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Neonatal jaundice –Review

Mehran Hesaraki

Department of Pediatrics, Zabol University of Medical Sciences, Zabol, Iran

Abstract

Neonatal jaundice, also known as elevated bilirubin or neonatal icterus, is a yellowish discoloration of the white part of the eyes and skin in a newborn baby due to high bilirubin levels (1-2).All babies born develop somewhat higher levels of bilirubin (more than 2 milligrams per deciliter), but only half of them are diagnosed with jaundice; i.e. above 5 mg / dL;in adults, when bilirubin reaches 2 mg / dL, jaundice appears. The infant must be examined in the daylight and he/she should be naked. Pressing a thumb on the baby's shin can make his red skin colorless; the second after removing the finger, close attention must be paid to the color of skin and recognize whether it is yellow or not. The first place where jaundice is visible is under the tongue and eye scrub. Jaundice begins to appear on the face and as the bilirubin increases, it extends to the legs (Cramer's law), that is, if only the face is yellow, the bilirubin is between 5 and 7, over the chest up to the umbilical cord, about 10, down the abdomen 15 and the tip of the toe are 20.

Keywords: Neonatal, jaundice

Introduction

Neonatal jaundice, also known as elevated bilirubin or neonatal icterus, is a yellowish discoloration of the white part of the eyes and skinin a newborn baby due to high bilirubin levels (1-2).All babies born develop somewhat higher levels of bilirubin (more than 2 milligrams per deciliter), but only half of them are diagnosed with jaundice; i.e. above 5 mg / dL;in adults, when bilirubin reaches 2 mg / dL, jaundice appears (1 - 2).An infant is referred to as 'term' if it has passed 37 weeks or more in their mother's womb. 80% of preterm infants are diagnosed with jaundice (3) .There are two main categories of jaundice in newborns, which include called direct and indirect hyperbilirubinemia. The main causes of indirect hyperbilirubinemia include physiologic jaundice, carpal tunnel syndrome, Gilbert syndrome, breast milk jaundice, abnormal ABO blood type (when the maternal blood group is O and the neonatal blood group is anyone other than O), Rh (when the blood group of the mother is negative and that of the neonate is positive) and G6PD deficiency (4).Infection, cholestasis, or liver cell damage may cause conjunctiva hyperbilirubinemia (direct) that does not have neuropathic toxicity, but it is important to guide the presence of a disease. Neonatal sepsis, neonatal metabolic diseases, such asgalactosemia (high galactose in the blood) or Tirisinemia (elevated tyrosine in the blood), deficiency of alpha-1 antitrypsin and allegyl syndrome are examples of diseases that cause direct hyperbilirubinemia. (5)Induced (non-conjugated) bilirubin rise might be toxic and cause damage to

the brain and lead to cranicetresis, which is a lasting and severe injury to the neonatal system. Therapies such as phototherapy (phototherapy) or blood transfusion may be needed to treat the increased indirect bilirubin (6).

Definition

Neonatal jaundice, also known as elevated bilirubin or neonatal icterus, is a yellowish discoloration of the white part of the eyes and skinin a newborn baby due to high bilirubin levels. The term 'neonate icterus' comes from the Greek term 'Iktepok', meaning yellow. Neonatal hyperbilirubinemia emphasizes the laboratory's side of this disorder, which is the high bilirubin level of the blood; in adults, the normal level of bilirubin is 1.2 mg/dL, and any higher than 2.5 mg will produce a clinically significant jaundice.However, in infants, this is different from that of adults, and clinical jaundice is only visible at a high level of 5 mg/ dL (7). Unlike jaundice in healthy infants (such as physiologic jaundice or breast milk jaundice), prolonged jaundice refers to cases when it lasts more than two weeks in term infants, or more than three weeks in preterm infants (8).

Differential diagnosis

Non-conjugated bilirubin rise

Non-conjugated bilirubin (indirect) is difficult to remove because it is not soluble in water. Each gram of hemoglobin produces 35 milligrams of bilirubin. Non-conjugated bilirubin binds to albumin, which prevents its placement in the brain. Naturally non-conjugated bilirubin should be attached to the liver until it is conjugated and dissolved in water (urine or bile) after removal from albumin (9).

Hemolysis is one of the common causes of jaundice in babies. However, the baby may not appear to have a hemolytic sign, but it may still be jaundiced due to the lack of a bilirubin deficiency mechanism (10).

Table 1-2. Diseases that increase unconjugated bilirubin in newborns (11-15).

