Transcutaneous bilirubinometry: comparison of two multiwavelength devices in healthy term newborns

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The nomogram developed recently by Yu et al. [2] is the only one available up to date for the new JM-103 bilirubinometer. We conducted a small study to compare the accuracy and capability to predict significant hyperbilirubinemia of two new multiwavelength transcutaneous bilirubinometers as part of a quality improvement project that pretends to introduce one of these devices in a community-based hospital. Seventy-one full-term newborns were included in this study and were performed three different measurements: TSB via heel stick, TcB level with Minolta JM-103, and TcB level with Respironics BiliCheck. The levels of bilirubin were categorized according to the risk zones of hyperbilirubinemia, as either low-risk zone, intermediate-risk zone, or high-risk zone based in the JM-103 nomogram by Yu et al. and the BiliCheck nomogram published by Varvarigou et al. [1, 2]

The mean total serum bilirubin was 7.56 ± 2.48 mg/dL. The mean levels of TcB were 7.3 ± 2.8 for JM-103 and 7.9 ± 3.1 for BiliCheck. Both devices were strongly correlated with TSB ($r=0.86$ for JM-103 and $r=0.85$ for BiliCheck). The mean difference of serum and transcutaneous levels is -0.11 ± 1.43 for JM-103 and for 0.42 ± 1.61 for BiliCheck.

The correlation coefficient for fair, dark intermediate, and dark skin was $r=0.91$, 0.89 , and 0.72 respectively with JM-103 and $r=0.87$, 0.90 , and 0.70 respectively with BiliCheck. The sensitivity to predict significant hyperbilirubinemia is 98.7% for JM-103 and 85.7% for BiliCheck.

Both devices are reliable, accurate, and sensitive to be used clinically distinguishing those babies who need further assessment and follow-up. JM-103 was more accurate, and the measurements can be assessed with this monogram with high accuracy to predict significant hyperbilirubinemia.

References

1. Varvarigou A, Fouzas S, Skylogianni E, Mantagou L, Bougioukou D, Mantagos S (2009) Transcutaneous bilirubin nomogram for prediction of significant neonatal hyperbilirubinemia. *Pediatrics* 124(4):1052–1059
2. Yu ZB, Dong XY, Han SP, Chen YL, Qiu YF, Sha L, Sun Q, Guo XR (2011) Transcutaneous bilirubin nomogram for predicting neonatal hyperbilirubinemia in healthy term and late-preterm Chinese infants. *Eur J Pediatr* 170(2):185–191

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