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CURRENT USE OF PHOTOTHERAPY (PTX) AND MONITORING OF TOTAL SERUM BILIRUBIN IN EXTREMELY LOW BIRTH WEIGHT (ELBW) INFANTS

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Background: The effects on outcomes of ELBW infants of hyperbilirubinemia and PTx treatment have not been evaluated in a randomized trial.^{1,2,3} Strategies for management of hyperbilirubinemia and PTx use have been derived from studies involving term and very low birth weight infants.^{4,5,6,7} Technology and practice patterns may have changed since the only major randomized trial in preterm infants was done in 1974.^{8,9}

Objective: In designing a large, randomized trial of PTx in ELBW infants, we performed a survey to determine: 1) the current PTx devices and their irradiance levels, and 2) the initiation and frequency of total serum bilirubin (TSB) levels in ELBW infants.

Methods: Research nurses at 16 academic centers of the NICHD Neonatal Research Network (NRN) completed a survey of PTx use in their hospitals. At Centers with spectroradiometers the research nurses measured and recorded the irradiance of 5 PTx lights used in their units at 35 cm from the light source. The research nurses reviewed the charts of 10 consecutive ELBW infants who survived at least 30 days. Data was recorded on the timing and frequency of TSB levels in the first 14 days of life. Because some centers have more than one affiliation, 24 hospitals are represented.

Results: Only 38% of the hospitals regularly checked the irradiance level during PTx. The mean and standard deviation of irradiance levels recorded on 68 lights was $21.3 \pm 16 \mu\text{Watts/cm}^2/\text{nm}$. The type of phototherapy used is depicted in this table.

| | | Hospitals (n) |
|--|----------------------------|---------------|
| Initial mode of Phototherapy (More than one answer possible) | Bank of fluorescent lights | 13 |
| | Spotlights (halogen) | 10 |
| | Biliblankets (fiberoptic) | 15 |
| | Warmer lights (halogen) | 1 |
| What types of "over bed" lights used? (More than one answer possible) | White | 6 |
| | White/Blue | 12 |
| | Blue | 8 |
| | Spot lights | 12 |

161 charts of ELBW infants were reviewed by the research nurses.

| | |
|---|-----------------|
| Day of Life 1 st TSB (Mean, Range) | 1.65 (1-6) |
| % of infants with TSB checked < 24 hours | 79% |
| Day of Life- Peak TSB (Mean, Range) | 4.9 days (1-14) |
| On how many days between DOL 1-14 was a TSB done? (Mean, Range) | 8.7 days (1-14) |
| % of infants with a TSB q day for 14 d | 18.2% |

Conclusions: Phototherapy practices varied widely amongst the NRN hospitals in the mode of phototherapy, types of lights, and monitoring of irradiance and TSB. The mean irradiance level was 2-3 times as high as those observed in the 1974 NICHD Phototherapy trial.¹⁰ This information supports the need for a large randomized trial of aggressive vs. conservative use of phototherapy in ELBW infants as is currently being conducted by the NICHD Neonatal Research Network.

References

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