No hemolysis	Hemolysis
Physiological jaundice	Incompatibility of blood groups such as ABO, Rh
Gilbert's disease	Toxic septicemia
The infant of diabetic mother	Neonatal infection
Internal bleeding	The enzymatic problem of red blood cells, such as the deficiency of G6PD and pyruvate kinase
Breast milk jaundice	Red blood cell membrane problem like spherocytosis
Polycythemia	Hemoglobinopathies like thalassemia
Hypertrophic pyloric stenosis	
Neonatal hypothyroidism	
Immunological thermobiotechnology	

The rise of conjugated bilirubin

Conjugated bilirubin is not toxic to the brain, but the rise of this type of bilirubin suggests a serious illness in the liver or bile ducts. Direct bilirubinemia occurs when direct bilirubin is greater than 2 mg/dl or more than 20% total bilirubin. Usually, jaundice, due to increased bilirubin conjunctiva, occurs after the second week of life.The infant's parents should be careful that if the infant is defecated with feces like chalk, it is a strong case in favor of obstructive jaundice. When we encounter this kind of hyperbilirubinemia, we should consider the presence of infantile sepsis.In the treatment of direct hyperbilirubinemia, neither phototherapy nor exchange of blood has any application. If a baby has cholestasis (bile duct stasis) in phototherapy, it's possible that the infantile bronchial asthma syndrome appears in which the skin, serum, and urine of the infant find a grayish-brown beige (16).

Table 1. Causes of conjunctivitis bilirubin in neonates (17-18)

Uncommon	Common
Neonatal metabolic diseases (such as galactosemia and Tirisinemia)	Cytomegalovirus infection
Cystic fibrosis	Biliary tightness due to long hemolysis
Biliary atresia	Neonatal Hepatitis
Deficiency of alpha-1 antitrypsin	Cholestasis due to intravenous feeding
Neonatal Hepatitis B	
Choledocal cyst	

Prolonged jaundice

Prolonged jaundice refers to cases when it lasts more than two weeks in term infants, or more than three weeks in preterm infants. If we encounter such cases, we should check the baby diapers. If the feces had a gypsy (rust) or urine-colored and diaper color, we would go for obstructive jaundice.The length of the jaundice should be determined by the size of the conjugated bilirubin. Performing a CBC (blood cell count) test is required for the examination of hemolysis.The maternal and infant blood group should be determined and a direct coombs test should be taken from the infant. Mother and baby should also be questioned about injections of rumen mumps. Mother and baby should also be questioned about injections of rumen mumps. The study of neonatal metabolic diseases (with special attention to thyroid abstinence) is one of the basic principles of diagnosis of prolonged jaundice in infants. The threshold for conjugated bilirubin is 25 μmol / liter (about 2 mg / dL) for the above measures. (19)

The mechanism of development

The fact that high bilirubin in newborns, unlike the adult, might lead to damage to the nervous system in adults, is due to the lack of complete development of the blood-brain barrier of the infants.The cleanliness of the baby's intestine from the bacteria that breaks down, and facilitates the removal of, conjugated bilirubin in the adults is, also, one of the contributing factors, because if excreted bilirubin remains conjugates (solved in the water) in the stool, it is re-absorbed through intrahepatic cycle, that is, the enzyme β-glucuronidase in the intestine converts the conjugated bilirubin into non-conjugated, which is absorbed from the intestinal wall and elevated the non-conjugated bilirubin level; thus, the fast excretion of the stool in the baby lowers the bilirubin level (20-22). The lower number of intestinal bacteria in the infants, in comparison with the adults, is the main reason for the lighter color of their stool.

The lifespan of infants' red blood cells is shorter than that of the adult population, and the hemoglobin concentration of the infants is higher than that of the adult; as a result, the burden imposed on the newborn's liver for excretion is more than that of adults.In addition, liver enzymes of ligandin and glucuronyl transferase are lower than adults, and all of these factors make the baby's bilirubin level higher than that of adults (23).

Diagnosis

The infant must be examined in the daylight and he/she should be naked. Pressing a thumb on the baby's shin can make his red skin colorless; the second after removing the finger, close attention must be paid to the color of skin and recognize whether it is yellow or not. The first place where jaundice is visible is under the tongue and eye scrub. Jaundice begins to appear on the face and as the bilirubin increases, it extends to the legs (Cramer's law), that is, if only the face is yellow, the bilirubin is between 5 and 7, over the chest up to the umbilical cord, about 10, down the abdomen 15 and the tip of the toe are 20 (24).

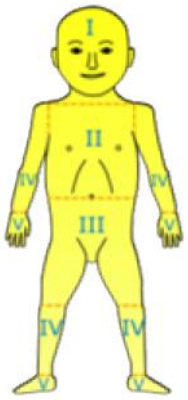

Figure 1. Cramer's law

An emergency blood bilirubin test should be performed after two hours on all infants who have jaundice on the first day; it should be repeated every 6 hours until it is fixed or down. Performing a bilirubin test is common practice for infants who do not have jaundice (25).

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