

Cord Albumin As a predictor for Neonatal Jaundice

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

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List of abbreviations

| | |
|-------------|--|
| AAP | American academy of pediatrics |
| ADCC | Antibody-dependent cell-mediated cytotoxicity |
| AHT | Allogenic hepatocyte transplantation |
| ASAP | As soon as possible |
| ATP | Adenosine triphosphate |
| B/A | Bilirubin /albumin |
| BAER | Brainstem Auditory Evoked Response |
| BBB | Blood Brain Barrier |
| BIND | Bilirubin –Induced neurologic Disorders Response |
| BP | Blood Pressure |
| CAR | Constitutive androstane receptor |
| CMV | Cytomegalovirus |
| CN-1 | Crigler-Najjar-Type-1 |
| CO | Carbon monoxide |
| CT | Computed tomography |
| DAT | Direct antiglobin test |
| DNA | Dineucleotide adenosine |
| DSP | Double surface phototherapy |
| DWI | Diffusion-weighted NMR imaging |
| ETCo | End Tidal Carbonmonoxid |
| FMH | Fetal-Maternal Hemorrhage |
| G6PD | Glucose-6-phosphate dehydrogenase deficiency |
| GST | Glutathione -S - transferase |
| HbF | Fetal hemoglobin |
| HDN | Hemolytic disease of the fetus and newborn |
| HO | Heme oxygenase |
| HS | Hereditary spherocytosis |
| IAT | Indirect Coombs' test |
| IgG | Immunoglobulin G |

List of Abbreviations

| | |
|---------------|--|
| IgM | Immunoglobulin M |
| IPT | intraperitoneal transfusion |
| IVC | Inferior vena cava |
| IVT | intravascular transfusion |
| IVIG | Intravenous Immunoglobulin |
| LBW | Low birth weight |
| LDH | Lactate dehydrogenase |
| LEDs | Light-emitting diodes |
| MRI | Magnetic Resonance imaging |
| NICHHD | National Institute of Child Health and Human Development |
| NMR | Nuclear magnetic resonance |
| NRBCs | Nucleated red blood cell |
| OD | Optical density |
| PK | Pyruvate kinase |
| PUBS | percutaneous umbilical blood sampling |
| RE | Reticulo endothelial system |
| Rh | Rhesus Factor |
| SLE | Systemic lupus erythematosis |
| TcB | Transcutaneous Bilirubin |
| TSB | Total Serum Bilirubin |
| UDPGT | Uridine diphosphate glucuronyl transferase |
| UVC | Umbilical vein catheter |
| XT | Exchange Transfusion |

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Abstract

Background: Neonatal hyperbilirubinemia defined as a total serum bilirubin level above 5 mg per dL (86 μ mol per L) is a frequently encountered problem. Although up to 60 percent of term newborns have clinical jaundice in the first week of life, few have significant underlying disease. However, hyperbilirubinemia in the newborn period can be associated with severe illnesses such as hemolytic diseases, metabolic and endocrinal disorders, anatomic abnormalities of the liver, and infections.

Objective: To determine the correlation between cord serum albumin and the development of neonatal hyperbilirubinemia.

Method: In present prospective study, 40 newborns were subjected to analysis of cord serum albumin and serum bilirubin at day3 and day5.

Results: Cord serum albumin has -ve correlation with neonatal hyperbilirubinemia.

Conclusion: Newborns with cord serum albumin $\leq 2.8\text{mg/dl}$ have increased risk of hyperbilirubinemia while newborns with cord serum albumin $\geq 3.3\text{mg/dl}$ have no risk of hyperbilirubinemia.

Introduction

Jaundice is one of the commonest problems that can occur in a newborn. Mostly it is physiological in the newborn because liver is not mature enough to handle the bilirubin .The neonates have about 1% of uridine diphosphoglucuronosyl transferase (UDPGT) activity as that of an adult (*Kawade and Onishi, 1981*).

Apart from this there is an increased load of bilirubin in neonates as they have a higher circulating erythrocyte volume, a shorter mean erythrocyte life and a larger early labeled bilirubin peak (*MacDonald et al., 2005*).

This hyperbilirubinemia is due to unconjugated bilirubin which is toxic to central nervous system. More than two thirds of all newborns appear jaundiced clinically because at some point during the first week of life almost every newborn has a total serum bilirubin (TSB) level of > 1 mg/dl, the upper limit of normal for an adult (0.2-1.2 mg/dl).

There are significant differences in TSB levels in different populations and it is difficult to define as normal or abnormal or obtain diagnostic and therapeutic cut off levels (*MacDonald et al., 2005*).

Introduction & Aim of the work

Defining a certain bilirubin level as physiological can be misleading and potentially dangerous. It is difficult to predict the course of bilirubinemia on day one of a neonate. There have been reports of cord blood bilirubin as predictor of hyperbilirubinemia that would require phototherapy (PT) (*Sun et al., 2007 and Suchonsker et al., 2004*).

Albumin is the major binding protein in the human neonate. Low production of albumin will lower its transport and binding capacity (*Sgro et al., 2006*).

Albumin binds to potentially toxic products like bilirubin and antibiotics. Bilirubin binds to albumin in an equimolar ratio. Free bilirubin is anticipated when the molar bilirubin- to- albumin (B: A) ratio is > 0.8 . It is the free bilirubin which can cross the blood brain barrier. There are no precise data to correlate a specific bilirubin value or albumin value with neurotoxicity (*Bunt et al., 2007*).

Aim of work

This study is designed to correlate serum cord albumin level with hyperbilirubinemia in neonates.