If treated, babies with moderately severe hyperbilirubinaemia develop normally

**Research question** What happens to term babies who develop moderately severe hyperbilirubinaemia?

**Answer** With treatment, almost all of them develop normally.

**Why did the authors do the study?** Although extremely high concentrations of bilirubin in newborns can cause devastating brain damage, the long term effects of less extreme hyperbilirubinaemia are not as clear. The authors wanted to find out what happened to babies that were otherwise healthy but developed moderately severe hyperbilirubinaemia (serum concentration of bilirubin >428 μmol/l) within 30 days of birth.

**What did they do?** They identified 140 infants with serum concentrations of bilirubin >428 μmol/l and a comparison cohort of 419 control infants with serum concentrations <428 μmol/l. All were born at or near term in California from 1995 through 1998. Researchers who did not know which group the infants had been placed in assessed the neurological development of the children at a mean age of 5 years. Other data on development came from questionnaires given to the parents and medical records. Most of the babies with hyperbilirubinaemia were treated with phototherapy alone. Five had exchange transfusions.

The authors compared neurological development in the two groups of children and then did further analyses to find out if severity or duration of hyperbilirubinaemia had any impact on outcome. Finally, they did a subgroup analysis with the small minority of infants with evidence of immune mediated haemolytic disease.

**What did they find?** Children who had been treated for hyperbilirubinaemia did as well as control children in all tests, including tests for intelligence, visual motor integration, and motor skills. They were no more likely to have neurological abnormalities than controls, and responses from parents on questionnaires about development and behaviour were similar.

Severity and duration of hyperbilirubinaemia had no impact on outcome, although most children (130 out of 140) had peak bilirubin concentrations no higher than 511 μmol/l. Peak values fell quickly in most children. None of the infants developed kernicterus.

The nine children with immune mediated haemolytic disease did significantly worse on tests of intelligence and visual motor integration than 61 children with hyperbilirubinaemia but no immune mediated haemolytic disease.

**What does it mean?** These findings are largely reassuring. The authors could find no evidence that moderately severe hyperbilirubinaemia, if treated, causes any long term neurological or behavioural problems in children born at or near term. But there were too few children in this study to say with any certainty what happens to infants whose bilirubin concentration rises above 513 μmol/l.

Follow-up was incomplete, however. Developmental data were available for more than 90% of children at 2 years, but only 59% of children with hyperbilirubinaemia and 40% of controls were assessed fully at 5 years.

The small subgroup of children with immune mediated haemolysis did worse than the rest, which is consistent with US guidelines recommending more aggressive treatment for these infants.


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