully with a donor's blood. This is done for babies with very high bilirubin levels. This allows for the bilirubin to be removed faster, which will decrease the risk of further complications. This treatment is reserved for the most serious cases at risk for developing kernicterus.

