

# **Nurses' Knowledge and Practice regarding Care given for Neonates with Hyperbilirubinemia**

**Protocol**

Submitted for Partial Fulfillment of Master  
Degree in Pediatric Nursing

**By**

**Hoda Ragab Mohamed**

(B.Sc. Nursing)

Faculty of Nursing, Ain Shams University

**(2003)**

**Under Supervision**

**Assist. Prof. Dr./ Iman Ibrahim Abd El-Moneim**

Assist. Prof. of Pediatric Nursing

Faculty of Nursing

Ain Shams University

**Dr./ Madiha Amin Morsy**

Lecturer of Pediatric Nursing

Faculty of Nursing

Ain Shams University

Faculty of Nursing  
Ain Shams University  
**2007**

# Introduction

Jaundice is a common finding in healthy and diseased neonates. Because of early discharge, the risk of kernicterus is a re-emerging problem in the United States. Precise and accurate determination of plasma total bilirubin concentrations is the indispensable prerequisite for proper management of jaundiced infants (*Rolinsk et al., 2005*).

Jaundice in the newborn or neonatal hyperbilirubinemia, is a common problem. It encompasses neonates with physiological jaundice, breast milk jaundice and non-physiological jaundice. In the United States, for example, 65% of all newborn infants appear jaundiced during the first week of life. A Survey of government hospitals and health centres under the Ministry of Health Malaysia in 1998, found that about 75% of newborns were jaundiced in the first week of life (*Ministry of Health Malaysia, 1998*).

In 1994, the American Academy of Pediatrics (AAP) published a clinical practice guideline for a common and potentially serious problem—the management of hyperbilirubinemia in healthy term newborns (*American Academy of Pediatrics, 1994*). The AAP is currently updating their practice guideline on the evaluation and treatment of hyperbilirubinemia in newborns based on research evidence. Unfortunately, publishing the guideline alone has not changed the way many pediatricians practice (*American Academy of Pediatrics, 2001; Newman et al., 1999*).

Meeting the needs of the newborn with hyperbilirubinemia is not simple. The differential risk for newborns who are breastfed and who are in high-risk demographic and socioeconomic groups must be

reflected in plans for follow-up care. The system of care must detect rapid shifts in newborn physiology. A bilirubin of 8 to 10 mg/dL is unremarkable in a 48-hour-old newborn but signifies the need for urgent intervention in one who is 12 hours old (*Bhutani et al., 1999*).

The neonate has the right to quality nursing care. Nurses are key members of the neonatal care team and play a vital role in the delivery of quality neonatal services (*Lefrak and Porter, 2004*).

## **Aim of the work**

This study aimed to assess the care given by nurses for neonates with hyperbilirubinemia through:

- Assess knowledge and practice of nurses regarding care of neonates with hyperbilirubinemia.

# Subjects and Methods

## Research design

A descriptive design.

## Settings:

This study will be conducted at Neonatal Intensive Care Units (NICU) affiliated to different Health Sectors

- 1- Private sector: Cleopatra Hospital
- 2- Health Insurance: Nasr City
- 3- Curative Agency: Dar El Shefa.
- 4- University Hospitals: Ain Shams Maternity & Children' Hospitals.
- 5- Ministry of Health: Manshiat El Bakery Hospital.

## Subjects

The subjects will include all nurses working in all neonatal care units in the previously mentioned settings.

## Tools of data collection:

The data will be collected through using the following:

### 1- A predesigning Questionnaire sheet

The researcher will develop it after reviewing relevant literature. It will be written in simple Arabic language and will include the following data.

**Part (I):** Demographic characteristics of nurses such as age, level of education, years of experience, attendance of previous training programs.....etc.

**Part (II):** Characteristics of the neonates such as gestational age, gender, weight, ethnic group, type of disease ...etc.

**Part (III):** Knowledge about the disease as definition, risk factors, type of disease, clinical manifestations, complications, treatment and nursing care

## **2. An observation checklist:**

To assess nursing care provided by the nurses of neonates with hyperbilirbinemia such as (phototherapy. Blood transfusion, .....).

### **Operation design:**

- The researcher will be reviewing the related references to be acquainted with various aspect of the problem.
- **Written approval consent** will be obtained from the directors of Healthy Ministry Hospitals' in Cairo Governorate in which of the study will be conducted.
- **A pilot study** will be conducted to evaluate the content of the tools, the obtained results will help determine whether the questions were clear to nurses and if there is any necessary modifications of the tools.
- **Fieldwork:** The study will be conducted for 3 days/week over 6 month's period; the researcher will be available two days weekly during morning shift to collect data. The questions sheet will be distributed to all nurses in the previously mentioned settings to fill it. The researcher will observe the actual nursing care given to neonates with hyperbilirubinemia.

## **Results**

Results will be tabulated and presented in tables.

## **Discussion of the results**

Discussion of obtained data will be done based on current related literature.

