Safety and Efficacy of Filtered Sunlight in Treatment of Jaundice in African Neonates

Tina M. Slusher, MD, Hendrik J. Vreman, PhD, Bolajoko O. Olusanya, MD, PhD, Ronald J. Wong, BA, Ann M. Brearley, PhD, Yvonne E. Vaucher, MD, MPH, and David K. Stevenson, MD

ABSTRACT

OBJECTIVES: Evaluate safety and efficacy of filtered-sunlight phototherapy (FS-PT).

METHODS: Term/late preterm infants ≤14 days old with clinically significant jaundice, assessed by total bilirubin (TB) levels, were recruited from a maternity hospital in Lagos, Nigeria. Sunlight was filtered with commercial window-tinting films that remove most UV and significant levels of infrared light and transmit effective levels of therapeutic blue light. After placing infants under an FS-PT canopy, hourly measurements of axillary temperatures, monitoring for sunburn, dehydration, and irradiances of filtered sunlight were performed. Treatment was deemed safe and efficacious if infants were able to stay in FS-PT for ≥5 hours and rate of rise of TB was <0.2 mg/dL/h for infants ≤72 hours of age or TB decreased for infants >72 hours of age.

RESULTS: A total of 227 infants received 258 days of FS-PT. No infant developed sunburn or dehydration. On 85 (33%) of 258 treatment days, infants were removed briefly from FS-PT due to minor temperature-related adverse events. No infant met study exit criteria. FS-PT was efficacious in 92% (181/197) of evaluable treatment days. Mean ± SD TB change was –0.06 ± 0.19 mg/dL/h. The mean ± SD (range) irradiance of FS-PT was 38 ± 22 (2–115) µW/cm²/µm, measured by the BiliBlanket Meter II.

CONCLUSIONS: With appropriate monitoring, filtered sunlight is a novel, practical, and inexpensive method of PT that potentially offers safe and efficacious treatment strategy for management of neonatal jaundice in tropical countries where conventional PT treatment is not available.

Key Words: newborn jaundice, hyperbilirubinemia, sunlight, phototherapy, irradiance, UV, IR, low-middle income countries