Cord Albumin As a predictor for Neonatal Jaundice

Thesis

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By

Ahmed Mohammed Elnahrawy

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Alexandria University

Under Supervision of

Prof. Dr. Osama Noor Eldin Saleh

Professor of Pediatrics

Faculty of Medicine - Ain Shams University

Dr. Rania Hamed Shatlaa

Lecturer of Pediatrics

Faculty of Medicine - Ain Shams University

Dr. Doaa Gamal Essaa

Lecturer of Clinical Pathology

Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
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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-wheighted 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

IgM	Immunoglobulin M
IPT	intraperitonial 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 µmol per L) is a frequently encountered problem. Although up to 60 percent of term newborns haveclinical 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$2.8mg/dl have increased risk of hyperbilirubinemia while newborns with cord serum albumin $\geq$ 3.3mg/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).***

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.