FREQUENCY OF HYPOCALCEMIA AND INDIRECT HYPERBILIRUBINEMIA IN PRETERM BABIES REMAIN ADMITTED IN INDEPENDENT UNIVERSITY HOSPITAL.

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ABSTRACT… Premature birth and low-birth weight are major causes of neonatal mortality, occurrence is 29%. Complications of prematurity and its risk factors are comparatively lesser in late preterm babies. Preterm babies are at higher risk of development of Bronchopulmonary dysplasia, intraventricular hemorrhage, necrotizing enterocolitis, retinopathy of prematurity, patent ductus arteriosus sepsis, hypothermia, hypoglycemia, hypocalcaemia, and hyperbilirubinemia. No recent and current reliable data is available regarding frequency of hyperbilirubinemia and metabolic abnormalities in very preterm babies. Early detection of hyper-bilirubinemia, hypoglycemia and hypocalcaemia can help in better management and decrease neonatal morbidity and mortality. **Objectives:** To determine the frequency of hyper-bilirubinemia and metabolic abnormalities in very preterm babies. **Study Design:** Cross sectional study. **Setting:** Neonatology department, Independent University Hospital, Faisalabad. **Period:** 14th June 2016 to 13th July 2017. **Material & Methods:** 120 very preterm singleton babies born between 28–34 weeks gestation, without lethal congenital anomalies and birth weight > 500 gram presenting in neonatal emergency within first 24 hours of birth were included. Neonates born to mothers with diabetes mellitus, addiction, renal failure, hemoglubinopathies, Rh negative blood group along with neonates with toxemia, congenital pneumonia, congenital malformation, or any genetic syndrome were excluded. **Results:** Mean gestational age was 31 ± 1.4weeks. Male patients were dominant (52%) than the females (48%). Hyperbilirubinemia, hypoglycemia and hypocalcemia was present in 68(57%), 27(22.5%) and 23(19%) patients respectively. **Conclusion:** Hyperbilirubinemia and metabolic abnormalities are common in very preterm babies and by knowing the magnitude of these problems early preventive measure can be acquired to reduce the neonatal mortality and morbidity

Key word: Hyperbilirubinemia, Hypoglycemia and Hypocalcemia, Preterm.

INTRODUCTION

Low birth weight and prematurity is a major factor contributing in neonatal mortality 28% cases. Incidence of prematurity among newborns is about 23%.[1] In china preterm birth rate is 13.6 million most of them die during curly neonatal period due to fatal complication 72 % of neonatal mortality is due to prematurity.[2]

World health organization define prematurity as any delivery before 37 wks of gestations, New born between 32 – 37 wks are late preterm and 28 to 32 wks are very preterm and before 28 wks as extreme preterm babies.[3,4]

Risk of complications increase with decreasing gestational age very and extreme preterm are more prone to complications like respiratory distress syndrome and necrotizing enterocalitis. Hyperbilirubinemia[5] and metabolic abnormalities are putting lot of burden on nurseries and cost to parents, society and health sectors.[6,7]

This study is designed for early detection of hyperbilirubinemia and metabolic abnormalities for better and improved management and outcome in preterm babies.

Direct complications of preterm birth were responsible for an estimated 35% of the world's

3 million neonatal deaths in 2010[8], making preterm birth the second most common cause of death in children under-five after pneumonia. Preterm birth also increases the risk of death due to other causes, especially neonatal infections. Hypothermia and malnutrition secondary to poor feeding further increase vulnerability[9,10]

23% mortality in preterm neonates is due to hypothermia, hypoglycemia, hypocalcaemia and intra ventricular hemorrhage.[11] Frequency of hypocalcaemia and hypoglycemia, and hyperbilirubinemia is 46%, 32% and 15%.[12] Preterm birth is associated with many specific acute complications of immaturity including respiratory distress syndrome, intracranial hemorrhage, necrotising enterocolitis, and retinopathy of prematurity (ROP). In almost all high- and middle-income countries, preterm birth is the leading cause of child deaths.

OBJECTIVE
The objective of my study was to determine the frequency of hyper-bilirubinemia and metabolic abnormalities in very preterm babies.

OPERATIONAL DEFINITIONS

Very Pretem Babies
A neonate was considered as very preterm neonate if delivered between 28–32 weeks gestation, assessed from maternal last menstrual period (LMP).

Hyperbilirubinemia
It was defined as serum indirect bilirubin level ≥10 mg/dl.

Metabolic Abnormalities
Metabolic abnormalities include hypoglycemia and hypocalcaemia.
Hypocalcaemia: total serum calcium level <7 mg/dl
Hypoglycemia: random blood glucose level <45 mg/dl

MATERIALS AND METHODS
Study Design
A prospective cross sectional study.

Settings
Neonatology Department, Allied Hospital, Faisalabad.

Duration of Study
14[th]Jan 2017 to 13[th]July 2017.

Sample Size
With confidence level of 95%, absolute precision 8% and p = 17%[5], sample size calculated using WHO sample size calculation formula came to be 120.

Sampling Technique
Non-probability consecutive sampling.

SAMPLE SELECTION

Inclusion Criteria
Very preterm singleton babies born between 28–32 weeks gestation, without lethal congenital anomalies and birth weight > 500 gram presenting in neonatal emergency within first 24 hours of birth were included in the study.

