

Patients With Biliary Atresia Have Elevated Direct/Conjugated Bilirubin Levels Shortly After Birth



WHAT'S KNOWN ON THIS SUBJECT: Infants with biliary atresia (BA) have better outcomes if detected and treated early, typically before 8 weeks of age. Making an early diagnosis is difficult, however, because newborns appear healthy and start developing disease at an unknown time.



WHAT THIS STUDY ADDS: Patients with BA have elevated direct/conjugated bilirubin (DB/CB) levels at birth. BA could be detected earlier if: (1) all newborns have DB/CB levels measured, including those not jaundiced; and (2) all elevated DB/CB levels are followed, independent of total bilirubin measurements.

abstract



OBJECTIVES: Healthy infants are thought to acquire biliary atresia (BA) in the first weeks of life. Because those diagnosed earlier have better outcomes, we were interested in determining the earliest time BA could be detected. We started by examining the immediate postnatal period, hypothesizing that newborns would not yet have acquired disease and still have normal direct/conjugated bilirubin (DB/CB) levels.

PATIENTS AND METHODS: Newborn DB/CB levels were obtained retrospectively from birth hospitals. Subjects with BA were born between 2007 and 2010 and cared for at Texas Children's Hospital. Those with BA splenic malformation syndrome or born prematurely were excluded. Control subjects were term newborns who later never developed neonatal liver disease.

RESULTS: Of the 61 subjects with BA, 56% had newborn DB/CB levels measured. All DB/CB levels exceeded laboratory norms and rose over time. At 24 to 48 hours of life, subjects with BA had mean DB levels significantly higher than those of controls (1.4 ± 0.43 vs. 0.19 ± 0.075 mg/dL, $P < .0001$), even while their mean total bilirubin (TB) levels remained below phototherapy limits. Finally, despite the elevated DB/CB levels, the majority of patients (79%) had normal DB:TB ratios ≤ 0.2 .

CONCLUSIONS: Patients with BA have elevated DB/CB levels shortly after birth. To detect affected infants earlier and improve outcomes, the results suggest two possibilities: (1) screen all newborns for elevated DB/CB levels, rather than just those who appear jaundiced; and then (2) follow all newborns with elevated DB/CB levels, rather than just those with DB:TB ratios >0.2 . *Pediatrics* 2011;128:e1428–e1433

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KEY WORDS

biliary atresia, direct bilirubin, conjugated bilirubin, total bilirubin, newborn bilirubin screening

ABBREVIATIONS

BA—biliary atresia

LT—liver transplantation

DB—direct bilirubin

CB—conjugated bilirubin

HoL—hour(s) of life

TB—total bilirubin

BASM—biliary atresia splenic malformation

Drs Harpavat, Finegold, and Karpen designed the study, analyzed and interpreted the data, revised the article, and approved the final version for publication; Dr Harpavat acquired the data and wrote the original draft; and Dr Karpen initiated the idea and provided overall supervision for the project.

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