EFFICACY OF INTRAVENOUS IMMUNOGLOBULIN IN Rh HEMOLYTIC ANEMIA OF NEWBORN

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قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ
الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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Dedication

I would like to thank my great mother and father for their love and care.

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List of Abbreviations

2,3-DBG .. 2,3-Diphosphoglycerate

AAP ..... American Academy of Pediatrics

ABE ..... Acute Bilirubin Encephalopathy

ALAT ..... Alanine Aminotransferase

ASAT ..... Aspartate Aminotransferase

ATP ..... Adenosine Triphosphate

BA ..... Biliary Atresia

BAER ..... Brain Stem Auditory Evoked Responses

BCR ..... B Cell Receptor

BIND ..... Bilirubin Induced Neurological Dysfunction

CBC ..... Complete Blood Count

CMOAT .. Canalicular Multispecific Organic Anion Transporter

CMV ..... Cytomegalovirus

CNSHA ... Chronic Nonspherocytic Hemolytic Anemia

CO ..... Carbon Monoxide

COPD ..... Chronoc Obstructive Pulmonary disease

DAT ..... Direct Antibody Test

ER ..... Endoplasmic Reticulum

ERCP ..... Endoscopic Retrograde Cholangiopancreatography

ETCO ..... End-Tidal Carbon Monoxide in Breath

FAB ..... Fragment Antigen Binding

FC ..... Fragment Crystallizable

G6PD ..... Glucose-6-Phosphate Dehydrogenase Deficiency

GGT ..... G-Glutamyltransferase

GST ..... Glutathione S-Transferases

HDN ..... Hemolytic disease of the newborn

HE ..... Hereditary Elliptocytosis

HIDA ..... Hepatoiminodiacetic acid

HPV ..... Human Papillomavirus

Ig G ..... Immunoglobulin G

IgA ..... Immunoglobulin A

IgD ..... Immunoglobulin D

IgE ..... Immunoglobulin E

IgM ..... Immunoglobulin M

ITP ..... Immune-Thrombocytopenic Purpura

IUGR ..... Intra Uterine Growth Retardation

IVIG ..... Intra Venous ImmunoGlobulin

LED ..... Light-Emitting Diode

MRI ..... Magnetic Rsonent Imaging

PK ..... Pyruvate Kinase

PUBS ..... Percutaneous Umbilical Blood Sampling

RDS ..... Respiratory Distress Syndrome

SGOT ..... Serum Glutamic Oxaloacetic Transaminase

SGPT ..... Serum Glutamic Pyruvic Transaminase

TCB ..... Transcutaneous Bilirubinometry

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INTRODUCTION

Neonatal jaundice is one of the commonly seen neonatal problems, as it affects 60% of full term infants and 80% of preterm infants in the first 3 days of birth. Although transient, the condition account for up to 75% of hospital readmission in the first week after birth **(Kristin Melton et al., 1999).**

Neonatal jaundice secondary to isoimmune hemolytic anemia (Rh, ABO incompatibility) is a cause of high serum bilirubin level due to hemolysis of RBCs secondary to transplacental passage of antibodies. This lead to increased risk of acute bilirubin encephalopathy and kernicterus **(Borgard et al., 2006).**

Hemolytic anemia is an alloimmune condition that develops in a fetus when IgG molecules that has been produced by the mother and has passed through the placenta; attack the red blood cells in the fetal circulation. The red cells are broken down and the fetus develop anemia **(Aher et al., 2008).**

Hemolysis leads to elevated bilirubin levels and symptoms of jaundice increase within 24 hours after birth. Like any other severe neonatal jaundice, there is a possibility of acute or chronic kernicterus **(Kirk, 2008).**

One of the causes of hemolytic disease of the newborn is the Rh disease. This occur in a Rh positive baby blood group born to a Rh negative mother blood group **(Smits-Wintjens et al., 2008).**

The use of anti-D prophylaxis in Rhesus negative women has led to a marked decline in Rhesus sensitization and hemolytic disease of the newborn. However sensitization can occur despite anti-D immunoglobulin particularly if it is given too late or in insufficient dose after a large feto-maternal hemorrhage. Many patients in developing countries do not receive Rh prophylaxis due to inadequate care or inability to afford anti-D immunoglobulin **(Cortey et al., 2006).**

Exchange transfusion is sometimes needed beside the conventional therapy (phototherapy) as it corrects anemia associated with hemolysis and is effective in removing sensitized red blood cells before they are hemolyzed. It also removes about 60% of bilirubin from the plasma, resulting in a clearance of about 30 to 40 % of total bilirubin as it equilibrates with extravascular tissues. Exchange transfusion is not without risk. It carries a 5% risk of major morbidity and the risks associated with blood exposure, infants receiving exchange transfusion have increased risks of infection, NEC acidosis, hypocalcaemia, electrolyte abnormalities and air embolism **(Kristin Melton et al., 1999).**

In recent years, intravenous immunoglobulins (IVIG) have been successfully used in isoimmune hemolytic anemia (Rh-ABO incompatibility) **(Miqdad et al., 2004).**

IVIG was found to decrease hemolysis leading to reduction in serum bilirubin level. The immunoglobulin could act by occupying the FC receptors of reticuloendothelial cells preventing them from taking up and lysing antibody coated RBCs **(Mundy, 2005).**