

“Phototherapy -A Life Saving Strategy for Preterm Babies”

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ABSTRACT

It is the best way to protect the new-born from jaundice by uses of light. Jaundice generally appears due to presence of higher than normal level of bilirubin in blood. Phototherapy has been considered as best way to protect the child from jaundice and millions of babies have benefited from phototherapy. Side effects are rare and it is generally considered a simple, safe and cheap procedure. Phototherapy is a treatment where the exposure of skin to a light source converts unconjugated bilirubin molecules into water soluble isomers that can be excreted by the usual pathways. Blue-green light is most effective for phototherapy as it both penetrates the skin and is absorbed by bilirubin to have the photochemical effect.

Key words: Phototherapy, Side effects, bilirubin

1 Definition

- It is called as treatment of child with use light. Phototherapy is a treatment where the exposure of skin to a light source takes place and these light sources convert the UN conjugated bilirubin molecules into water soluble isomers then these molecules are excreted by the usual pathways. Blue-green light is most effective for phototherapy as it both penetrates the skin and is absorbed by bilirubin to have the photochemical effect.
- When baby is placed under a source of blue- green (wave length 425 to 550 nm) light reacts with bilirubin in the blood flowing through the baby's skin
- It is the treatment of a disorder, especially of the skin, by exposure to light, including ultraviolet and infrared radiation, also known as light treatment.



2 Purpose

1. To prevent brain damage (kernicterus)
2. To make the standard procedure for treating the patient with jaundice.
3. To treat hyper bilirubinemia or neonatal jaundice
4. The purpose of phototherapy is to convert the bilirubin to lumirubin to correct hyper bilireubinemia. Bilirubin which is water insoluble is converted to substances like lumirubin which is water soluble and hence easily excreted through urine.

3 Indication for phototherapy

1. Phototherapy should be started when the total serum bilirubin level is at or above 15 mg/dl in infants (35 to 48 hours old), 18 mg/dl in infants (49 to 72 hours old) and 20 mg/dl in infants with hyper bilirubinemia have serious underlying pathology.
2. Jaundice is considered pathologic if it presents within the first 24 hours soon after birth & the total serum bilirubin level rises by more than 5 mg/dl per day or is higher than 17 mg/dl or infant has sign and symptoms suggestive of serious illness. The management goals are to exclude pathologic causes of hyper bilierubemnia and initiate treatment to prevent bilirubin neurotoxicity

4 Contraindications

1. The concomitant use of photosensitizing medications,
2. A family history of congenital prophyria
3. Infants with cholestasis jaundice

5 Types of phototherapy

- Phototherapy unit: - There are following types of phototherapy;
- Conventional phototherapy
- Fibre optic phototherapy
- Bilirubin blanket
- Bili blanket: - These can be given in two ways
- Single sided (one sided)
- Double sided (two sided)

Equipments:

1. Phototherapy unit
2. Eye shield/cover
3. Nappy(small)
4. Tungsten-halogen lamps
5. Fluorescent tubes
6. Fiberoptic systems
7. Gallium nitride led lights
8. Sterile gauze and cotton.

6 Procedure

1. Explain the need and procedure of phototherapy to the parents.
2. Gathered all the required articles at bed side and make sure that all articles should be in working condition. Specially check the working of lights before commencing phototherapy.
3. Wash hands properly with soap.
4. Measure the baby's temperature before commencing phototherapy and record it.
5. Any obvious cream or oil residue visible on the baby's skin should be gently Wiped off using cotton wool and water
6. Remove all of the baby's clothing except for the nappy before commencing Phototherapy
7. Place infant on warmer or in bassinet with diaper on and eye protection in place.
8. Eye protection pads are the preferred option for protecting a baby's eyes from the phototherapy
9. Position phototherapy device at bedside with lights set at recommended distance from the infant.
10. Turn on the phototherapy lights.
11. The overhead light should be positioned at around 45cm (18 inches)
12. Direct light towards the infant with exposure of maximal surface area. If halogen spotlights are used, more than one light may be required to cover the entire infant with light. This is typically done with one light directed at the chest and head, with the second directed at the abdomen and legs.
13. Monitor and record the baby's temperature at least every 3 hours- (more frequently if required)
14. Measure the spectral irradiance of the phototherapy setup with a commercially available radiometer in several areas over the surface of the infant and average the results.

15. Intermittently repeat measurements of the spectral irradiance and maintain the lights in the proper position.
16. Baby has to be kept on continues observation.
17. Replace all the used equipment and send for the sterilization.
18. Documents the procedure in the case file.

7 Complications

- Increased insensible water loss.
- diarrhoea
- Decreased serum calcium level in preterm
- Retinal damage
- Erythema
- Skin rash
- Direct hyper bilirubinemia who are exposed to phototherapy may experience a dark, gray-brown discoloration of the skin, commonly known as "bronze-baby syndrome."

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