Effectiveness of position change among infants during phototherapy in management of hyperbilirubinemia in late preterm and term neonate

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ABSTRACT
Neonatal jaundice is the yellowish staining of the white part of the eyes and skin in an infant because of high bilirubin levels. Untimely children have a lot higher occurrence of neonatal jaundice requiring remedial mediation than term infant. The present study aims to assess the effectiveness of position change among infants during phototherapy in the management of hyperbilirubinemia in late preterm and term neonate. A quantitative approach with a quasi-experimental design with non-randomized control research design was used to conduct the study in Thiruvallur District Head Quarter Government Hospital. Thirty samples were selected by using a convenience sampling technique and were grouped into an experimental and control group; each consist of 15 samples. A semi-structured questionnaire was used to collect information regarding demographic variables and variables related to clinical proforma. Bilirubin level was monitored and recorded in the hyperbilirubinemia chart for both the groups. The neonates in the experimental group were subjected to a position change for every 2 hrs and the neonates in the control group were given regular care. The study results show that position change among infants during phototherapy was found to be effective in the reduction of serum bilirubin level considerably among infants in the experimental group than the infants in the control group. At the level of p<0.001. This indicates that position change is effective in reducing the bilirubin level and have an impact on the early recovery of the neonates.

INTRODUCTION
A baby whose birth weight <2500 gms paying little mind to their gestational age is called low birth weight babies. Decrease infant and child mortality is a significant objective of the technique to accomplish well-being for all. The significant commitment of baby passing is by children which are a genuine worry since almost 5 million neonates die every year globally of which 96% are in the developing nations, a successful decrease of such high neonatal demise rate stays a significant worldwide test in the 21st century (Jagadeeswari et al., 2020). Neonatal jaundice is the yellowish staining of the white part of the eyes and skin in an infant because of high bilirubin levels. Different indications may incorporate abundance lethargy or helpless taking care of side effects may incorporate seizures, cerebral paralysis or kernicterus (Bhutani, 2011). Neonatal jaundice is the commonest unusual discovery during the initial seven days of life. Neonatal hyperbilirubinemia is a huge reason for neonatal morbidity and prolonga-
tion of medical clinic remain, which thus builds the odds of sepsis and mortality in the infant time frame. Jaundice is the commonest usual actual discovering during the primary seven day stretch of life. Hyperbilirubinemia is perceived as clinical jaundice in roughly 20-half of full-term and 80% of preterm children. Distinguishing proof of the danger factors and ideal discovery and ideal administration of NNH are in this manner significant to forestall cerebral harm and ensuing neuromotor retardation because of bilirubin encephalopathy (Luca et al., 2009).

Untimely infants have a lot higher occurrence of neonatal jaundice requiring restorative mediation than term infant. Youngsters with untreated, extreme hyperbilirubinemia (characterized as serum complete bilirubin level >20mg/dL) can create indications of intense bilirubin encephalopathy. If not treated promptly, they may proceed to create Kernicterus, a persistent, neurologically obliterating condition because of bilirubin toxicity (Maisels and McDonagh, 2008). As per UNICEF, In India occurrence of NNH, shifted from 4.3% to 6.5% of all live conceived infants. As of late rate of huge hyperbilirubinemia is recorded as 10.5% in term live conceived children and 25.3% in close to term gathering. Rate of NNH is 16.67% of all live conceived infants in our clinic which has a yearly conveyance rate of roughly 4000 (Han et al., 2015).

The purpose of the study [1] To assess the level of bilirubin among infants during phototherapy in the experimental and control group.[2] To assess the effectiveness of position change among infants during phototherapy. [3] To find the association of post-test level of bilirubin among infants with selected demographic variables.

MATERIALS AND METHODS

A quantitative approach with a quasi-experimental design with non randomized control research design was used to conduct the study in Tiruvallur District HeadQuarter Government Hospital. Thirty samples were selected using a convenience sampling technique. The criteria for sample selection are late-term and term neonates with hyperbilirubinemia and undergoes phototherapy, mothers who are willing to participate in the study and neonates with bilirubin level 5 to 10 mg/dl. The exclusion criteria for the samples are mothers who are not willing to participate in the study, neonates who do not have hyperbilirubinemia, preterm neonate, neonates with RDS and other neurological problems and neonates with bilirubin level more than 10 mg/dl.

