

Neonatal Jaundice



Definition

- Yellow discoloration of the skin and the mucosa due to accumulation of excess of bilirubin in the tissue and plasma in neonates. (more than 7mg/dl).

30-50 % of term newborn

And more of preterm newborns.



Figure – This infant presented with jaundice 8 weeks after birth. The cause was hemolytic disease of the newborn due to Rh incompatibility. The mother's fingers are shown for contrast.

A simple mnemonic for **RISK FACTORS** is
JAUNDICE

- J - Jaundice within first 24 hrs of life
- A - A sibling who was jaundiced as neonate
- U - Unrecognized hemolysis
- N - Non-optimal sucking/nursing
- D - Deficiency of G6PD
- I - infection
- C - Cephalhematoma /bruising
- E - East Asian/North Indian

Causes

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graph TD; A[Causes] --> B[Physiological]; A --> C[Pathological]
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The diagram consists of a red rectangular box at the top containing the word 'Causes'. A small red arrow points downwards from the center of this box to a junction point. From this junction, two arrows branch out: a green arrow pointing down and to the left, and a blue arrow pointing down and to the right. The green arrow points to a green rectangular box containing the word 'Physiological'. The blue arrow points to a blue rectangular box containing the word 'Pathological'. All boxes have a thin white border.

Physiological

Pathological

Physiological Causes

1. Increased red cell volume & increased red cell destruction.
2. Decreased conjugation of bilirubin d/t decreased UDPG-T activity.
3. Increased enterohepatic circulation d/t decreased gut motility.
4. Decreased hepatic excretion of bilirubin.
5. Decreased liver cell uptake of bilirubin d/t decreased ligandin.

Pathological Causes

1. Excessive Red cell hemolysis.
2. Defective conjugation of bilirubin.
3. Breast milk jaundice.
4. Metabolic and endocrine disorders.
5. Increased enterohepatic circulation.
6. Substances and disorders that affect binding.
7. Miscellaneous.

Assessment And Diagnosis

HISTORY

- **onset / duration**
- **pain**
- **nausea & vomiting**
- **loss of weight**
- **itching**
- **color of stool**
- **color of urine**
- **past history**
- **ttt & family history**

EXAMINATION

- **color of skin**
- **severity of jaundice**
- **anemia**
- **liver**
- **spleen**
- **gall bladder**
- **ascites**

Diagnosis

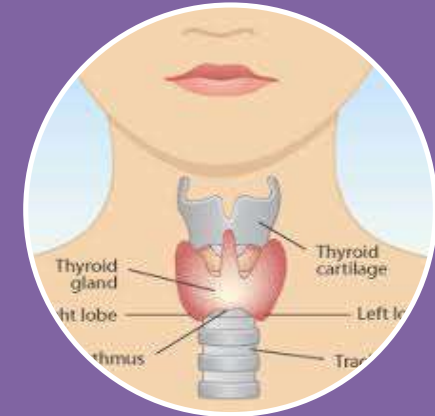


Lab Studies

- Total conjugated & unconjugated bilirubin.
- Complete hemogram
- Blood group status.
- Direct coombs test.
- Serum albumin
- Other lab tests



Radiology & USG



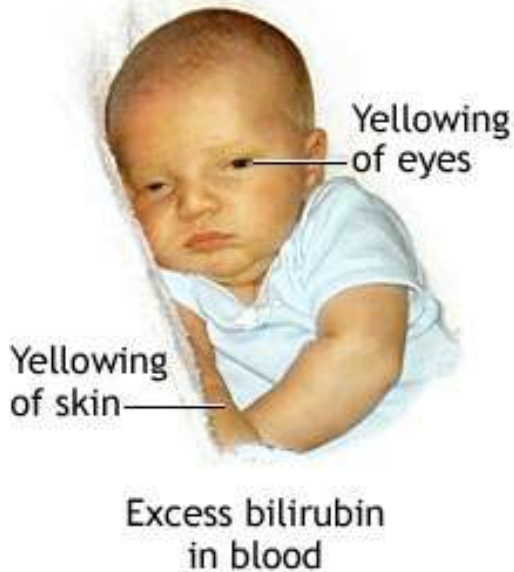
Urine

- Hb electrophoresis
- Osmotic Fragility tests
- Thyroid and LFTs
- G6PD screening.



Signs And Symptoms

Jaundice



Kernicterus



ADAM.

