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Newborn Jaundice

All babies become jaundiced in the first few days after birth. Usually, the infant remains healthy, or at worst becomes a bit sleepy for a couple of days. But occasionally the jaundice can become a concern.

Why do babies develop jaundice?

Jaundice develops from red blood cells (RBCs) breaking down. While in the womb, an infant receives oxygen from the mother's blood, through the placenta and the umbilical vessels. Extracting oxygen from the mother's blood in the placenta turns out to be difficult, so the infant requires a relatively high blood count. But after birth, the lungs inflate and the baby breathes air directly, so the high blood count is no longer needed. Some of the newborn's RBCs start to break down. This releases hemoglobin into the bloodstream, which carries it to the liver. Then the baby's liver makes a series of chemical changes to the hemoglobin molecule, ultimately turning it into a bile salt which can be excreted into the intestinal tract, and eliminated.

But unfortunately, the baby's liver is sometimes not quite ready for the sudden load of hemoglobin molecules. The baby's liver has been accustomed to the mother's liver doing most of the work! So, the intermediate products of hemoglobin breakdown tend to accumulate. One of these breakdown products, "bilirubin", has a yellow color, which makes the baby look yellow (hence the term, "jaundice"). At higher levels, it can also make the baby sleepy or have other neurologic effects.

What makes newborn jaundice worse?

If the liver is not working properly, bilirubin accumulates because it cannot be metabolized or excreted as quickly. This can happen with infection, prematurity, and congenital liver problems.

If RBCs break down more quickly than usual, the infant's liver can't fully metabolize all the hemoglobin as rapidly. So bilirubin accumulates, causing jaundice. This can happen with infection, with inherited problems with the baby's red blood cell membrane, or with metabolic problems inside the red blood cell such as G6PD.

Jaundice seems to run in families. We may evaluate or treat an infant earlier if an older sibling or parent required treatment for jaundice as a newborn.

Breastfed babies are somewhat more prone to jaundice than formula fed babies. Partly this is due to the milk taking a few days to "come in." But there seems to be a molecule in breast milk, not found in formula, that prolongs jaundice for several days or weeks. This does not seem to hurt the babies, and usually it's not a reason to stop or reduce breastfeeding. But don't be surprised if a breastfed infant remains a bit jaundiced, sometimes for a couple of weeks.

When does jaundice require treatment?

For full-term babies who are otherwise healthy, there are charts (similar to a growth curve) that show how bilirubin levels may trend, according to the baby's age in days. Babies born in hospitals usually are tested before discharge with a skin measurement called "transcutaneous bilirubin." If this number is high, it may be confirmed with a blood test.

Pre-term infants, or infants who are otherwise sick or losing weight, may need more aggressive treatment.

Unfortunately, visually estimating the degree of jaundice may be inaccurate. In particular, jaundice used to be evaluated according to the "level" of the jaundice (starting on the face, extending down to the chest as it worsened, etc.). But there is no physiologic basis for this estimation, and it is often misleading.

Why does jaundice require treatment?

There are two risks to jaundice. The common risk is that the baby will become so sleepy that it won't nurse. The baby may become dehydrated, and a nursing mother may not develop adequate supplies of breast milk.

A less common, but more serious risk, is a type of brain damage called "kernicterus." Hearing loss, learning disabilities, or a type of cerebral palsy may result. Typically, this may develop with bilirubin levels over 25 or 30.

How is jaundice treated?

Jaundice can be treated in two ways. Extra feedings help push the bilirubin through the intestines, so that it won't be reabsorbed. (Breastfed infants may be given supplements of formula or expressed breast milk, 1-2 ounces after every 2nd or 3rd nursing.) This also keeps the baby strong enough to suckle and stimulate milk production.

Additionally, light of a special blue wavelength can be shone on the baby's skin. The bilirubin molecules in the skin absorb the energy of the light wave, changing its shape to become more water soluble, so that the kidneys can excrete it into the urine. This supplements the liver's excretion into the intestine.

This phototherapy can often be done at home. A box with a special light inside plugs into the wall; then a 4-foot fiberoptic cable conducts the light (but not the heat) from the bulb to a small blanket, which glows. The blanket is kept against the infant's skin. The infant can be held and fed while on the blanket. I suggest that the blanket be used for about 20 hours

each day, which allows 4 hours for changing, bathing, and short walks. Usually, phototherapy is needed only for a few days. Hospitalization is required if the home equipment is not available, or if the bilirubin level is too high or is not responding to home treatment.

Your health insurance usually covers the cost of phototherapy at home. Also, a Visiting Nurse may visit your baby each day while on home phototherapy, to check the weight and check the bilirubin level.

Extra water is no longer advised for jaundiced babies. It has been shown to make no improvement in the jaundice, and it might make the baby less hungry for formula supplements (which do work).

Keeping the baby by the window, while often recommended, does not seem to be very effective. The strength of sunlight varies according to the weather and the season. Also, we suspect that the insulation and UV coatings on modern window glass may inadvertently block the frequency of light that treats jaundice.

What happens after the jaundice resolves?

A day or two after the phototherapy has been stopped, we order one final blood test to ensure that the bilirubin has not "rebounded" higher. (If it does, this may indicate a deeper problem that requires diagnosis, but this is unusual.)

At this point, it is also ok to stop supplementing with formula. We continue to watch the baby's weight gain closely. But usually, once the jaundice has subsided, there are no long term effects, and the baby recovers fully.