PROTOCOL FOR PHOTOTHERAPY

RATIONALE

80% of preterm infants become jaundiced during the first week of life (Rose 2000), compared to 45-60% term newborns (Blackburn 1995). Jaundice is due to excessive accumulation of bilirubin, a product of the degradation of red blood cells, in the blood. Hyperbilirubinaemia, which refers to bilirubin levels that have exceeded a specific level of rate of rise, causes yellow staining of the skin and other tissues, therefore producing jaundice (Kelnar et al. 1995).

Phototherapy is effective in reducing the unconjugated serum bilirubin level in the newborn infant. Exposure to green-blue light at a wavelength of 420-550nm produces water-soluble isomers of bilirubin which are readily excreted by the body in stools and urine. (Roberton 1992)

Phototherapy is used for the treatment of physiological and pathological unconjugated hyperbilirubinaemia. It should not be used to treat conjugated hyperbilirubinaemia as this has a “bronzing” effect on the skin.

PRACTICE

1. Phototherapy is indicated if the serum bilirubin level rises above the phototherapy line. On Trevor Mann Baby Unit, treatment levels are shown on charts which are based on the infant’s gestation. It is important to check that the correct chart has been completed for the infant.

2. It may be appropriate for an infant requiring phototherapy to stay with their mother on the postnatal ward. Careful explanations and reassurance need to be given to alleviate parental anxiety.
3. The infant should be as naked as possible. Naked and exposed infants may feel insecure (Yeo 1998). Positioning with boundaries can be very effective in settling a distressed infant.

4. The phototherapy unit should be positioned 40cm above the infant.

5. Each type of phototherapy we have on TMBU should be treated as a single set of lights. Therefore, two sets of lights are required to give double phototherapy.

6. The Draeger Phototherapy Unit becomes very hot when in use, so before disconnecting from the mains, the fan should be left on for 10 minutes to allow the unit to cool down. With double phototherapy, the serum bilirubin level often falls dramatically. It may then be prudent to change to single phototherapy. If phototherapy is discontinued, there is a risk of a rebound rise in serum bilirubin levels.

7. Consideration should be given to the use of the biliblanket to treat jaundice that is not severe. This promotes bonding as the infant can be cuddled by the parent with this held against the infant’s back, so that they are still receiving treatment (Ludington-Hoe and Swinth 2001). This type of fiberoptic phototherapy has been found to be as effective as conventional phototherapy (Mills and Tudehope 2001), but consideration should be given to the fact that the biliblanket is small, so conventional phototherapy may be more effective in the term infant (Wentworth et al. 2000).

8. The infant’s eyes should be protected from the light with eye pads or the orange perspex head shields. Before applying the eye pads ensure that they are the correct size for the infant, that the infant’s eyes are closed and that the eye pads are secured comfortably. Remove the pads every 4 hours to check for irritation and relieve pressure, which could occlude the nostrils or put the infant at risk of IVH (Yeo 1998). Removal of pads should be co-ordinated with parental visits, as lack of eye contact with the infant can interfere with bonding (Wentworth et al. 2000).

9. The orange perspex head shields can be used if the serum bilirubin level is not too high. Position the shield over the infant’s head but ensure that it is not too low down so as to prevent the phototherapy light from reaching the upper part of the body. The
neonatal head has a much larger surface area ratio to their body (Kelnar et al. 1995), so use of a tinted shield risks covering a lot of area that could be exposed to the treatment lights.

10. Ensure that any infants in adjacent cots are shielded from the light with covers. Bright light can cause reduced oxygenation and altered sleep patterns (Merenstein and Gardner 1998).

11. The infant’s thermal environment and body temperature must be carefully monitored and maintained. The infant requiring phototherapy is at risk of hypothermia as the infant is nursed naked to ensure maximum skin exposure to the phototherapy light. The infant nursed in an incubator is at risk of hyperthermia due to the radiant heat from the phototherapy unit increasing the ambient air temperature. The infant’s axilla temperature should therefore be checked at least 4 hourly and the incubator temperature altered accordingly. Once phototherapy treatment has been discontinued, the incubator temperature may need to be altered.

12. The infant’s fluid balance must be carefully monitored as phototherapy increases fluid loss through the skin and gut. It is not the policy of Trevor Mann Baby Unit to routinely increase fluids during treatment. However, consideration should be given to administering humidity at 40% under 35 weeks gestation. Urine specific gravity, weight and electrolyte balance need to be monitored to assess for any signs of dehydration. Infants who were breast or bottle feeding may need tube feeding due to the lethargy which often accompanies jaundice.

13. Serum bilirubin levels are checked at regular intervals and re-checked 12-24 hours after phototherapy treatment has been discontinued.

14. Keep the infant’s gonads covered during treatment with a small nappy or with the nappy tucked down as far as possible, to protect against chromatic radiant damage (Schwoebel and Sakraida 1997).
15. Check the skin at least 6 hourly for signs of excoriation due to loose stools from lumirubin excretion (Dent 2000).

16. Do not use cream or oil during treatment, as this may increase the risk of burns from the lights (Schwoebel and Sakraida 1997).

17. If the infant is receiving breast milk via a tube feed, keep this away from the phototherapy lights, as they have been found to cause lipid peroxidation in the milk (Van Zoeren-Grobben et al. 1993).

REFERENCES


