



Efficacy of the Use of White Reflecting Curtains during The Phototherapy in Neonatal Jaundice

Thesis

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List of Abbreviation

CB	Conjugated bilirubin
Co	Carbon monoxide
Fe	Iron
FFT	Free fatty acids
G6PD	Glucose 6 phosphate dehydrogenase
Hb	Hemoglobin
LED	Light emitting diode Red blood cells
ROS	Reactive oxygen species
RBC's	Red blood cells
UCB	Unconjugated bilirubin
UDPG-T	Uridine diphosphate glucoronyl transferase enzyme
UV	ultra violet

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Abstract

Background: Jaundice is the most common condition that requires medical attention in newborns, especially in developing countries. In most infants, unconjugated hyperbilirubinemia reflects a normal transitional phenomenon. However, in some infants, serum bilirubin levels may excessively rise, which can be cause for concern because unconjugated bilirubin is neurotoxic and can cause death in newborns and lifelong neurologic sequelae in infants who survive (kernicterus). For these reasons, the presence of neonatal jaundice frequently results in diagnostic evaluation.

The aim of the study: Was to compare the efficacy of using single phototherapy without curtains and that of using single phototherapy with white curtains hanging from the three sides of the phototherapy unit. In addition to assess the safety of the second method clinically and laboratory.

Design: This study was conducted over a period of 12 months from 1/4/2007 to 1/4/2008 in Omm El Atebba hospital (Neonatal Intensive Care unit), the design was divided into three stages,

Screening stage : During which preparation and classification of the sample into cases (study group $n=41$) and (control groups $n=38$).

Intervention stage : During which cases will use single phototherapy with white reflecting curtains.

Follow up stage: During which the efficacy of the usage of the phototherapy with curtains was assessed.

Results: The mean (standard deviation) decrease in total serum bilirubin levels after 4 hours of phototherapy was significantly ($p<0.001$) higher in the study group (1.097 mg/dl) than in the control group (0.19 mg/dl). Also Kaplan –Maier statistics shows the probability of the duration of phototherapy among the study group 52 hours and the control group 90 hours. No difference in adverse events was noted in terms of hyperthermia or hypothermia, weight loss, rash, loose stools.

Conclusion: Hanging white curtains around phototherapy units significantly increases efficacy of phototherapy in the treatment of neonatal jaundice without evidence of increased adverse effects.

Introduction

Jaundice is the most common condition that requires medical attention in newborns. The yellow coloration of the skin and sclera in newborns with jaundice is the result of accumulation of unconjugated bilirubin. In most infants, unconjugated hyperbilirubinemia reflects a normal transitional phenomenon. However, in some infants, serum bilirubin levels may excessively rise, which can be cause for concern because unconjugated bilirubin is neurotoxic and can cause death in newborns and lifelong neurologic sequelae in infants who survive (kernicterus)For these reasons, the presence of neonatal jaundice frequently results in diagnostic evaluation .

(Thor WR Hansen,2009)

Neonatal jaundice is effectively treated with phototherapy .Bear in mind when initiating phototherapy that lowering of the total serum bilirubin concentration is only part of the therapeutic benefits.Since photoisomers,by virtue of their water soluble nature,should not be able to cross the blood brain barrier,phototherapy reduces the risk of bilirubin induced neurotoxicity as soon as the lights are turned on.At any given total serum bilirubin concentration,the presence of 20-25% of photoisomers means that only 75-80% of the total bilirubin is present in a form that can enter the brain.

. *(Thor WR Hansen,2009)*

Generally, phototherapy is very safe,and it may have no serious long term effects in neonates.,however the following adverse effects and complications have been noted as insensible water loss may occur

,phototherapy may be associated with loose stool,Increased fecal water loss may create need for fluid supplementation,Hypocalcemia appears to be more under phototherapy light especially in preterm which is mediated by melatonin metabolism **(Kaplan .,etal 2006)**

Multiple phototherapy units are sometimes used to increase the light intensity and thus improve the efficacy of phototherapy.**(Sarici ,et al 2000)**

Approches to obtain the maximum possible effect and use from each phototherapy unit.Thus,**De Carvalho et al in 1999** showed that intensive phototherapy could be provided by a locally made unit using day light fluorescent phototherapy lamps instead of much more expensive blue lamps. Similarly if it could be proved that single phototherapy with low cost reflecting curtains is more effective than single phototherapy alone,it might be a valuable alternative to double phototherapy in the treatment of infants with jaundice **(SDjokomuljanto,B S Quah,et al 2006)**

This may translate into potential cost reduction in two ways. Firstly, as the shorter duration of treatment means that more patients can be treated with fewer phototherapy units, there will be a cost saving in terms of acquisition and maintenance of phototherapy units. Secondly, decreasing the duration of phototherapy should translate into a shorter length of hospitalisation. this would also mean considerably less separation from the mother and less interruption of breast feeding. These advantages would indeed be of major importance in developing nations

(SDjokomuljanto,B S Quah,et al 2006)

Aim of the study

The study aims to:

1. Compare the efficacy of using (single phototherapy without curtains) and that of using (single phototherapy with white curtains hanging from the three sides of the phototherapy units)
2. Asses the safety of the second method.

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Aim of the study

The study aims to:

Compare the efficacy of using single phototherapy without curtains and that of using single phototherapy with white curtains hanging from the three sides of the phototherapy units through comparing the decline rate of the serum level of bilirubin in the two conditions