Title: Prevalence of neonatal hyperbilirubinaemia and its association with glucose-6-phosphate dehydrogenase deficiency and blood-type incompatibility in sub-Saharan Africa: a systematic review and meta-analysis

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Abstract

Background: Hyperbilirubinaemia is a silent cause of newborn disease and death worldwide. However, studies of the disease in sub-Saharan Africa are highly variable with respect to its prevalence. Hence, this study aimed to estimate the overall magnitude of neonatal hyperbilirubinaemia and its association with glucose-6-phosphate dehydrogenase (G6PD) deficiency and blood-type incompatibility in sub-Saharan Africa.

Methods: PubMed, Scopus, Google Scholar and the Cochrane Review were systematically searched online to retrieve hyperbilirubinaemia-related articles. All observational studies reported the prevalence of hyperbilirubinaemia in sub-Saharan Africa were included for analysis and excluded if the study failed to determine the desired outcome. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed. Heterogeneity across the included studies was evaluated using the inconsistency index (I^2). Subgroup and meta- regression analysis were also done. Publication bias was examined by funnel plot and the Egger's regression test. The random-effect model was fitted to estimate the pooled prevalence of neonatal hyperbilirubinaemia. The meta-analysis was performed using the STATA V.14 software.

Results: A total of 30 486 studies were collected from the different databases and 10 articles were included for the final analysis. The overall magnitude of neonatal hyperbilirubinaemia was 28.08% (95% CI20.23 to 35.94, I^2=83.2) in sub-Saharan Africa. Neonates with G6PD deficiency (OR 2.42, 95% CI 1.64 to 3.56, I^2=37%) and neonates that had a blood type that was incompatible with their mother's (OR 3.3, (95% CI 1.96 to 5.72, I^2=84%) were more likely to develop hyperbilirubinaemia.

Conclusion: The failure to prevent and screen G6PD deficiency and blood-type incompatibility with their mother's results in high burden of neonatal hyperbilirubinaemia in sub-Saharan Africa. Therefore, early identification and care strategies should be developed to the affected neonates with G6PD deficiency and blood-type incompatibility with their mother's to address long-term medical and scholastic damages among those exposed to hyperbilirubinaemia.

Keywords: jaundice; neonatology; nursing Care; qualitative research; statistics.

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