شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

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To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

CRITERIA FOR EXCHANGE TRANSFUSION IN JAUNDICED NEWBORNS

ESSAY

Submitted For partial Fulfilment
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Pediatrics

By

Ata Fathy Ahmed
M. B. B. ch

Supervised by

Prof. Dr.
Ahmed Khashaba
Prof. Of Pediatrics
Benha Faculty Of Medicine
Zagazig University

Dr.
Mohammed El Sherbini
Lecturer Of Pediatrics
Benha Faculty Of Medicine
Zagazig University

Benha Faculty of Medicine
Zagazig University
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TO MY FAMILY

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INTRODUCTION AND AIM OF WORK

Hyperbilirubinemia is probably the most common medical diagnosis in the newborn and is frequently found in infants prematurely.

Treatment is directed to avoid neurotoxicity caused by bilirubin specially kernicterus. *(Turkel et al., 1980).*

Bilirubin occurs in plasma in four forms:

(1) Unconjugated bilirubin; (2) free or unbound bilirubin (the form responsible for kernicterus, because it can cross cellmmbranes); (3) conjugated bilirubin (the only fraction to appear in urine) and (4) δ fraction (bilirubin covalenty bound to albumin) which appears in the serum when hepatic excretion of conjugated bilirubin is impaired in patients with hepato biliary disease. The δ fraction permits conjugated bilirubin to persist in the circulation and delays resolution of jaundice*(Behrman et al., 1996).*

The "free" bilirubin theory states that the risk of bilirubin neurotoxicity increases with increasing non albumin bound (unbound or free) bilirubin concentration because the free bilirubin concentration determines the distribution of bilirubin between the tissues (brain) and vascular space. The free bilirubin concentration is a function of both the albumin

concentration and total bilirubin concentration increasing as the bilirubin /albumin ratio increases *(Jacobsen, 1969).*

The "free" bilirubin theory is often misconstrued as implying that the unbound bilirubin is the "toxic" bilirubin fraction. As pointed out by ***Robinson and Rapoport, (1987)*** the theory proposes that the risk of bilirubin encephalopathly depends on both the total amount of bilirubin available (the miscible pool of bilirubin) as well as the tendency of bilirubin to enter the tissues (the unbound bilirubin concentration). They note that a high unbound bilirubin concentration might not lead to bilirubin neurotoxicity if the miscible pool of bilirubin is low.

At a contrast miscible bilirubin pool, the tissue bilirubin level and probability of bilirubin neurotoxicity varies inversely with the albumin concentrations.

The mathematical relationship between the dissociation constant (k) and molar concentrations of albumin, total bilirubin, and unbound bilirubin in the blood (assuming that nearly, all the bilirubin is bound to albumin and that there is a single bilirubin binding site per albumin molecule) is

$$\text{- Unbound bilirubin} \cong k \frac{\text{Total bilirubin}}{\text{Total albumin - Total bilirubin}}$$

The greater the bilirubin load, the higher the total and unbound bilirubin levels, tissue bilirubin level, and likelihood of

toxicity. The higher the albumin concentration at a specific bilirubin load, the higher the total serum bilirubin but the lower the tissue bilirubin concentration and likelihood toxicity. *(Odell, 1980).*

Blood exchange transfusion is awidely accepted therapeutic modality in the newborns. It is performed in neonatal jaundice to correct anemia and to prevent or correct hyperbilirubinemia that might lead to neurological sequelae. *(Cloherty, 1991).*

The indication of exchange transfusion should be individualized to some extent and might be based on a variety of criteria that include serum bilirubin concentration, albumin concentration and measurements of albumin binding of bilirubin. *(Lee, 1987).*

Acritical serum bilirubin concentration is typically used to decide when exchange transfusion should be performed, even though the magnitude of the serum bilirubin concentration is not aparticularly sensitive or specific predictor of bilirubin encephalopathy *(Watchko et al., 1992).*

The serum albumin concentration may contribute to the limited predictive value of the total bilirubin, because higher concentrations of albumin draw more the miscible pool of bilirubin into the vascular space, raising the serum bilirubin

concentration but lowering the likelihood of bilirubin toxicity *(Bratlid et al., 1990)*.

Although it has been recommended that albumin be given before exchange transfusion to move bilirubin from the tissues into the vascular space to improve the efficiency of the exchange, the serum albumin concentration itself is rarely used as acriterion for exchange transfusion *(Bryan et al., 1982)*.

Exchange transfusion could be recommended when either a critical total bilirubin concentration or critical bilirubin / albumin ratio is reached (whichever comes first) *(Ahlfors, 1994)*.

The aim of our work is to put bilirubin/albumin ratio side by side to total serum bilirubin concentration in deciding exchange transfusion in neonatal hyperbilirubinemia where exchange transfusion should be done when either a critical total serum bilirubin concentration or critical ratio is reached (whichever comes first).

LIST OF ABBREVIATIONS

ACD	:	Acid - Citrate - Dextrose
ADCC	:	Antibody - Dependent cell – Mediated Cytotoxicity
ADP	:	Adenosine Diphosphate
ATP	:	Adenosine Triphosphate
BCG	:	Brom Cresol Green
BCP	:	Brom Cresol Purpule
CMV	:	Cytomegalo Virus
CPD	:	Citrate - Phosphate - Dextrose
DIC	:	Disseminated Intravascular Coagulation
DNA	:	Deoxy Ribonucleic Acid.
ECG	:	Electro Cardiogram
FFA	:	Free Fatty Acids
FSH	:	Follicle –Stimulating Hormone.
G6PD	:	Glucose -6- Phosphate Dehydrogenase
G-SH	:	Glutathione In Reduced Form.
Hdiv IG	:	High Dose Intravenous Immune Globulin
IEM	:	Inborn Error of Metabolism
IQ	:	Intelligence Quotient
LH	:	Luteinizing Hormone
MMR vassine	:	Measles, Mumps & Rubella Vaccine
NADP	:	Nicotinamide Adenine Dinucleotide Phosphate

NOP	:	Nothing Per Oral.
PK	:	Pyruvate Kinase
RBC	:	Red Blood Cell
RDS	:	Respiratory Distress Syndrome
RH	:	Rhesus Factor
RID	:	Radial Immunodiffusion
RNA	:	Ribonucleic Acid
TSBL	:	Total Serum Bilirubin Level
UCB	:	Un conjugated Bilirubin
UDPGA	:	Uridine Diphosphate Glucuronic Acid
UDPGT	:	Uridine Diphosphate Glucuronyl Transferase
YAG	:	Yttrium - Aluminum - Garnet