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Research Article

**FREQUENCY OF NEONATAL HYPERBILIRUBINEMIA AND  
ITS OUTCOME AFTER TREATMENT****Dr. Abdul Rehman Siyal<sup>1\*</sup>, Dr. Khalid Yousuf Memon<sup>2</sup>, Dr. Hemandas<sup>3</sup>, Munawar Ali  
Kalhoro<sup>4</sup>**<sup>1</sup> MBBS, DCH, MD, Assistant professor, Paediatrics Department LUMHS<sup>2</sup> MBBS, DCP, (MPhil haematology) Lecturer pathology department LUMHS<sup>3</sup> MBBS, (FCPS) Paediatrics department Isra University<sup>4</sup> PhD scholar institute of biochemistry university of Sindh jamshoro

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**Abstract:****Objective:** The objective of this study was to find out the prevalence and outcome after treatment of in neonatal hyperbilirubinemia.**Material & Methods:** This descriptive study was conducted in the department of LUMH. Total 558 patients were admitted in the nursery of paed, out of them 144 had hyperbilirubinemia. All the neonates having hyperbilirubinemia were included in the study after taking verbal informed consent from their parents. All the data was recorded regarding gender, type of treatment received and outcome.**Results:** Neonatal hyperbilirubinemia was found in 144(20.43%) out of 558 neonates. Males were 77(67.54%) while females were 37(32.45%), with male to female ratio as 2.08:1. Regarding treatment 54% neonates received phototherapy while 46% neonates received exchange transfusion + phototherapy. When neonates were observed for complications of treatment in 2(1.75%) neonates developed anemia those were underwent phototherapy, while among neonates those were given exchange transfusion + phototherapy they developed skin rashes in 2(1.75%) neonates and 2(1.75%) had diarrhea. After treatment 80(70.17%) neonates became improved, 15(13.15%) were discharged on their own wish, 11(9.64%) lost follow up and 08(7.01%) were died.**Conclusion:** We concluded that neonatal hyperbilirubinemia prevalent as 20.43%. Male newborn were more effective. Phototherapy and exchange transfusion+Phototherapy both are effective treatments for neonatal jaundice with very low rate of complications.**Keywords:** Hyperbilirubinemia, newborn, treatment.**Corresponding author:****Dr. Abdul Rehman Siyal,**

Paeds department of LUH Hyderabad

Cell # 03313-2851728

Email: [ar\\_drsiyal@yahoo.com](mailto:ar_drsiyal@yahoo.com)

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**INTRODUCTION:**

Excessively raised level of bilirubin is very toxic for developing brain in neonates and therefore its management remains challenging for pediatricians [1]. Some degree of neonatal jaundice is a benign, transitional phenomenon that affects 60%–80% of newborns worldwide [2]. Encephalopathy due to raised bilirubin can be prevented by early detection of the neonates at risk of developing hyperbilirubinemia and by prompt management of this condition [3]. Neonatal hyperbilirubinemia is one of the most important clinical conditions which need immediate attention [4]. It mostly affects the neonates in the neonatal period especially in the first few weeks of their life [5,6]. About 8-11% of neonates develop jaundice. Hyperbilirubinemia is considered when total bilirubin level is raised more than 95th percentile for age [7,8] in the first week of their life. Idiopathic neonatal jaundice is found in about 60-80% of healthy infants [9]. Due to raised level of bilirubin skin and sclera color changes to yellow [10]. That is why, it may result in anxiety in parents and physician. According to the report of National Neonatal-Perinatal Database (NNPD) frequency of neonatal jaundice was found to be 3.3% in house live births while morbidity because of hyperbilirubinemia is 22.1% [11] in extramural admissions. In newborn jaundice is first observed in the skin of face and when its level is raised, it is also noted easily on the body and extremities. This is commonly observed in the 50-60% of infants in their first week of life [11]. Various factors affect neonatal jaundice like gestation age at birth, weight of newborn, maternal infections, premature rupture of fetal membranes etc [12]. Commonest risk factors responsible for raised bilirubin level in neonates are pre term, foetomaternal blood group incompatibility, cephalhematomas and birth trauma due to instrumental delivery i.e either by using forceps or by vacuum. Delay in passage of meconium is also important risk factor. In the initial few weeks of newborn, strict monitoring should be done if any risk factor is present. There are various types of hyperbilirubinemia in newborns for, eg, physiological jaundice, Jaundice due to various pathologies, jaundice because of mother feeding and hemolytic jaundice. Causes of hemolytic jaundice are ABO blood group incompatibility, Rh factor incompatibility, and Jaundice due to with Glucose-6-phosphate dehydrogenase (G6PD) deficiency [13]. Various treatment options for neonatal jaundice are available which includes phototherapy, exchange transfusion and pharmacological agents. Pharmacological treatment includes intravenous immunoglobulins (IVIG), phenobarbitone, metalloporphyrins and follow up remedies [14]. Phototherapy is given in form of blue wavelengths of light to change unconjugated bilirubin in the skin.