The data collection period was done with prior permission from the medical officer. The purpose of the study was explained to the mothers and written informed consent was obtained from them. A semi-structured questionnaire was used to collect information regarding demographic variables and variables related to clinical profoma. Bilirubin level was monitored and recorded in the hyperbilirubinemia chart for both the groups. The neonates in the experimental group were subjected to a position change
Table 1: Level of bilirubin among infants during phototherapy among neonates N = 30 (15+15).

| Group        | Test   | Normal | Mild | Moderate | Severe |
|--------------|--------|--------|------|----------|--------|
|              | No     | %      | No   | %        | No     |
| Experimental| Pretest| 0      | 0    | 15       | 100.0  |
|              | Post-test| 7  | 46.67| 8       | 53.33  |
| Control      | Pretest| 0      | 0    | 15       | 100.0  |
|              | Post-test| 3  | 20.0 | 12      | 80.0   |

Table 2: Effectiveness of position change among infants during phototherapy in the management of hyperbilirubinemia N = 30 (15+15).

| Group            | Pretest Mean | SD | Post Test Mean | SD | Paired 't' test value |
|------------------|--------------|----|---------------|----|-----------------------|
| Experimental Group| 7.97         | 1.41| 5.95          | 1.41| t = 23.407 p = 0.0001 S*** |
| Control Group    | 7.84         | 1.39| 6.53          | 1.56| t = 9.543 p = 0.0001 S*** |

for every 2 hrs and the neonates in the control group were given regular care. At the end of every day, the bilirubin level was monitored and recorded for a week. The data were analyzed using descriptive and inferential statistics.

RESULTS AND DISCUSSION

Sample characteristics

The present study shows that in the experimental group, most of the newborns 7(46.6%) were in the age group of 4 to 7 days, 10(66.7%) were born by vaginal delivery, 8(53.3%) were weighing 2 to 2.5 Kg, 6(40%) were in the gestational age group of 32 to 36 weeks and ≥37 weeks respectively, 8(53.3%) were preterm, 10(66.7%) had direct breastfeeding, 8(53.3%) had a serum bilirubin level of 5 to 8mg/dl, 15(100%) had physiological jaundice, had 2 to 4 hours of phototherapy and had a position change during phototherapy.

Level of bilirubin among infants during phototherapy among neonates

The results show that in the pretest of the experimental group, most of the newborns 15(50%) had mild jaundice. Whereas in the post-test, 8(53.33%) had mild jaundice and 7(46.67%) were normal. It also portrays that in the pretest of a control group, all the newborns 15(50%) had mild jaundice. Whereas in the post-test, 12(80%) had mild jaundice and 3(20%) were normal Table 1.

The current examination is upheld by Brits et al. directed an examination on Infants Position during phototherapy on serum bilirubin. Position changing of the newborn children during traditional phototherapy for hyperbilirubinemia is utilized in numerous medical clinics. In a randomized clinical preliminary 40 term embittered youngsters who
were admitted to the neonatal ward of Mofid Children Hospital. No measurably huge contrasts in TSB following 24 hours were seen between two gatherings. Be that as it may, a decline in TSB was essentially connected with position change. Diminishing in serum bilirubin level was more prominent in newborn children with position change following 24 hours. As indicated by results changing the situation of term newborn children with hyperbilirubinemia during phototherapy could build the adequacy of this treatment (Fakhraee et al., 2011).

The study shows that none of the demographic variables had shown statistically significant association with posttest level of bilirubin level among infants during phototherapy in the interventional gathering.

CONCLUSIONS

This indicates that position change is effective in reducing the bilirubin level and have an impact on the early recovery of the neonates. Early recovery helps to reduce hospitalization that in turn, prevents nosocomial infection.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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