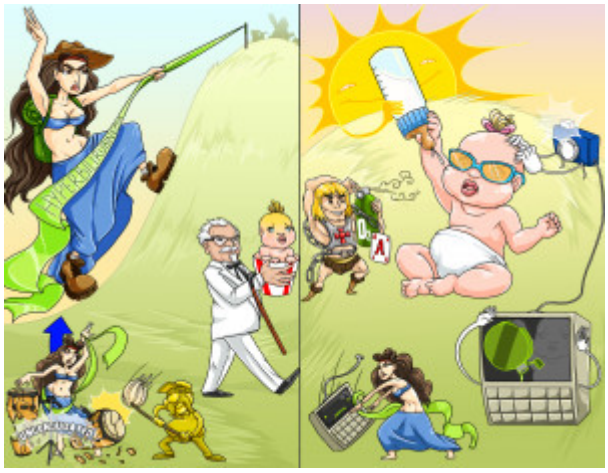
Hyperbilirubinemia

Hyperbilirubinemia is most commonly characterized as excessive levels of unconjugated bilirubin in the blood. Physiologic hyperbilirubinemia is caused by immature liver function or cephalohematoma leading to red blood cell hemolysis. Physiologic hyperbilirubinemia occurs 24 hours after birth, lasts 5-7 days and usually requires no treatment. Pathologic hyperbilirubinemia or hemolytic disease occurs within 24 hours of birth and is caused by blood antigen incompatibility and large numbers of red blood cell hemolysis. Treatment includes phototherapy or exchange transfusions. Early onset breast milk jaundice is related to poor milk intake leading to dehydration and concentrated levels of bilirubin in the bloodstream. Treatment options include frequent breastfeeding and caloric supplements. Late onset breast milk jaundice onsets 5-7 days following birth and may be related to a factor in breast milk. Discontinuing breast feeding for 24 hours will help resolve the jaundice. Jaundice is the primary symptom of hyperbilirubinemia and toxic levels of bilirubin can lead to kernicterus or bilirubin induced encephalopathy. Interventions include early frequent feedings, phototherapy, administration of heme oxygenase inhibitors, and in severe cases exchange transfusion. A transcutaneous bilirubinometry is used to monitor the newborn's bilirubin levels.



PLAY PICMONIC

Cause/Mechanism

Increased Unconjugated Bilirubin

Up-arrow Un-conga Belly-ribbon-dancer

Bilirubin is the byproduct of hemoglobin breakdown caused by red blood cell destruction. When red blood cells break down, bilirubin is released into the bloodstream. Unconjugated bilirubin is insoluble and binds to albumin. Since newborns are not readily available to get rid of unconjugated bilirubin, the substance may accumulate in the blood and tissues leading to hyperbilirubinemia.

Assessment

Jaundice

Jaundice-janitor

Jaundice is a characteristic symptom of hyperbilirubinemia. Since bilirubin has a yellow pigmentation, the newborn with excessive bilirubin levels may develop yellowing of the skin, sclera, and nails. The yellowing of the skin usually begins on the face and moves down the body.

Kernicterus

Colonel

Hyperbilirubinemia may lead to the development of kernicterus or bilirubin encephalopathy. Large amounts of bilirubin circulating in the tissues may cause seizures and irreversible brain damage. Symptoms of kernicterus include decreased activity, lethargy, irritability, and hypotonia.

Interventions

Early Feedings

Early-sun Feeding

Bilirubin is excreted by binding to the stool. Early and frequent feedings help prevent hyperbilirubinemia by promoting stooling and excretion of bilirubin. Increasing the newborn's scheduled feedings to 8-12 times per day helps prevent hyperbilirubinemia.

Heme Oxygenase Inhibitors

He-man Oxygen-ace in Inhibiting-chains

Heme oxygenase inhibitors may be used to prevent hyperbilirubinemia in newborns by inhibiting the enzyme that breaks up heme. Examples include tin protoporphyrin and tin mesoporphyrin.

Phototherapy

Photo-flash

Since bilirubin absorbs light, phototherapy is indicated to decrease bilirubin levels in infants with hyperbilirubinemia. Phototherapy is used throughout the day and the night. The infant is undressed to expose as much skin as possible to the light. However, the genitalia is covered with a diaper and eye protection is worn. During therapy, the infant's fluid intake should be increased to help facilitate the excretion of bilirubin in the urine and stools.

Protect Eyes

Sunglasses

Since the bright light may cause nerve damage to the retina, eye protection is critical for infants with hyperbilirubinemia undergoing phototherapy.

Monitor for Dehydration

Monitor and Empty-canteen

Since phototherapy increases the risk of dehydration, monitoring the newborn's hydration level is critical for maintaining adequate fluid status. Feedings should continue on a regular schedule and may be increased to help increase excretion of bilirubin in the urine and stool. Breastfeeding may be continued and supplemented with expressed breastmilk or formula if the newborn is dehydrated or experiences excessive weight loss.

Considerations

Monitor Bilirubin Levels

Monitor and Belly-ribbon-dancer

Monitoring bilirubin levels in newborns with hyperbilirubinemia is critical for detecting increased levels that may lead to complications such as kernicterus. Transcutaneous bilirubinometry (TcB) may be used to assess the newborn's levels of unconjugated bilirubin. Normal levels of unconjugated bilirubin range between 0.2-1.4mg/dl.