The bilirubin is then converted to its less toxic water-soluble photoisomers which is then excreted in the urine and bile without conjugation. The decision to start phototherapy depends on the age of newborn and level of total serum bilirubin. In some neonates, jaundice become severe enough, typically with total plasma/serum bilirubin (TSB)  $\geq 20\text{mg/dL}$  or  $342\mu\text{mol/L}$ , which results in immediate hospitalization for phototherapy and/or exchange transfusion (ET) to stop further progression to acute bilirubin encephalopathy (ABE) or kernicterus in newborn which is serious complication leading to morbidity and mortality.<sup>15</sup> To our knowledge few studies are conducted on frequency and treatment of neonatal hyperbilirubinemia in our set up, therefore has been conducted to find out the prevalence and treatment outcome of neonatal hyperbilirubinemia.

**MATERIAL & METHODS:**

This was descriptive study and was carried out in pediatric department of LUH Jamshoro/Hyderabad. Total 558 patients were admitted in the nursery of paed, out of them 144 had hyperbilirubinemia. All neonates delivered at Liaquat University Hospital labor room by NVD, LSCS, and referred cases from different hospital; clinics from Hyderabad city were also included. All the neonates having SB of  $< 12\text{mg/dl}$  and neonates having jaundice but expired before treatment were excluded from the study. A detailed medical history and complete clinical examination were done. These babies were also observed for maintenance of body temperature and dehydration. Those babies who were hypothermic were kept in incubator with continuous phototherapy. After admission all the routine laboratory investigations including detailed history regarding jaundice and its duration were evaluated. All the routine laboratory investigations including complete blood picture, blood grouping, Rh factor, Serum Bilirubin (direct, indirect), urine C/S, ultrasound Abdomen and X-ray chest were carried out. Relative information was gathered regarding gender, type of treatment received, its complication etc. All the data was entered on self-made proforma and was analyzed using SPSS version 16.

**RESULTS:**

In our study total admissions were 588, out of these hyperbilirubinemia was found in 144 (20.43%) of neonates. **Fig: 1**

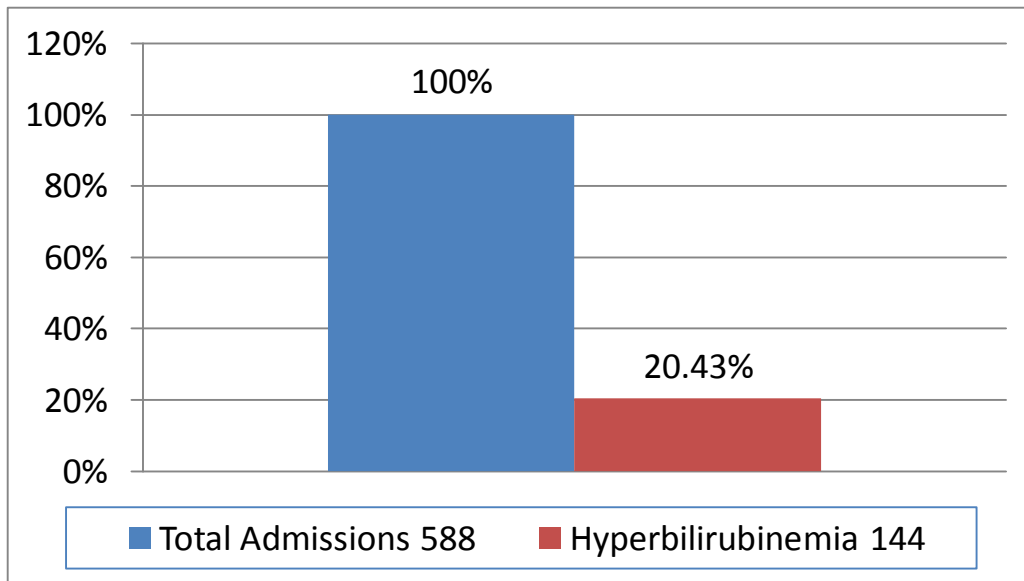
Majority were males i.e. males were 77 (67.54%) while females were 37 (32.45%). The ratio of male to female was 2.08:1. **Table:1**

Regarding treatment, 54% neonates were underwent phototherapy while 46% neonates were underwent exchange transfusion + phototherapy. **Fig 2**

When neonates were observed for complications of treatment, anemia was developed in 2 (1.75%) neonates those were underwent phototherapy, while

among neonates who were given exchange transfusion along with phototherapy, 2(1.75%) developed skin rashes and 1.75% had diarrhea.  
**Table:2**

