

Clinical Evidence Handbook

A Publication of BMJ Publishing Group

Neonatal Jaundice

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About 50 percent of term and 80 percent of preterm newborns develop jaundice, which usually appears two to four days after birth, and resolves spontaneously after one to two weeks.

- Jaundice is caused by bilirubin deposition in the skin. Most jaundice in newborns is a result of increased red blood cell breakdown and decreased bilirubin excretion.
- Breastfeeding, hemolysis, and some metabolic and genetic disorders also increase the risk of jaundice.
- Unconjugated bilirubin can be neurotoxic, causing an acute or chronic encephalopathy that may result in cerebral palsy, hearing loss, and seizures.

Phototherapy provided by conventional or fiber-optic lights in the hospital reduces neonatal jaundice compared with no treatment (as assessed by serum bilirubin levels).

- Compared with high-threshold phototherapy, low-threshold phototherapy reduces neurodevelopmental impairment and hearing loss, and reduces serum bilirubin on day 5 in extremely low-birth-weight infants. However, it increases the duration of phototherapy, and there is no effect on mortality or the rate of exchange transfusion.

- Close light-source phototherapy compared with distant light-source phototherapy reduces the duration of phototherapy in infants with hyperbilirubinemia.

We do not know whether home phototherapy is more or less effective than hospital phototherapy as we found no studies comparing the two treatments.

There is consensus that exchange transfusion reduces serum bilirubin levels and prevents neurodevelopmental sequelae, although we found no studies to confirm this.

- Exchange transfusion has an estimated mortality of three or four per 1,000 infants,

and 5 to 10 percent of survivors have permanent sequelae.

We do not know whether albumin infusion is beneficial.

Tin-mesoporphyrin is not currently licensed for routine clinical use in the United Kingdom or the United States, and further long-term studies are warranted to confirm its place in clinical practice.

However, tin-mesoporphyrin reduced the need for phototherapy (as assessed by serum bilirubin levels) when given to preterm infants on the first day of life, or to term or near-term infants within the first few days of life.

Intravenous immunoglobulin reduces the need for exchange transfusion in high-risk infants with hemolytic hyperbilirubinemia, as well as reduces serum bilirubin levels, the requirement for phototherapy, and the length of hospital stay.

- Benefits of immunoglobulin were observed when used alone or in conjunction with phototherapy. No adverse effects were reported. However, we do not know whether immunoglobulin prevents neurodevelopmental sequelae.

Definition

Neonatal jaundice refers to the yellow coloration of the skin and sclera in newborns that results from hyperbilirubinemia.

Incidence and Prevalence

Jaundice is the most common condition requiring medical attention in newborns. About 50 percent of term and 80 percent of preterm newborns develop jaundice in the first week of life. Jaundice is also a common reason for readmitting a newborn to the hospital after early discharge. Jaundice usually appears two to four days after birth and disappears one to two weeks later, usually without the need for treatment.

Etiology and Risk Factors

Jaundice occurs when there is accumulation of bilirubin in the skin and mucous membranes. In most infants with jaundice, there is no underlying disease, and the jaundice is termed physiologic. Physiologic jaundice typically presents on the second or third day of life, and results from the increased production of bilirubin (owing to increased circulating red blood cell mass and a shortened red blood cell lifespan) and the decreased excretion of bilirubin (owing to low concentrations of the hepatocyte binding protein, low activity of glucuronosyl transferase, and increased enterohepatic circulation) that normally occur in newborns.

Breastfed newborns are more likely to develop jaundice within the first week of life; this is thought to be an exacerbated physiologic jaundice caused by lower caloric intake and increased enterohepatic circulation of bilirubin. Prolonged unconjugated jaundice, persisting beyond the second week, is also seen in breastfed infants. The mechanism for this later “breast milk jaundice syndrome” is still not completely understood. Nonphysiologic causes include blood group incompatibility (rhesus or ABO problems), other causes of hemolysis, sepsis, bruising, and metabolic disorders. Gilbert and Crigler-Najjar syndromes are rare causes of neonatal jaundice.

Diagnosis

Jaundice is usually seen first in the face, and progresses caudally to the trunk and extremities. However, visual estimation of the bilirubin levels can lead to errors, and a low threshold should exist for measuring serum bilirubin. There are devices that measure transcutaneous bilirubin, but these are generally for screening purposes.

Prognosis

In newborns, unconjugated bilirubin can penetrate the blood-brain barrier and is

Clinical Question

What are the effects of treatments for unconjugated hyperbilirubinemia in term and preterm infants?

Beneficial	Hospital phototherapy Immunoglobulin (in high-risk infants with hemolytic hyperbilirubinemia)
Likely to be beneficial	Exchange transfusion*
Unknown effectiveness	Albumin infusion Home vs. hospital phototherapy Tin-mesoporphyrin

*—Although we found no randomized controlled trials comparing exchange transfusion with no active treatment, there is general consensus that exchange transfusion is effective at reducing serum bilirubin levels.

potentially neurotoxic. Acute bilirubin encephalopathy consists of initial lethargy and hypotonia, followed by hypertonia (retrocollis and opisthotonus), irritability, apnea, and seizures. Kernicterus refers to the yellow staining of the deep nuclei of the brain—namely, the basal ganglia (globus pallidus). However, the term is also used to describe the chronic form of bilirubin encephalopathy, which includes symptoms such as athetoid cerebral palsy, hearing loss, failure of upward gaze, and dental enamel dysplasia. The exact level of bilirubin that is neurotoxic is unclear, and kernicterus has been reported at autopsy in infants in the absence of markedly elevated levels of bilirubin. Reports suggest a resurgence of kernicterus in countries in which this complication had virtually disappeared. This has been attributed mainly to early discharge of newborns from the hospital.

The authors thank David Evans, the previous contributor of this review.

SEARCH DATE: February 2010.

Author disclosure: No relevant financial affiliations to disclose.

Adapted with permission from Jardine LA, Woodgate P. Neonatal jaundice. *Clin Evid Handbook*. December 2011:116-117. Please visit <http://www.clinicalevidence.bmj.com> for full text and references. ■