

Re: Chang's Score Is Only Helpful Within the First 4 to 5 Days of Life

The American Academy of Pediatrics Subcommittee on Hyperbilirubinemia acknowledged the fact that there is no standard for discontinuing phototherapy.¹ For infants who are readmitted after birth, it recommends that phototherapy may be discontinued when the total serum bilirubin level (TSB) falls to <13 to 14 mg/dL (239–239 $\mu\text{mol/L}$).¹

On the basis of a huge cohort of newborns treated for hyperbilirubinemia, Chang et al² thankfully provided an evidence-based prediction tool (score) to help clinicians decide when to stop phototherapy in birth-hospitalized infants with rebound hyperbilirubinemia to avoid readmission and retreatment.

However, applying this prediction score (Score = 15 [if gestational age <38 weeks] – 7 × [age in days at phototherapy initiation] – 4 × [AAP phototherapy threshold (TSBth)] – total serum bilirubin at phototherapy termination [TSBtm] + 50) is only sensible in newborns that need phototherapy within the first 4 to 5 days of life.

This is because when applying the score for a mature infant on its sixth day of life with an initial TSB of 20 mg/dL, the rebound likelihood according to the Chang score would be 0 when the TSB came only down to 18 mg/dL (50 – [7 × 6] – 4 × [20 mg/dL – 18 mg/dL] = 50 – [42] – 8 = 0). From the seventh day onward, virtually no more phototherapy would be necessary at all, irrespective of the bilirubin levels.

In the case of the recent 100 mature newborns referred to our communal children's hospital in Cologne, Germany, for treatment of hyperbilirubinemia, 35.2% of infants were ≥ 6 days of age.

Most of these ≥ 6 days of age infants were breastfed, with huge problems in the initiation of the nursing management in combination with weakness of drinking, which was documented in the weight loss (up to 15% of the birth weight) in these infants.

In our experience, a sufficient milk supply is essential in an effective therapy of hyperbilirubinemia, and it is necessary to apply the Chang rule even in the first days of life.

In summary, I want to emphasize that Chang's score is only helpful to decide when to terminate a first phototherapy within the first 4 to 5 days of life and, importantly, only if a safe milk supply is established.

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CONFLICT OF INTEREST: The author has indicated he has no potential conflicts of interest to disclose.

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Authors' Response

We thank Dr Korsch for his insightful comments. The study cohort in which we developed and validated our prediction rule is younger than the one Dr Korsch describes. Of the infants in our cohort, 96.5% started their first inpatient phototherapy before age 5 days, and we agree that the prediction rule did not capture the probability of rebound hyperbilirubinemia in older infants who undergo their first inpatient phototherapy. For these older infants with significant weight loss, presumably once their feeding difficulties are resolved, their probability of rebound hyperbilirubinemia would be low, although certainly not 0.

In addition, we agree with Dr Korsch that adequate feeding is an essential part of the treatment of hyperbilirubinemia. We do not believe, however, that a sufficient milk supply is necessary to apply the prediction rule. Given the young age of our study cohort (average age of 2.3 days at phototherapy initiation), it is likely that breastfeeding was not well established for many of these infants, and 70% of our cohort received at least 1 formula feeding during phototherapy hospitalization. The senior authors of this article are currently investigating weight loss and feeding in more detail as predictors of readmission for phototherapy.

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