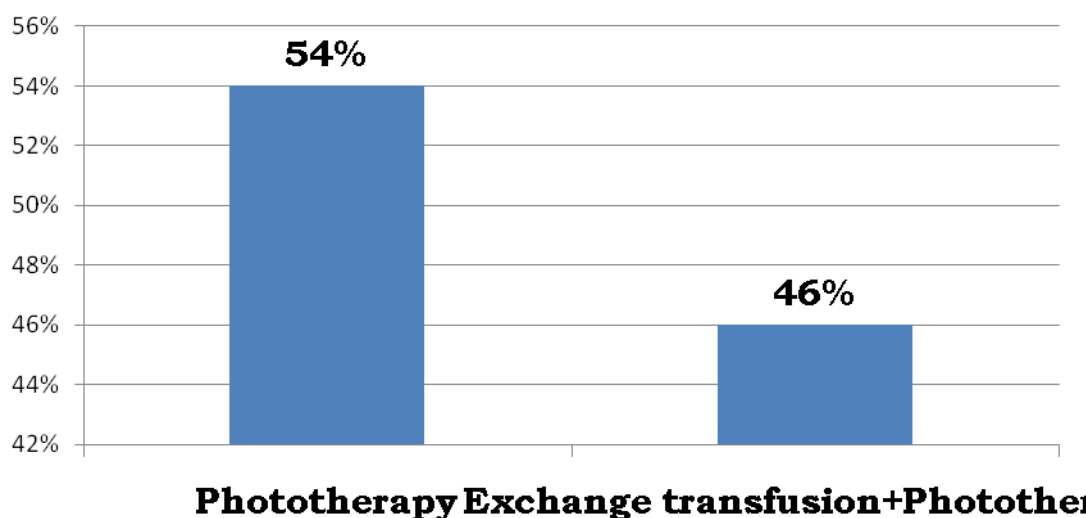
After treatment 80(70.17%) neonates became improved, 15(13.15%) were discharged on their own wish, 11(9.64%) lost follow up and 08(7.01%) were died. **TABLE:3**



**FIG: 1. INCIDENCE OF NEONATAL HYPERBILIRUBINEMIA n=588**

**TABLE: 1.GENDER DISTRIBUTION ACCORDING TO NEONATAL HYPERBILIRUBINEMIA**

Gender	Frequency (%)
Gender	
Male	77(67.54%)
Female	37(32.45%)
Male to female ratio	2.08:1



**FIG:2 NEONATAL DISTRIBUTIONS ACCORDING TO TREATMENT**

TABLE: 2. TREATMENT COMPLICATIONS

Treatment complications	Frequency (%)
Phototherapy Anemia	02(1.75%)
Exchange Transfusion+Phototherapy	
Skin rashes	03(2.63%)
Diarrhea	02(1.75%)

TABLE: 3. OUTCOME OF NEONATAL HYPERBILIRUBINEMIA AFTER TREATMENT

Treatment	Frequency(%)
Improved	80(70.17%)
Discharged their own wish	15(13.15%)
Not in follow up	11(9.64%)
Mortality	08(7.01%)

**DISCUSSION:**

In our study neonatal hyperbilirubinemia was found in 144(20.43%) of neonates. Similarly Najib K et al<sup>16</sup> reported in the discussion the prevalence of the severe neonatal hyperbilirubinemia was 15%, and more found in males. FOK et al<sup>16</sup> mentioned that hyperbilirubinemia had 23.9% prevalence in China. In our study, males were 67.54% while females were 32.45%, with male to female ratio was 2.08:1. In comparison to our results Tioseco JA et al[18] also reported in their results that male babies were more suffering from neonatal hyperbilirubinemia as compare to females. Various studies conducted in the past also favor the findings of our study but some do not support this relationship [19]. Although it was thought that Y –chromosome is responsible for this increase risk of hyperbilirubinemia in males which leads to increase morbidity and mortality especially in pre term neonates[20]. Results of our study showed that 54% neonates received phototherapy while 46% neonates received exchange transfusion along with phototherapy. Phototherapy is found to be effective if bilirubin level is not much raised. In phototherapy light is absorbed through skin which converts the unconjugated bilirubin into bilirubin photoproducts which is than easily excreted through urine and stool. Guidelines has been published by American Academy of Pediatrics[21] for the commencing of phototherapy. After starting phototherapy, rate at

which serum bilirubin level decreases is different, but 6% to 20% decrease is expected [21]. Phototherapy can be continued in term newborns if there is no evidence of hemolysis until total serum bilirubin level is reached up to 13 to 14 mg per dL. Those newborns don't need to remain in hospital, instead they can be followed up in OPD [22,23].

In our study when neonates were observed for complications of treatment anemia was developed in 2(1.75%) neonates those were underwent phototherapy, while among those who were treated by exchange transfusion + phototherapy, had developed skin rashes in 2(1.75%) neonates and 2(1.75%) had developed diarrhea. In comparison to our results, Aspberg et al and others[24-27] also observed that Phototherapy has short- and long-term adverse effects

In this study after treatment 80(70.17%) neonates became improved, 15(13.15%) were discharged on their own wish, 11(9.64%) lost follow up and 08(7.01%) die. Study conducted by Emokpae AA et al [28] also found that infants with hyperbilirubinemia account for a significant proportion of neonatal admissions and their results showed that incidence of acute bilirubin encephalopathy (ABE) and exchange transfusion (ET) were 17.0% and 31.5% respectively and a total of 61 of the jaundiced infants died in their study.

**ONCLUSION:**

We concluded that neonatal hyperbilirubinemia prevalent as 20.43%. Male newborn were more frequent as compare to female. Phototherapy and exchange transfusion+ Phototherapy both are effective in the treatment of neonatal jaundice with very low rate of complications.

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