Neonatal Jaundice: Unconjugated Hyperbilirubinaemia

A lighter touch, a righter touch

The neurotoxic sequelae of a high unconjugated bilirubin are unpredictable, potentially devastating, and totally preventable. The occurrence of kernicteris in KZN is alarmingly high.

RATHER OVER-REFER THAN UNDER-REFER

What is jaundice?
Jaundice is the yellow discoloration caused by the presence of bilirubin in the soft tissues.

What causes jaundice
ALL babies develop an elevated bilirubin in the first week of life. This, on the bilirubin pathway, is due to the NORMAL:
1) increased production = accelerated red cell breakdown
2) decreased removal = reduced liver bilirubin handling capacity
3) increased reabsorption = increased enterohepatic recirculation

When jaundice becomes severe enough to treat, the cause is related to an exaggeration of one or more of these factors

1) Increased production:
   Haemolysis (especially rhesus disease and ABO incompatibility), bruising, haematoma, polycythaemia, immaturity, sepsis
2) Decreased removal:
   Immaturity, hepatitis, (pathological enzyme deficiencies are very rare)
3) Increased reabsorption
   Delayed passage of meconium, breast feeding

If you find a baby who is, or may be, or may become jaundiced/yellow...

1) Anticipate jaundice
   • Rhesus negative mother: do cord TSB and repeat at six hours
   • Immaturity: do TSB with first bloods, then 12-24 hourly
   • Sick babies: do a TSB with first bloods, then 12-24 hourly
2) If baby is yellow, do a TSB stat
   TSB may be done as a capillary (heel prick) or venous sample and should be available (bilirubinometer or laboratory) in less than one hour
3) Start phototherapy while awaiting the result if baby is preterm or markedly jaundiced
4) The result must be plotted on a Phototherapy Guideline Chart (Form Paed/34) according to TSB level (micromoles/L), baby's age (in hours NOT days) and weight/gestational age, and acted on immediately
5) All babies whose TSB is high enough for phototherapy should have:
   • mother’s blood group
   • baby’s blood group
   • baby’s Coomb’s

Getting these tests off early assists management planning and may prevent exchange transfusions

6) Well babies should receive phototherapy if their TSB is on/over the phototherapy line for age and weight. Sick babies should go under lights at TSB levels of 30 micromoles/L lower than the line (see both charts overleaf).
7) Repeat TSB for babies under phototherapy must be done 12-24hrly
8) Phototherapy should continue until TSB is 50micm/L less than photo level. TSB must be checked 24hrs after cessation of lights
9) Note the pattern or TSB tracking on the phototherapy chart. Note departure from “physiological” pattern e.g. early TSB rise suggesting haemolysis, or raised TSB after 10 days when phototherapy is no longer indicated (but further investigation may be indicated)
10) If rate of rise of TSB is high, send a blood specimen for conjugated bilirubin, FBC/PCV, and blood culture
11) Check TSB level against Exchange Transfusion chart indicating potential need for exchange transfusion (ETF)
12) Anticipate the need for an exchange transfusion early and consult referral hospital
Phototherapy
- The distance from the light source to mattress must be as close as possible.
- Use correct phototherapy bulb – 400 to 850 nm wavelength.
- Use adequate light intensity: log of hours “on”. Bulbs must be changed after every 1000 hrs of use. Intensity on lightmeter must be > 8 microwatts/cm²/nm.
- Baby must be optimally exposed (no clothes, no nappy).

The baby under phototherapy
- Hydration: give an extra 20ml/kg/day of fluids, unless competently demand breast feeding.
- Eyes must be shielded.
- Breast feeding: give EBM via NGT when TSB is rapidly rising or when close to exchange levels so that baby is not removed from the phototherapy.
- Monitor temperature, dextrostix and urine output 3 hourly.

Exchange transfusion
There is increased risk of kernicterus when:
- preterm baby
- rapidly rising bilirubin (> 17micm/l/hr)
- low levels serum albumin (ALBUSOL® 20% 5ml/kg slowly IV is protective)
- concomitant illness (e.g. sepsis, acidosis)

Exchange transfuse to prevent or lessen kernicterus:
- use the graph to decide on whether to transfuse
- the decision on when to exchange is based on both the absolute level and rate of rise of TSB
- in babies who are ABO or Rhesus incompatible, and Coomb’s positive, POLYGAM® 1g/kg IV over 3 hours, with LASIX 1mg/kg stat, may prevent an exchange transfusion.

Babies with prolonged NNJ (TSB > 150 on day 15) should be investigated. Start with urine dipstix for UTI, TFT’s for hypothyroidism, and urine reducing substances for galactosaemia, then consider breastmilk jaundice.

Babies with conjugated hyperbilirubinaemia must be referred.