FPIN's Clinical Inquiries

Rebound Bilirubin Levels after Phototherapy in Neonates with Hyperbilirubinemia

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Clinical Question

In term newborns with hyperbilirubinemia treated with phototherapy, how often does obtaining a rebound bilirubin level four to six hours after discontinuation of phototherapy result in restarting phototherapy?

Evidence-Based Answer

Rebound elevation of bilirubin levels after phototherapy discontinuation in healthy term neonates is infrequent (fewer than 2% of infants with levels less than 14 mg per dL [239 mmol per L] at initial discontinuation). Obtaining a repeat bilirubin level four to six hours after phototherapy discontinuation is not recommended. Repeat testing does not decrease rates of restarting phototherapy, adds expense, and prolongs hospitalizations. (Strength of Recommendation [SOR]: B, based on a retrospective cohort study, three retrospective chart reviews, and a clinical guideline.)

A repeat total serum bilirubin level should be obtained within 24 hours after discontinuing phototherapy in neonates with known hemolytic disease (positive Coombs test result) because significant rebound has been reported in these patients. (SOR: B, based on two retrospective studies and a clinical guideline.) Neonates with significant risk factors for hyperbilirubinemia (e.g., prematurity, low birth weight) are at higher risk of rebound hyperbilirubinemia, and rebound levels should be considered. (SOR: C, based on two retrospective studies.)

Evidence Summary

A 2015 retrospective cohort study of 226 neonates who received phototherapy for hyperbilirubinemia found that those who underwent repeat bilirubin measurement were not readmitted more often than those who were not retested ($P = .98$).[1] Infants who were retested had significantly longer hospital stays (27.7 vs. 23.2 hours; $P = .001$). Five of 130 infants from the rebound testing group and four of 96 infants from the non–rebound testing group were readmitted for phototherapy. Those with bilirubin levels less than 14 mg per dL at the time of phototherapy discontinuation were unlikely to require repeat phototherapy.

A 2002 retrospective review of 301 neonates with hyperbilirubinemia examined total serum bilirubin levels prior to and within 24 hours of phototherapy discontinuation in infants with both positive and negative Coombs test results.[2] The difference in mean total serum bilirubin levels was significantly lower at follow-up and did not show rebound elevations in either group (11.3 ± 2.7 mg per dL [193 ± 46 mmol per L] at discontinuation; 11.0 ± 2.6 mg per dL [188 ± 45 mmol per L] at follow-up). Repeat phototherapy was required for six infants.

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Two additional retrospective studies examined whether it is necessary to keep term infants in the hospital to recheck bilirubin levels. In the first study (N = 264), repeat bilirubin levels were analyzed to determine whether rebound occurred.[3] Total serum bilirubin levels did not significantly rebound after phototherapy discontinuation (–0.3 ± 1.5 mg per dL [–5 ± 26 mmol per L]; $P = .3$). The second study examined the need for repeat phototherapy in 303 neonates who received phototherapy prior to discharge or were readmitted for phototherapy.[4] Neonates in both groups were not likely to need repeat phototherapy, and no significant rebound occurred ($P = .002$). Thirteen of 158 infants who received phototherapy before initial hospital discharge required repeat phototherapy, compared with one of 144 who were readmitted; this difference was attributed to the fact that 22% of infants in the former group were Coombs positive, compared with only 3.5% in the latter group.

Recommendations from Others

In 2004, the American Academy of Pediatrics released a clinical guideline on the management of hyperbilirubinemia in neonates born at or after 35 weeks' gestation.[5] It recommended that hospital discharge not be delayed to observe the infant for rebound hyperbilirubinemia if the total serum bilirubin level was less than 13 to 14 mg per dL at discontinuation. However, it recommended that a repeat bilirubin level be obtained within 24 hours in neonates with known hemolytic disease.

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