Exclusion Criteria
1. Neonates born to mothers with diabetes mellitus, addiction, renal failure, and hemoglubinopathies.
2. Neonate with congenital toxemia, congenital pneumonia, congenital malformation, or any genetic syndrome.
3. Neonate born to a mother with Rh negative blood group.

DATA COLLECTION PROCEDURE
After the approval to carry out this study from the Ethical Review Committee, subjects meeting the operational definitions and the inclusion criteria were enrolled in the study after informed consent from the parents. Relevant data from the mother's file and other relevant data according to questionnaire were collected after complete examination of the child. Gestational age (calculated using the last day of menstrual period), weight and gender were noted. Serum 3 ml sample was taken through vein puncture at the time of admission and sent to the same lab to check indirect bilirubin level, serum calcium and

random blood glucose level. Results of all the investigations verified by pathologist were noted on the performa.

Data Analysis

The data was analyzed using SPSS version 17.1. Frequency was calculated along with percentage for qualitative variables including gender and presence of hyperbilirubinemia, hypo-glycaemia and hypocalcaemia. For quantitative variables like gestational age, weight, temperature and respiratory rate, mean ±SD was calculated. Effect modifiers like gestation age, weight and gender of the patient were stratified to find out the effect of these on the outcome, through chi square ($p < 0.05$ will, be considered significant).

RESULTS

120 premature born through 28 to 34 weeks of gestation were included in this study with birth weight more than 500 grams. Mean gestational age out these 120 babies was 31 ± 1.4 weeks. Range of weight recorded from minimum 0.91 to maximum 2.3 kg. 95F° body temperature was recorded as minimum and 100F° as maximum with 97.8 ± 0.85 F° mean. Among these babies 30 breaths per minute minimum respiratory rate was recorded while 70 breath per minute was maximum. Mean Oxygen saturation through pulse oxymeter was 82.45 % with minimum 70 % to 91% There were 62(52%) males and 58(48%) Females.

Out of 120 patients, 55 (46%) patients had gestational age ≤ 30 weeks and 65 (54.1%) had gestational age > 30 weeks.

Mode of delivery was NVD in 52(43.3%) and C-section in remaining 118(98.3%). Birth weight was less than 1kg in 9 (7.5%). Blood group was A positive in 42(35%) B positive in 41(34.2%) AB positive in 10 (8.3%) and O positive in 26(22%)

Out of these 120 babies 32 (27%) were SGA + 88(73.3%) were normal for gestation 98C Mean serum bilirubin was 9.6 mg/dl ± 2.31 with minimum 6mg/dl to maximum 15mg/dl.

Out of these 120, minimum blood sugar was

35mg/dl and maximum random blood sugar was 86mg/dl. There was mean serum calcium ± 1.23 with minimum 6.8mg/dl + maximum 1.8mg/dl 68(57%) babies had hyperbilirubinemia while 52(43.3%) had normal bilirubin. Out of 120 patients, 27(22.5%) had hypoglycemia and 88 (73.3%) had normal sugar level and 5 were normoghycemic. Out of 120 patients, 23 (19.1%) patient had hypocalcaemia and 90 (75%) had normal calcium level. 18(15%) babies were hypocalcaemia and 102 (85%) were normal.

DISCUSSION

According to world wide data from united states and developed countries preterm deliveries are an important cause of death in neonates. Although recent advances improve the outcome in premature infants. National neonatal research foundation indicates improvement in neonatal mortality and morbidity delivered at 28 – 34 week between 2007 – 20014.[13]

Birth weight cutoffs are frequently focused in preterm neonates, changes in birth weight outcomes are due to addition of more mature neonatal having iutra uterine growth restrictions.[14]

High risk factors and poor outcomes are associated with very preterm, extreme prematurity. Infants born at 32 – 37 weeks covering almost 78% of preterm babies having better outcome as compared to preterm (22-30 wks) early and late complications are more in late preterm then term babies.[15,16]

Michael et al conducted study for incidence of hypocalcaemia in preterm following British guideline for hypocalcaemia and hypoglycemia shows 38% preterm infant having hypocalcaemia.

Nilium et al having study on hypocalcaemia and treatment modalities 12.5% dextrose with 10% dextrose – reported[17] that 36% preterm having hypoglycemia. Other study conducted by Zilmaz et al level of vitamin D in newborn and associated hypocalcaemia[18]; 36% preterm's were having hypocalcaemia and low level of Vit D. Van der Schoor L.W et al shows increased free unconjugated levels in preterms(26-31weeks).[19]

Valencil schuor et al[20] conducted a study showing that more than 15% of preterm having hyperlirubinemia 28% preterm born through c-section and 16% born through vaginal delivery having jaundice.

My study showed that hyperbilirubinemia, hypoglycemia and hypocalcaemia was 65, 27 and 23 babies common in small of gestational age preterm.

CONCLUSION
Hyperbilirubinemia and metabolic abnormalities like hypoglycemia and hypocalcemia are common problems in very preterm babies. The results of my study give the local burden of these complications that can be helpful in highlighting the importance of screening of such conditions so that special attention could be given to these babies for reduction of neonatal mortality and morbidity.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Imran Sarwar	Review.	
3	Mahboob Alam	Statistics.	
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5	Sadida Bahawal	Paper writer.	