

### A Review Paper on Ultra- Violet (UV) Light Treatment on Jaundice in Newborn Babies

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**Abstract** – Jaundice is a condition that can occur in newborns, within 2-3 days of birth. Jaundice is actually a yellowing of the skin or whites of the eyes'. This is caused by elevated bilirubin levels in the newborn's blood. Jaundice normally appears first on the face and then will move down the body to the chest, abdomen, arms, and legs. Phototherapy- Phototherapy is a light that helps break down the bilirubin in the baby's skin. If a baby is still in the hospital or is readmitted to the hospital, Phototherapy may be administered by placing the baby in a special warmer surrounded by these lights. Efficacy of phototherapy depends on the type of light-source, the intensity of light and the area of skin exposed.

*KeyWords*: Phototherapy,Ultraviolet Light, UV LEDs, Florescent Lamp, Jaundice, bilirubin, journals

#### 1. INTRODUCTION

Phototherapy is the use of Ultraviolet Light (UV) for reducing the concentration of bilirubin in the body of infants. Although it has become a mainstay since its introduction in 1958, a better understanding of the efficacy and safety of phototherapy applications seems to be necessary for improved clinical practices and outcomes. This study was initiated to evaluate workers' exposure to Optical Radiation from different types of phototherapy devices in clinical use in Italy. Photo degradation of bilirubin in vivo has been investigated by using green fluorescent sources according to the suggestions obtained in a previous study in vitro. Two groups of 50 jaundiced low-birth-weight infants were exposed to fluorescent light in phototherapy units under similar irradiant conditions. One group was exposed for 24 h to standard green tubes, the other, to daylight lamps. Newborns of the two groups were similar for gestational age, birthweight, and initial bilirubin concentration. A greater decrease in the serum concentration of bilirubin was found in subjects exposed to the green light when compared with infants exposed to daylight lamps. The use of green light is strongly suggested instead of the white, blue, and special blue lamps, because of the real efficiency, power and range of wave lengths.

Commercially available phototherapy systems include those that deliver UV light via fluorescent bulbs, halogen quartz lamps, light-emitting diodes, and fiber optic mattresses. Proper nursing care enhances the effectiveness of phototherapy and minimizes complications. Caregiver responsibilities include ensuring effective irradiance delivery, maximizing skin exposure, providing eye protection and eye care, carefully monitoring thermoregulation, maintaining adequate hydration, promoting elimination, and supporting parent-infant interaction.

### 2. UV LIGHT & ITS TYPES

Ultraviolet (UV) is a form of electromagnetic radiation with wavelength from 100 nm (with a corresponding frequency of approximately 30 PHz) to 400 nm (750 THz), shorter than that of visible light but longer than X-rays. UV radiation is present in sunlight, and constitutes about 10% of the total electromagnetic radiation output from the Sun.



Fig -1: Electromagnetic Spectrum of Light

Sr No	UV Light with wavelength in (nm)	Source	% of UV light Reaches on Earth Surface	Side Effect on Human Body
1	UV – A 315 nm to 400 nm	Sun	95%	<ol> <li>1) Skin Cancer</li> <li>2) Sun spot on skin</li> <li>3) Skin Wrinkles</li> </ol>
2	UV – B 280 nm to 315 nm	Sun	5%	<ol> <li>1) Skin aging</li> <li>2) Skin Tanning</li> <li>&amp; Burning</li> <li>3) Damage DNA</li> <li>in Skin cells</li> </ol>
3	UV – C 100 nm to 280 nm	Sun	0% Absorb by Ozone layer	<ol> <li>Able to penetrate the skin and causes</li> <li>Deep Sun Burn</li> <li>Eye irritation</li> </ol>

Table -1: UV Light side Effect on Human body

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Sr No	UV Light with wavelength in (nm)	UV Light Generation by Alternative Source	Applications
1	UV – A 315 nm to 400 nm	1) Arc Welding Torches 2) Mercury lamps 3) UV	<ul><li>Curing</li><li>Printing</li><li>Lithography</li><li>Medical Applications</li></ul>
2	UV – B 280 nm to 315 nm	bulbs 4)Xenon Lamp 5)Fiber lasers 6) GaN Based Laser Diodes 7) IR Laser LEDs 8) UV LEDs	<ul> <li>Phototherapy</li> <li>Curing</li> <li>Tinning</li> <li>Protein Analysis</li> <li>DNA sequencing</li> </ul>
3	UV – C 100 nm to 280 nm	of UV LEDS	<ul> <li>Disinfection</li> <li>Medical Applications</li> </ul>

 Table -2: UV Light use in Medical Application

## 3. UV LIGHT USED IN JAUNDICE IN NEWBORN BABY

Sr No	UV Light	Range	Light Intensity	Remark
1	1) Blue-light fluorescent phototherapy 2) Blue- light- emitting diodes	430 to 490 nm	470 nm	Blue LED lights have a narrow spectral band of high-intensity light that overlaps the absorption spectrum of bilirubin.

 Table -3: UV Blue Light used in Jaundice of Newborn Baby

### 4. JANDUICE BLOOD TEST (BILIRUBIN) FOR UV LIGHT TREATMENT

Sr No	Bilirubin Tes Blood Test of I	Domont	
Sr NU	Normal Value (mg/dL)	Critical Value (mg/dL)	кешагк
1	0.8 to 12.0	> 12.0	Phototherapy (UV Light) Treatment Required in critical Condition

Table -4: UV Light Treatment Table

# 5. JANDUICE PHOTOTERPY TRETEMTN IMGES



Fig -2: Blue LED UV Light Sources.



Fig -3: Blue LED UV Light Treatment.

### **3. CONCLUSIONS**

The Blue LED UV Light Treatment that is Phototherapy treatment is most effective & Less Costly treatment for the new born babies. The recovery rate is fast as compare to conventional methods. This treatment is easy and can be used to all age group patients also.

### REFERENCES

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