AAP Issues Guidelines on Neonate Phototherapy

The American Academy of Pediatrics provides recommendations aimed to standardize phototherapy practices for the treatment of hyperbilirubinemia in newborns.

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September 26, 2011 – The American Academy of Pediatrics (AAP) has issued a technical report containing recommendations intended to standardize the use of phototherapy treatment for the optimal management of hyperbilirubinemia in newborn infants 35 or more weeks of gestation.

Vinod K. Bhutani, MD, professor of pediatrics and neonatology at Stanford University, in California, and colleagues with the AAP's Committee on Fetus and Newborn, published the technical report in the September 26, 2011 online issue of *Pediatrics*.

According to the report, despite the proven usefulness of phototherapy for the treatment of hyperbilirubinemia in newborns, the actual efficacy of the treatment varies due to differences in the light sources used and in their configuration.

Besides summarizing factors that need to be considered for the optimal administration of phototherapy for newborn hyperbilirubinemia, the authors make three major recommendations.

The first recommendation concerns the light-emission characteristics of the phototherapy devices for the treatment of hyperbilirubinemia. Factors under consideration include the emission wavelength of the light source and its light intensity.

The authors recommend, as most effective, the use of devices for the treatment of hyperbilirubinemia that emit light in the blue-green (~460-490 nm) region of the visible spectrum. Especially suitable might be devices that contain high intensity gallium nitride light-emitting diodes, as they have a long lifetime, low heat output, and low ultraviolet emission, they note.

Additionally, attention should be paid to the number of photons delivered per unit area of exposed skin, termed irradiance. The AAP recommends the irradiance used for phototherapy to be at least $30\mu W.cm^{-2}nm^{-1}$ within the wavelength of 460-490 nm. As irradiance is not distributed uniformly over the infant's body surface, irradiance should be measured at several sites to ensure the delivery of an appropriate light dose.

The second major recommendation in the AAP report focuses on maximizing the light-exposed body surface area in order to improve the efficacy of the phototherapy treatment. Physicians should try to minimize the use of physical obstructions on the newborn's body, e.g. large diapers, insulated plastic covers, etc. The use of circumferential phototherapy, allowing the exposure of approximately 80% of the body surface to light, is suggested.

Thirdly, periodic monitoring of the clinical efficacy of phototherapy is recommended in order to guide decisions about the continuity and duration of therapy. Phototherapy is expected to lead to a rapid decrease in serum bilirubin concentrations within 4 to 6 hours of therapy. The treatment might be briefly interrupted, after confirmation of appropriate bilirubin concentration decrease, to allow for infant feeding and bonding to the mother. The authors, however, warn that caution is required when considering discontinuation of therapy because: "the value of these [bilirubin] measurements can be confounded by changes in bilirubin production or elimination and by a sudden increase in bilirubin concentration (rebound) if phototherapy is stopped".

"Standardization of irradiance meters, improvements in device design, and lower-upper limits of light intensity for phototherapy units merit further study," Dr. Bhutani and colleagues conclude.