Symptoms may include:

- Yellow coloring of the baby's skin (usually beginning on the face and moving down the body)
- Poor feeding or lethargy

Complications

- Kernicterus

Most Important, Often Fatal.

Medical Management

Phototherapy

**Phenobarbital
Therapy**

Metalloporphyrins

**Exchange
Transfusion**

Phototherapy



- When bilirubin $> 12 \%$
- Discontinued when level fallen $> 2\text{mg/dl}$ of previous.

Babies under phototherapy



TransBilirubin \longrightarrow CisBilirubin isomer + Lumibilirubin

By Photoisomerisation



Excreted in the bile & Urine without
Conjugation.

Technique

6-8 daylight tubes are mounted on a stand and all electrical outlets are well grounded.

Baby is placed naked 45 cm away from the tube lights in a crib or incubator.

Eyes are covered with eye-patches to prevent damage to the retina by the bright lights; gonads should also be covered.

Phototherapy is switched on.

Baby is turned every two hours or after each feed.

Temperature is monitored every two to four hours.

Weight is taken at least once a day.

More frequent breastfeeding.

Urine frequency is monitored daily.

Serum bilirubin is monitored at least every 12 hours.

Phototherapy is discontinued if two serum bilirubin values are < 10 mg/dl.

Contraindication :

Liver disease or obstructive jaundice.

Complications :

Watery diarrhoea

Skin rashes

Dehydration

Bronze baby syndrome

Retinal damage





Side effects of phototherapy

- **Increased insensible water loss:** Frequent Breast feeding.
- **Loose green stools:** weigh often and compensate with breast milk.
- **Skin rashes:** Harmless, no need to discontinue phototherapy.
- **Bronze baby syndrome:** occurs if baby has conjugated hyperbilirubinemia. If so, discontinue phototherapy.
- **Hypo or hyperthermia:** monitor temperature frequently.

Phenobarbital Therapy

↑ ligandin in liver



Induces hepatic enzymes



↑ bilirubin conjugation & excretion

Dose: 10mg/kg Day 1 (loading dose)

5-8 mg/kg/day 4 days (maint. dose)

Or to Mother 2 weeks prior delivery.

Dose: 90 mg/day.

Metalloporphyrins

↓ bilirubin by inhibiting heme oxygenase



Tin & Zinc are currently used.

Exchange transfusion



Indications:

Rise of bilirubin $>1\text{mg/dl/hour}$

To improve anemia & CCF

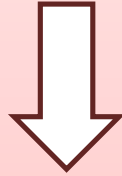
Sr. Bilirubin $> 20\text{mg/dl}$ in first 24 hrs

Cord hemoglobin is $< 12\text{mg/dl}$ & bilirubin is $> 5\text{mg/dl}$

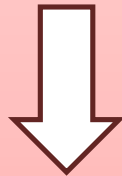
- It is still the most effective and reliable method to reduce serum bilirubin

The procedure involves the incremental removal of the patient's blood and simultaneous replacement with fresh donor blood, saline or plasma.

- The patient's blood is slowly drawn out



- And an equal amount of fresh, prewarmed blood, plasma or physiologic saline is transfused.



- The cycle is repeated until a predetermined volume of blood has been replaced.

Risk and Complications

- Cardiac and respiratory disturbances
- Shock due to bleeding or inadequate replacement of blood
- Infection
- Clot formation
- Rare but severe complications include: air embolism, portal hypertension and necrotizing enterocolitis

Prevention

- Breastfeeding
 - Should be encouraged for most women
 - 8-12 times/day for 1st several days
 - Assistance and education
 - Avoid supplements in non-dehydrated infants



Ongoing assessments for risk of developing severe hyperbilirubinemia

- Monitor at least every 8-12 hours
- Don't rely on clinical exam
- Blood testing
 - Prenatal : ABO & Rh type, antibody
 - Infant cord blood

Nursing Management

Nursing considerations of Hyperbilirubinemia

- **Assessment:**
 - ❖ observing for evidence of jaundice at regular intervals.
 - ❖ Jaundice is common in the first week of life and may be missed in dark skinned babies



Blanching the tip
of the nose

The goals of planning

- **Infant will receive appropriate therapy if needed to reduce serum bilirubin levels.**
- **Infant will experience no complications from therapy.**
- **Family will receive emotional support.**
- **Family will be prepared for home phototherapy (if prescribed).**