## **Conclusion and recommendations**

It will be derived from the results of the study

## **Summary**

### **Arabic summary**

## REFERENCES

- American Academy of Pediatrics (1994):** Provisional Committee for Quality Improvement. Practice parameter: management of hyperbilirubinemia in the healthy term newborn. *Pediatrics*. 94: 558-565.
- American Academy of Pediatrics (2001):** Subcommittee on Neonatal Hyperbilirubinemia. Neonatal Jaundice and Kernicterus. *Pediatrics*. 108: 763-765.
- Bhutani, V. K., Johnson, L.H. & Sivieri, E. M. (1999):** Predictive ability of a pre-discharge hour-specific serum bilirubin for subsequent significant hyperbilirubinemia in health term and near-term newborns. *Pediatrics*, 103: 6-14.
- Lefrak, L. and Porter, M. (2004):** The National Conference of Neonatal Nursing. San Francisco.
- Ministry of Health Malaysia (1998):** A study of neonatal Jaundice in Kelantan, Malaysia. *Mal. J. Med. Scien* 2(1): 69-71.
- Newman, T. B.; Escobar, G. J., Gonzalez, V. M., Armstrong, M. A., Gardner, M. N., & Folck, B. F. (1999):** Frequency of neonatal bilirubin testing and hyperbilirubinemia in a large health maintenance organization. *Pediatrics*. 104: 1198-1203.
- Rolinski B.; Okorodudu A.O.; Kost G., Roser M.; Wu J.; Goerlach-G.A. and Kuester H. (2005):** Evaluation of Total Bilirubin Determination in Neonatal Whole Blood Samples by Multiwavelength Photometry on the Roche OMNI S point of Care Analyzer. *Point of Care: The Journal of Near –patient Testing & Technology*. 4(1): 3-8.



## INTRODUCTION

Hyperbilirubinemia is a common disorder occurring in both term and preterm infants. It's generally a benign, self-limiting process, but if not properly monitored and treated, it can result in permanent neurologic damage. For these reasons, nurses should understand the differences between physiologic and nonphysiologic hyperbilirubinemia and the associated risk factors and treatment (**Parker, 2010**).

The term hyperbilirubinemia refers to an excessive level of accumulated bilirubin in the blood and is characterized by jaundice, or icterus, a yellowish discoloration of skin and other organs. Hyperbilirubinemia is a common finding in the newborn and in most instances is relatively benign. However, in extreme cases, it can indicate a pathologic state. Hyperbilirubinemia may result from increased unconjugated or conjugated bilirubin. The unconjugated form is the type most commonly seen in newborn (**Hockenberry & Wilson, 2007**).

Neonatal hyperbilirubinemia is a common problem. Approximately 60-70% of term infants and 80% of preterm infants develop jaundice in the first week of life. Incidence is higher in populations living at higher altitudes. Incidence also varies with ethnicity. It is lower in Africans Americans and higher in East Asians, Greeks living in Greece, and American Indians (**Gomella et al., 2009**).

Nurses play an integral role in the implementation of universal screening for elevated bilirubin levels in the newborn. Nurses should assess the family's level of understanding and discourage behaviors that are not recommended such as the administration of supplemental water. In addition, facilities and health care providers should promote and support breastfeeding as successful breastfeeding helps to decrease elevated bilirubin levels (**Association of Women's Health, Obstetric & Neonatal Nurses [AWHONN], 2005**).

The nurse plays a critical role in identifying the newborn at risk, providing parent education and support, and providing nursing care to the newborn undergoing treatment for hyperbilirubinemia; the nurse coordinates communication among all members of the newborn's care team, including physicians, laboratory personnel, and parents (**Ball & Bindler, 2006**).

## **AIM OF THE STUDY**

This study aimed to assess the care given by nurses for neonates with hyperbilirubinemia through assessing knowledge and practice of nurses regarding to care of neonates with hyperbilirubinemia.

## **REVIEW OF LITERATURE**

### **Definition of Neonatal Hyperbilirubinemia:**

Hyperbilirubinemia is defined as an excess amount of bilirubin in the blood and results in a yellow discoloration of the skin (**Smitherman et al., 2006**). Hyperbilirubinemia is a TSB level above 5 mg/dl resulting from unconjugated bilirubin being deposited in the skin and mucous membranes (**Mattson & Smith, 2004**).

The term jaundice originated from the French word *jaune*, which means yellow. Jaundice, or icterus from the Greek "icteros", refers to the yellow discoloration of the skin, sclerae and other tissues caused by deposition of unconjugated bilirubin pigment (**Wyllie & Hyams, 2006**). Jaundice is a yellowish coloration of the skin and sclera of the eyes that develops from the deposit of yellow pigment bilirubin in lipid/fat containing tissues (**Davidson et al., 2008**).

### **Incidence of neonatal hyperbilirubinemia:**

Jaundice develops in 60-70% of the approximately 4 million infants born each year in the United States. In those born prematurely, the incidence probably exceeds 80% (**Madan et al., 2005**). Nonetheless, each year approximately 1% of all term infants born in the United States are hospitalized in the first 2 weeks of life for the treatment of hyperbilirubinemia. This accounts for more than half of all readmissions in the first month of life and considerable health care expenditures (**Volpe, 2008**).

