

# Trans-Cutaneous Bilirubinometry versus Serum Bilirubin in Neonatal Jaundice

Manoochehr Mahram<sup>1</sup>, Sonia Oveisi<sup>2</sup>, and Najmeh Jaberi<sup>3</sup>

<sup>1</sup> Department of Pediatrics, Children Growth Research Center, Qazvin University of Medical Science, Qazvin, Iran

<sup>2</sup> Department of Community of Medicine, Metabolic Diseases Research Center,  
Qazvin University of Medical Sciences, Qazvin, Iran

<sup>3</sup> School of Medicine, Qazvin University of Medical Science, Qazvin, Iran

Received: 22 Jan. 2014; Accepted: 23 Oct. 2014

**Abstract-** Hyperbilirubinemia is a common problem in neonates and causes serious complications. Thus, serial measurements of bilirubin should be done. This assessment is done through two methods of laboratory measurement in serum sample and transcutaneous bilirubinometer. This descriptive study compared transcutaneous bilirubin assessment and laboratory serum bilirubin. Bilirubin level was assessed among 256 neonates admitted to the Qods Children's Hospital in Qazvin- Iran, because of neonatal indirect jaundice, through two methods of transcutaneous bilirubinometry from two sites of forehead and sternum and laboratory measurement of bilirubin in serum. The cases were non-hemolytic icteric term neonates weighing 2500 gram or more and had not received phototherapy or other treatments. Neonates with hemolytic forms of jaundice, sepsis and suspicious to metabolic disorders were excluded. Assessments by means of KJ-8000 transcutaneous bilirubinometer from two sites of forehead and sternum and through laboratory measurement of serum bilirubin were registered and analyzed. The results of the current study showed that there was a correlation of 0.82 between serum bilirubin and transcutaneous forehead bilirubin assessment and for the used device sensitivity of 0.844; specificity of 0.842, Youden Index of 0.709 and Shortest of 0.042 for a cut-off of 12.4 in bilirubin of participants. Furthermore, Likelihood Ratio positive and negative (LR) were 5.665 and 0.164, respectively and diagnostic Odds Ratio (LR+/LR-) was 34.56. Transcutaneous bilirubinometry can be considered as a reliable tool to assess bilirubin for the screening of neonatal jaundice in term neonates.

© 2015 Tehran University of Medical Sciences. All rights reserved.

*Acta Med Iran* 2015;53(12):764-769.

**Keywords:** Neonatal Jaundice; Transcutaneous bilirubinometry; Bilirubin; Sensitivity; Specificity

## Introduction

Hyperbilirubinemia is a common and in most cases benign problem in neonates. Jaundice is observed during the first week of life in approximately 60 percent of term infants and 80 percent of preterm infants. Hyperbilirubinemia itself does not have any harm for the body unless exceeds a level which leads to kernicterus, or bilirubin encephalopathy, that is a neurologic syndrome resulting from the deposition of unconjugated (indirect) bilirubin in the basal ganglia and brainstem nuclei. Reliable estimates of the frequency of the clinical syndrome are not available because of the wide spectrum of manifestations. Overt neurologic signs have a grave prognosis; more than 75% of infants die, and 80% of affected survivors have

bilateral choreoathetosis with involuntary muscle spasms. Mental retardation, deafness, and spastic quadriplegia are common. The precise blood level above which indirect-reacting bilirubin or free bilirubin will be toxic for an individual infant is unpredictable and the duration of exposure to high bilirubin levels needed to produce toxic effects is unknown (1).

To prevent this complication and to do appropriate management such as blood exchange or phototherapy as soon as possible, all susceptible neonates with jaundice are checked for serum level of bilirubin. Once this check-up is merely as a screening test and in some cases with near-critical levels, serial measurements should be done. Besides the traditional method of measurement of Total Serum Bilirubin (TSB) level, today, non-invasive techniques for Transcutaneous Measurement of

**Corresponding Author:** S. Oveisi

Department of Community of Medicine, Metabolic Diseases Research Center, Qazvin University of Medical Sciences, Qazvin, Iran  
Tel: +98 912 5042401, Fax: +98 281 3326033, E-mail address: soveisi@razi.tums.ac.ir