Letters to the Editor

Safe Bilirubin Level for Term Babies with Non-Hemolytic Jaundice

Management of jaundice in term newborn is a challenge to the clinician, who must attempt to balance the risk of under-treatment and over-treatment(l). The relation between bilirubin levels and brain damage was first systematically established in early 1950's, when studies showed that the risk of kernicterus in babies with hemolytic disease of newborn increased dramatically with bilirubin level and that exchange transfusion could markedly reduce that risk(l). In recent years, Western literature has recommended that in full term babies with non-hemolytic jaundice, serum bilirubin level of 25-29 mg/dl are safe and. do not require exchange transfusion(l). The present study evaluated the validity of this recommendation in our babies and attempted to find out the safe bilirubin level, if any.

Babies referred to Nehru Hospital. PGIMER, Chandigarh between January 1993 and June 1995 for severe jaundice formed the study sample. Kernicterus was diagnosed on the basis of standard clinical classification(2). Nonhemolytic jaundice was defined as no Rh or ABO incompatibility, negative direct Coomb's test, normal G6PD level, and normal Hb and reticulocyte count. Patients with incomplete investigations were excluded from the study. Chi square for linear trend was used for statistical analysis.

There were 350 babies of term gestation with severe jaundice and 36 (10.3%) of these had kernicterus at admission. Twenty eight (77.8%) of these 36 babies with kernicterus had no evidence of hemolysis. The mean (SD) birth weight (g) and gestation (wks) of babies with non-hemolytic kernicterus was 2551.79 g (±583.49) and 37.54 wks (±1.0), respectively. The corresponding values for non-hemolytic non-kernicteric babies were 2651.99 g (±538.78) and 37.45 wks (±0.90), respectively. Nine babies had stage 1 kernicterus, 12 had Stage II, 1 baby had Stage III kernicterus and in 6 babies it could not be classified. The serum bilirubin level was significantly higher in babies with non-hemolytic kernicterus than in those without kernicterus (26.05 mg/dl ±6.97 vs 19.26 mg/dl ±4.31; $p < 0.05$).

There was a significant linear trend between bilirubin level and incidence of kernicterus *(Table I).* Seven babies with kernicterus had bilirubin less than 20 mg/dl. Of these, 2 had birth asphyxia as risk factor and one presented on day one of life with rapid rise. Four babies presented late by which time the peak level of bilirubin had most likely passed.

Jaundiced babies having serum bilirubin level in danger zone should be treated by exchange transfusion. There is controversy in defining this danger level in term babies with no hemolysis(3). Recently, 25-29 mg/dl has been recommended as the cut off level for doing exchange transfusion in these babies(l). We found increasing incidence of kernicterus with increasing bilirubin level *(Table I).* The same phenomenon was noted earlier(4). Half of the babies with serum bilirubin ranging between bilirubin level of 26-30 mg/dl and only 9.8% of those with 20-25 mg/dl had kernicterus. By following the recommendations of cut-off of 25-29 mg/dl we would be exposing the babies with bilirubin level between 20-29 mg/dl to an unacceptably large risk of 1:10 to 1:2 of developing kernicterus.

As has been the experience of others,

TABLE I—*Incidence of Kernicterus in Non-hemolytic Jaundice.*

	Serum bilirubin (mg/dl)			
	<20	20-25	26-30	>30
Kernicterus	7	6	9	6
(OR)*	(1)	(2.3)	(21.3)	127.7)
No kernicterus	149	55	9	1

Chi-square for linear trend 56.5 ($p < 0.001$).
*OR -odds ratio for developing kernicterus.

we were unable to define a single safe bilirubin value for all babies as 4.4% of babies with bilirubin level of less than 20 mg/dl also had kernicterus. This is understandable as apart from bilirubin level *per se* many factors determine bilirubin toxicity.

There is a need to collect multicentric data from our country to define the risk of kernicterus with various levels of bilirubin and till such time, we recommend that we continue to follow serum bilirubin of 20 mg/dl as the cut off level for doing exchange transfusion in full term babies with non-hemolytic jaundice. This is in agreement with a subsequent view that the suggested change in cut-off level should be tested for its safety and efficacy before being accepted as new standard of therapy(5).

S.M. Dhaded,
Praveen Kumar,
Anil Narang,
Division of Neonatology, Department of Pediatrics, Post graduate Institute of Medical Education and Research, Chandigarh 160 012.

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