Sn-mesoporphyrin controlled neonatal hyperbilirubinaemia faster than phototherapy


Objective
To compare a single dose of Sn-mesoporphyrin (SnMP) with phototherapy for hyperbilirubinaemia in term and near-term newborn infants.

Design
2 sequential randomised controlled trials.

Setting
A maternity hospital in Greece.

Patients
For study 1, 22 pairs of term boys who were between 36 and 84 hours old and who had hyperbilirubinaemia (defined by age-specific plasma bilirubin levels); for study 2, 20 pairs and 2 unpaired infants who were born between 245 and 265 days gestation, who were between 36 and 96 hours old, and who had hyperbilirubinaemia. Exclusion criteria were direct Coombs-positive haemolytic disease, glucose-6-phosphate dehydrogenase deficiency, congenital anomalies, suspected congenital infection, birth asphyxia, or admission to the neonatal intensive care unit.

Main Outcome Measure
Resolution of hyperbilirubinaemia. Pairs were considered untied (that is, one or both treatments were judged to have failed) when members receiving SnMP required phototherapy, when either member required exchange transfusion, or when one member took ≥1 day longer than the other to resolve hyperbilirubinaemia.

Main Results
No patients required an exchange transfusion, and no infant treated with SnMP required phototherapy. In 20 of the 22 pairs of babies in study 1 and in 12 of 20 pairs of babies in study 2, the time to resolution of hyperbilirubinaemia was shorter by ≥1 day in patients receiving SnMP. When patients in the 2 studies were combined, patients receiving SnMP resolved their hyperbilirubinaemia 30 hours sooner than did those receiving phototherapy, and 35% of the latter “rebounded” and required a second course of phototherapy.

Conclusion
A single dose of Sn-mesoporphyrin was superior to phototherapy in reducing the time to resolution of hyperbilirubinaemia in term and near-term newborn infants.

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Commentary
Neonatal jaundice is mostly a minor nuisance, but it generates parental anxiety, inconvenience, and the use of medical resources. Strategies that might simplify the management of jaundice in healthy term newborns deserve a high priority for research.

Sn-mesoporphyrin (SnMP) is an inhibitor of heme oxygenase, the enzyme responsible for the first step in degrading the protoporphyrin ring of haemoglobin. Previous research has shown that SnMP retards the development of neonatal jaundice (1, 2). This study goes a step further by showing that a single dose of SnMP given to term and near-term newborns entirely replaced the need for phototherapy. The duration of jaundice of a degree sufficient to warrant the continuation of monitoring was reduced by an average of some 30 hours in newborns receiving SnMP compared with those receiving phototherapy.

Is SnMP the answer to the current uncertainties surrounding the management of nuisance jaundice, and do we have a real resource-saver here? We may well have, but this study does not tell us how widely its important results might be applied. Eligibility for the trial, based on a chart of defined threshold bilirubin concentrations, could be as low as 7 mg/dL in babies 36 hours old or as high as 19 mg/dL in babies 84 hours old.

Nevertheless, these exciting results certainly justify proceeding with further trials that clarify the distributions of individual bilirubin concentrations at entry and that use more fixed sampling times for bilirubin monitoring.

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References