

Transcutaneous Bilirubin Monitoring in the Neonatal ICU

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Introduction/ Abstract

- The American Academy of Pediatrics recommends that all newborns be screened before discharge with a total serum bilirubin (TSB) or transcutaneous bilirubin (TcB) measurement.
- Non-invasive TcB measurement is quick and provides reasonable estimate of bilirubin levels in healthy newborns \geq 35 weeks gestational age (GA) and may decrease TSB occurrences.

Specific Aims

- Our goal is to establish a consistent practice of TcB monitoring for hyperbilirubinemia screening in infants \geq 35 weeks GA admitted to the NICU to reduce the number of blood draws.

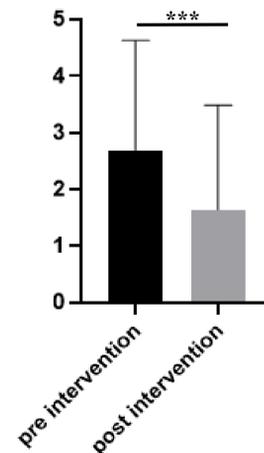
Methods

- Retrospective cohort analysis was performed comparing pre-intervention group July 2020- June 2021 and post-intervention group July 2021-January 2022
- Pre-intervention TSB was used for screening
- Post-intervention TcB was used as 1st line screening
- First TcB is performed at 24 hours of life and continued daily with total occurrences based on Bhutani risk stratification; 3 occurrences for low risk (LR), 7 for medium risk (MR) and high risk (HR)
- If levels fell within 3 TSB thresholds for phototherapy, serum levels were drawn
- TSB draws were compared between pre- and post-intervention
- Statistical analysis was performed via Mann-Whitney-T-Test

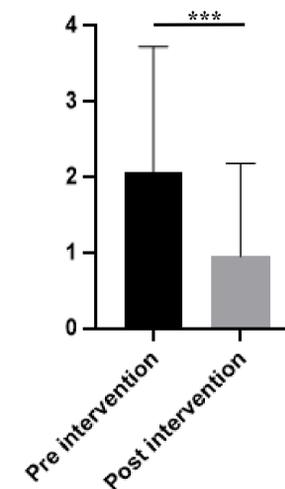
Results

- 293 patients were identified, 136 pre-intervention and 157 post-intervention patients
- 10 pre-intervention and 22 post-intervention patients were excluded for pathology necessitating regular liver function tests per unit protocol
- Statistically significant reduction in TSB blood draws was observed following TcB protocol implementation (Pre-intervention 2.6 ± 1.8 vs post-intervention 1.6 ± 1.8 , *** $p < 0.001$)
 - Retained in LR (Pre-intervention 2.0 ± 1.4 vs post-intervention 0.9 ± 1.2 , *** $p < 0.001$) and MR (Pre-intervention 3.1 ± 1.7 vs post-intervention 1.8 ± 2.0 , *** $p < 0.001$)
 - Not retained in HR (Pre-intervention 3.5 ± 1.7 vs post-intervention 3.2 ± 2.0 , P value 0.835)
- 34% (54/157) of newborns in post-intervention only required TcB screening
- 73% (53/73) of newborns in post-intervention that had TSB following TcB were found to have TcB correlating within 3 measures and 67% of TSB levels were lower than TcB levels (44/67) when measured differences were >3

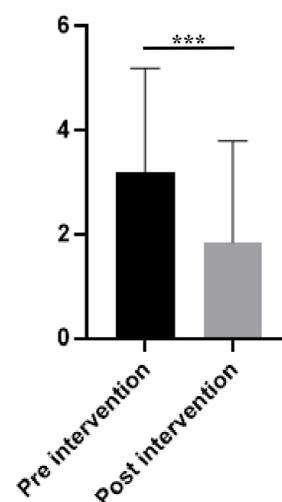
Overall serum bili draws pre vs post intervention



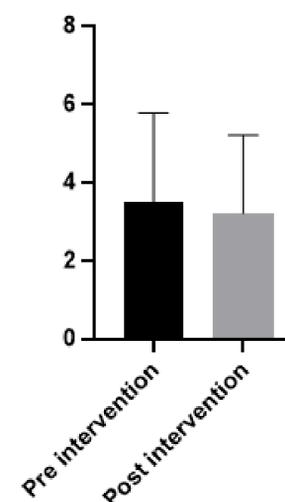
Low risk TSB



Medium risk TSB



High risk TSB



| Post-Intervention Analysis | |
|---|--------------|
| TSB and TcB correlation ≤ 3 measures | 73% (53/73) |
| TSB levels lower than TcB levels | 67% (44/67) |
| Only required TcB screening | 34% (54/157) |

Conclusions

- TcB screening reduced serum blood draws in qualifying neonates with LR and MR hyperbilirubinemia stratification
- With most TSB levels correlating with or were below TcB levels, it would be safe to narrow the window for serum blood draws, which may further reduce draws
- Outstanding results are encouraging as post intervention results reflect most immediate outcomes following protocol implementation. Providers and nursing staff have reported positive feedback and satisfaction of protocol towards goal of reducing blood draws

Acknowledgements

Our entire nursing staff of NICU, attending as well as resident physicians and nurse practitioners.