According to the prevalence from Cairo University Children Hospital at Monira (Abou El-Reesh), the admission rate of high risk neonates to the NICU in 2007 was 1089 baby, and neonatal jaundice (NJ) constitutes 61.6%. Exchange blood transfusion was done in 208 newborns for neonatal hyperbilirubinemia representing 19.1% of total number of NICU admission and 30.1% of total number of jaundiced patients (**Ebrahim, 2009**). In a study done by **Seoud et al. (2007)** about NJ in the NICU in Egypt, they found that the incidence of neonatal hyperbilirubinemia 38.2% and exchange transfusion was done in 22.5% of the jaundiced babies (**Seoud et al., 2007**).

### **Ethnic variations and jaundice**

East Asian infants (Japanese, Chinese, and Filipino ethnic groups) have a higher occurrence of hyperbilirubinemia than Caucasian infants. Infants with Asian fathers and Caucasian mothers have a higher incidence of jaundice than if both parents are Caucasians. Other ethnic groups at risk for increased bilirubinemia are Navajo, Eskimo, and Sioux Native American newborns; Greek newborns; Sephardic-Jewish (oriental ancestry) newborns; and some Hispanic newborns (**Ladewig et al., 2006**).

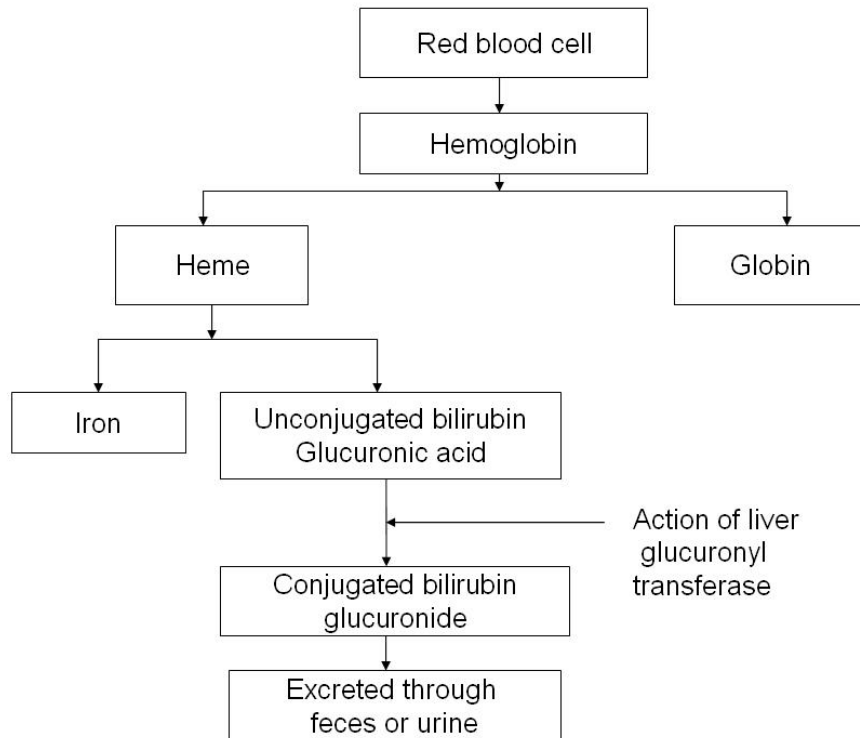
## **Pathophysiology of Neonatal Hyperbilirubinemia:**

Bilirubin is one of the breakdown products of the hemoglobin that results from RBC destruction. When RBCs are destroyed, the breakdown products are released into the circulation, where the hemoglobin splits into two fractions, heme and globin. The globin (protein) portion is used by the body, and the heme portion is converted to unconjugated bilirubin, an insoluble substance bound to albumin (**Hockenberry & Wilson, 2007**).

The bilirubin in the liver is detached from the albumin molecule and, in the presence of the enzyme glucuronyl transferase, is conjugated with glucuronic acid to produce a highly soluble substance, conjugated bilirubin, which is then excreted into the bile (**Wong et al., 2003**).

The direct bilirubin is excreted into biliary tract system that carries the bile into the duodenum. Bilirubin is converted to urobilinogen and stercobilinogen within the duodenum by the action of the bacterial flora. Urobilinogen is excreted in urine and feces; stercobilinogen is excreted in the feces. Figure (1) shows the formation and excretion of bilirubin (**Alden, 2006**).

Normally, the body is able to maintain a balance between the destruction of RBCs and the use or excretion of by-products. However, when developmental limitations or a pathologic process interferes with this balance, bilirubin accumulates in the tissues to produce jaundice (**Dixon, 2004**).

**Figure (1):** Formation and excretion of bilirubin

Adopted from: **Hockenberry M.J. & Wilson D. (2007):** Wong's nursing care of infants and children, (8th ed.). Elsevier Mosby Company: Canada, p. 319.

### **Risk Factors for Neonatal Hyperbilirubinemia:**

There is wide range of factors that affect neonatal bilirubin level. However, infants without identified risk factors rarely have TSB levels above 12 mg/dl (205  $\mu$ mol/l). As the number of risk factors increases, the potential to develop markedly elevated bilirubin levels also increase (**Stoll & Kliegman, 2004**).