CORRELATION BETWEEN COVERED SKIN TRANSCUTANEOUS BILIRUBIN ESTIMATION AND SERUM BILIRUBIN MEASUREMENT DURING AND AFTER PHOTOTHERAPY

Thesis

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بسم الله الرحمن الرحيم
وأنزل الله عليك
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وعلّمك ما لم تكن
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Contents

List of Abbreviations

AAP	: American Academy of Pediatrics
B/A	: Bilirubin/Albumin
BBB	: Blood brain barrier
CMV	: Cytomegalovirus
CO	: Carbon Monoxide
DAT	: Direct antibody test
ETCO	: End-Tidal Carbon Monoxide Concentration
G6PD	: Glucose 6-phosphate dehydrogenase deficiency
HDN	: Hemolytic disease of Newborn
IAT	: Indirect antiglobulin test
JM	: Jaundice meter
LED	: Light emitting diode
MRP2	: Canalicular multi-drug-resistance- associated transport protein
NRBCs	: Nucleated red blood cells
PCV	: Peak Corpuscular Volume
PDA	: Patent ductus arteriosus
PTH	: Phototherapy
RCT	: Randomized Controlled Trial
SBRs	: Serum bilirubins
TcB	: Transcutaneous bilirubin
TORCH.	: Toxoplasma, Rubella, Cytomegalovirus, Herpes simplex, Human immunodeficiency virus
TSB	: Total serum bilirubin
UDPGT	: Uridine diphosphoglucuronate transferase
UGT1A1	: Uridine diphosphoglucuronosyl transferase 1A1
UTI	: Urinary tract infection

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Introduction

Neonatal hyperbilirubinemia (NHB) occurs in two-thirds of term and late preterm infants ***(Bhutani et al., 2000).***

Management of NHB has become more challenging because newborn infants are discharged early and unreliable post-discharge follow-up increases the risk of severe NHB and even bilirubin encephalopathy in these infants ***(Maisels and Newman, 1998).***

Although TSB measurement is reliable, it is a painful and time-consuming procedure. Bilirubin levels before and during phototherapy (PHT) are measured as TSB and obtained by heel-stick or venous blood draws. Noninvasive transcutaneous bilirubin (TcB) estimation using newer bilirubinometer devices has been shown to be easy, safe, accurate, time-effective and painless ***(Bhutani et al., 2000).***

Rubaltelli et al., showed close correlation between TcB measured by BiliCheck, high-performance liquid chromatography and routine laboratory bilirubin measurement independent of race, birth weight and post-natal age ***(Rubaltelli et al., 2001).***

Although TcB correlates well with TSB, bilirubin in the skin exposed to PHT is modified and significantly affects TcB. Thus, TcB cannot be used as a surrogate measure of TSB when the infant is receiving PHT ***(Varvarigou et al., 2009).***

Preliminary studies suggest that by covering the skin during PHT, more accurate approximations of serum bilirubin can be made with TcB measurements ***(Ozkan et al., 2003).***

Aim of the Work

The aim of the study was to evaluate the accuracy of transcutaneous bilirubin measurement from the covered and uncovered skin during and after phototherapy treatment and compare these values with total serum bilirubin performed at the same time.