高膽紅素血症(Hyperbilirubinemia)診斷及處理流程-1

**JAUNDICE IN THE NEONATE**

- Perform H and P (history and physical examination)
- Obtain total, direct and indirect bilirubin levels

**Predominantly direct/conjugated hyperbilirubinemia**

- Breast-feeding
  - Onset of jaundice at >24 hours of age
  - Jaundice persists >14 days (one month if breast-fed)
  - Unremarkable maternal history, birth history and family history
  - Healthy infant, normal physical exam
  - Total bilirubin <13 mg/dl (15 mg/dl if breast-fed)
  - Conjugated bilirubin <2 mg/dl (or <20% total)
  - Physiologic jaundice
  - Breast-feeding jaundice
  - CBC with smear
  - Reticulocyte count
  - Infant and maternal blood type
  - Coombs' test

**Predominantly indirect/unconjugated hyperbilirubinemia**

- Observe, consider repeat total bilirubin level

**Isoimmune hemolytic disease**

- Polycythemia
  - Breast-feeding jaundice
  - Breast milk jaundice
  - Physiologic jaundice
  - Extravascular blood
    - (cerebralhematoma, ecchymoses, other hemorrhage)
  - Infection/sepsis
  - Increased enterohemorrhagic circulation
    - (GI obstruction)
  - Hypothyroidism
  - Drugs/toxins
  - Familial hyperbilirubinemia syndromes
  - Gilbert syndrome
  - Crigler-Najjar syndrome
  - Lucey-Driscoll syndrome

**RBC membrane defects**

- Characteristic abnormal RBC morphology

**RBC enzyme deficiencies**

- Sepsis/disseminated intravascular coagulation
- Hemoglobinopathy
高膽紅素血症(Hyperbilirubinemia)診斷及處理流程-II

**JAUNDICE (continued)**

- **Indirect/unconjugated hyperbilirubinemia**
  - CBC with smear
  - Reticulocyte count
  - Coombs' test

- **Reticulocyte count high**

- **Jaundice in the older infant or child**
  - Perform H and P
  - Obtain total, direct and indirect bilirubin levels

- **Direct/conjugated hyperbilirubinemia**
  - PT
  - Albumin
  - Glucose
  - ALT
  - AST
  - GST
  - Alkaline phosphatase

- **Minimally elevated alkaline phosphatase**
  - Perform serology for infectious hepatitis (A-E), EBV, other viruses

- **Markedly elevated alkaline phosphatase, elevated GGT**
  - Perform abdominal ultrasound

**YES**

- RBC membrane defects
- RBC enzyme deficiencies
- Hemoglobinopathies
- Sickle cell disease
- Thalassemias
- Other hemoglobinopathies
- Autoimmune hemolytic anemia
- Drug-induced hemolytic anemia
- Fragmentation hemolysis

**NO**

- Infection
- Drugs/toxins
- Familial hyperbilirubinemia syndromes
  - Gilbert syndrome
  - Crigler-Najjar type I
  - Ains syndrome
  - (Crigler-Najjar type II)
- Prolonged fasting
- Portacaval shunt

- Infectious hepatitis
- Wilson disease
- Drugs/toxins
- Autoimmune hepatitis
- Intrahepatic cholestasis
- Cystic fibrosis
- Veno-occlusive disease
- Familial hyperbilirubinemia syndromes
  - Rotor syndrome
  - Dubin-Johnson syndrome
- Congestive heart failure
- Neoplasm
- Sickle cell disease with intrahepatic sickling

- Gallstones
- Primary sclerosing cholangitis
- Choledochal cysts
- Neoplasm
- Other obstructive lesions