



Full length article

Effects of baby massage on neonatal jaundice in healthy Iranian infants: A pilot study

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ABSTRACT

Objective: To evaluate the effects of baby massage on transcutaneous bilirubin levels and stool frequency of healthy term newborns.

Methods: This Pilot study was conducted on 50 healthy newborns in Valiasr Hospital of IKHC. The infants were randomly allocated to two treatment (massage) and control group. The massage group received massage therapy (according to Touch Therapy) for four days from the first day postnatal while the control group received routine care. Main variable studied were transcutaneous bilirubin level (TCB) and stool frequency which were compared in two groups.

Results: There were 50 newborns in the study 25 in each group (50%). There was a significant difference in the TCB levels between two groups ($p = 0.000$) with those in the massage group having lower bilirubin levels. As for the stool frequency there was a significant difference in two groups on the first day showing more defecation in the control group ($p = 0.042$) which on the consequent days was not significant and the frequencies were almost similar.

Conclusion: Massage group had a lower transcutaneous bilirubin levels compared to the control group, thus, these pilot results indicate that massaging the newborns can be accompanied by a lower bilirubin level in the healthy term newborn.

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1. Introduction

Neonatal jaundice is a common physiological condition in newborns with more than 50% of term and 80% of preterm neonates showing clinical signs such as yellow discoloration of the skin and sclera resulting from high serum levels of bilirubin (Maisels, Bhutani, Bogen, Newman, Stark, et al., 2009; Cohen, 2006; Scrafford et al., 2013) It is estimated that almost two thirds of newborns will appear clinically jaundiced during their first weeks of life (Schwartz, Haberman, & Ruddy, 2011).

Neonatal hyperbilirubinemia results from an increased production of bilirubin in infants and their limited ability to excrete it (Dennerly, Seidman, & Stevenson, 2001). Infants produce more bilirubin than adults because they have red blood cells with higher turnover and shorter half-life (Brouillard, 1974).

The above limitations lead to physiologic jaundice which is high serum bilirubin concentration in the first week of life followed by a decline in the next week, however these levels might increase and give rise to pathologic jaundice that prompts

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early treatment. Sufficiently elevated levels of bilirubin can lead to bilirubin encephalopathy and subsequent kernicterus with a permanent neurologic deficit and developmental disorders ([Hyperbilirubinemia, 1994](#)). Incidence of hyperbilirubinemia is higher in Asians than in whites, and that can be partly environmental and partly genetics ([Click et al., 2013](#)). There are several risk factors that are known to be associated with hyperbilirubinemia namely sex, birthweight, ABO incompatibility, premature birth, infection, cephalhematoma, G6PD (glucose 6 phosphate dehydrogenase deficiency), many genetic mutations altering enzyme functions, breastfeeding patterns, primiparity and difficulty feeding. Unique relationships observed includes warmer air temperatures, oil massage and ethnicity ([Scrafford et al., 2013](#); [Chen et al., 2011](#))

Newborns are discharged from the hospital within 24–48 h afterbirth that leads to fewer diagnoses of jaundice. The most reported cases for newborn readmission has been the need for phototherapy or blood exchange transfusion as a result of hyperbilirubinemia ([Click et al., 2013](#); [Maisels & McDonagh, 2008](#)). Many treatments are available for this condition including phototherapy or blood exchange transfusion. Newer guidelines on diagnosis and treatment of neonatal jaundice have also emerged pharmacologic treatments and have focused on increasing use of transcutaneous measurement of bilirubin (TCB) as a diagnostic tool ([Schwartz et al., 2011](#)). Although these treatments have been proven to control the condition, as any other treatment they might have potential adverse effects such as diarrhea, skin rash, blue baby syndrome for phototherapy ([Ip et al., 2004](#)). Moreover the need for treatment and admission lead to mother–infant separation and causes emotional distress for both. Therefore, preventing newborn jaundice is a necessary step in avoiding the harmful consequences.

There are however several interventions that are being widely used to prevent severe hyperbilirubinemia, by either reducing enterohepatic bilirubin or inhibiting its production. Baby massage is proven to be an effective method. In many areas of the world massaging the infant is a common practice. There have been numerous studies on the effects of baby massage over the past decades which have demonstrated many benefits such as weight and length gain, bone mineral density increasing, better sleep, elimination and reduction of colic, it has also been associated with reduced infant stress, better physiological and behavioral response, decreasing hospital stay and providing an intervention that allows parents to take active role ([Click et al., 2013](#); [Field, 2002](#); [Field, Diego, & Hernandez-Reif, 2010](#); [Hernandez-Reif, Diego, & Field, 2007](#)). Based on some clinical investigations massage promotes defecation and thus bilirubin excretion, that can reduce neonatal jaundice. We therefore conducted a clinical trial to study the effects of baby massage on neonatal jaundice in healthy infants ([Chen et al., 2011](#)).

2. Materials and methods

2.1. Participants

Participants were healthy term infants born at Valiasr Hospital of Imam Khomeini Hospital Complex, Tehran, Iran from January 2014 to January 2015.

Inclusion criteria for the study were (1) Gestational age of 37–41 weeks, (2) Birth weight of 2800–3600 g, (3) Apgar score of 8–10 and (4) Not having the hemolytic condition, asphyxia, or other conditions requiring treatment. All the neonates were breast fed during the whole study period.

A sum of 55 newborns were enrolled and were randomly allocated to a control group, and a treatment group, any infant requiring phototherapy for jaundice was excluded from the study. Finally, there were 25 neonates in the control group and 25 in the treatment group.

2.2. Procedure

For the treatment group, a specialized trained midwife would explain the study purposes and would teach the mother the massage method based on Touch Therapy ([Field et al., 1986](#)). The mother was taught to massage the child for 15–20 min three times a day from the first day to the fourth day postnatal. The method was as follow:

After washing hands thoroughly and applying baby oil, the mother would start the massage by gently touching the skin, starting from the face the mother would apply a little pressure with 2 fingers on the forehead cheeks and orbital areas, the moving to the chest she would put 2 fingers sliding transversally to each side, then the abdomen was massaged by circular moves from right to left and moving down to the limbs extending and flexing the upper and lower limbs and finally massaging the back by gently pressuring the vertebrae and the two sides slowly moving downwards.

Neonatal routine care was given to the control group.

2.3. Measures

2.3.1. Stool frequency

Stool frequency was recorded from the first day to the fourth day postnatal by the mother and was documented in the notes.

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