



HYPOGLYCEMIA; A STUDY IN HOSPITALIZED NEONATES AT BAHAWAL VICTORIA HOSPITAL, BAHAWALPUR-PAKISTAN

Dr. Muhammad Ahsan Bajwa¹, Dr. Fiaz Ahmed Malik²

1. MBBS, FCPS
Senior Registrar,
Department of Pediatrics-I,
Bahawal Victoria Hospital,
Quaid-e-Azam Medical College,
Bahawalpur
2. MBBS, FCPS
Senior Registrar,
Department of Pediatrics-I,
Bahawal Victoria Hospital,
Quaid-e-Azam Medical College,
Bahawalpur

Correspondence Address:
Dr. Muhammad Ahsan Bajwa
36-C, Quaid-e-Azam Medical Colony,
Bahawalpur
dr.ahsanbajwa@gmail.com

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ABSTRACT... Introduction: Hypoglycemia is a common condition found in neonates. Much of morbidity and mortality is related to it, although it can be prevented and managed promptly. It is important to estimate the frequency of hypoglycemia in neonates particularly who are sick and are admitted in hospital. **Objective:** To estimate the frequency of hypoglycemia in hospitalized neonates. **Study Design:** Cross-sectional descriptive study. **Sample technique:** Convenience sampling. **Place & duration of study:** The study was conducted in nursery section of Pediatrics unit I at B.V.Hospital, Bahawalpur. from 01-10-2011 to 31-03-2012. **Subjects & Methods:** 60 neonates were taken who were admitted for various ailments in Nursery Section. They were checked for blood sugar level at the time of admission/presentation by glucometer. If found hypoglycemic, blood sample taken for laboratory conformation. Blood sugar levels were taken and analyzed to compare qualitative variables by chi-square test at 5% level of significance. **Results:** 30% among hospitalized neonates were found hypoglycemic including both symptomatic and asymptomatic. **Conclusions:** Neonatal hypoglycemia is observed commonly in hospitalized neonates so blood sugar level of every neonate brought to hospital should be checked.

Key words: Hypoglycemia, Neonate, Hospitalized

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INTRODUCTION

Hypoglycemia refers to low blood glucose level¹. There are controversies regarding its exact definition and cut off value point in neonates in literature even than it is one of the major metabolic abnormality detected in them. Hypoglycemia in neonates has observed almost in every part of the world and its incidence varies globally from 15% in nursery of Iran to 80% in neonatal intensive care unit of Japan². Hypoglycemia damages the developing brain.

Neonatal life is the most vulnerable period of life and neonate may have Hypoglycemia due to many reasons especially those who are sick and hospitalized, particularly in infants of diabetic mother who have the most important event of hypoglycemia within first 24 hours. The

commonest risk factors for neonatal hypoglycemia are Infant of a Diabetic Mother (IDM) intrauterine growth retardation, large for gestational age, Infant of an obese mother, Prematurity, Erythroblatosisfetalis, Polycythemia, Maternal medications (tocolytics, indomethacin, high glucose infusion during labour), Beckwith Weidman syndrome, sepsis, hypothermia, Inborn errors of metabolism and Growth hormone deficiency. Hypoglycemia may also be seen in association with other diseases such as congenital heart disease and asphyxia neonatorum³. Hypoxia decreases the threshold of hypoglycemia in causing neuronal injury⁴. Much of the morbidity and mortality is directly or indirectly related to hypoglycemia in neonates specially those who are sick and are hospitalized. So it is the time to check whether hypoglycemia has any role

in neonatal morbidity and mortality. Hypoglycemia damages the developing brain and produces symptoms like tremulousness, brisk moro reflex, lethargy, poor feeding, irritability, hypotonia, respiratory distress, apnea, bradycardia, seizure, coma and sudden death.⁵ Hypoglycemia may also have long-term sequelae of cognitive impairment, personality changes, speech disorder, low IQ etc.

Hypoglycemia may be discovered in an asymptomatic neonate on routine blood testing particularly those who are sick and are hospitalized. Being the commonest clinical metabolic problem in neonates and have deleterious effect on immature brain. Although the relationship between asymptomatic neonatal hypoglycemic and long term neurological sequelae is not clear even than it should be treated and prevented in every neonate in nursery ideally. So hypoglycemia in neonates should be considered a neuromedical emergency and treated vigorously. Anticipation and prevention of hypoglycemia in infant at high risk of hypoglycemia is very important step in management.

Keeping in view the common condition of Hypoglycemia in neonates and being preventable and treatable condition this study is designed to estimate its frequency and to determine the common risk factors for it in neonates admitted in hospital. It may be useful for acknowledging the iceberg of hypoglycemia in neonatal sickness. The objective of study is to estimate the frequency of hypoglycemia and to determine commonest risk factors for it in hospitalized neonates. Hypoglycemia any value of blood glucose less than 50mg/dl in neonates. Neonate is a baby of age less than or is equal to 28 days.

MATERIAL AND METHODS

This study was conducted at Nursery Section of Pediatrics Unit-I Bahawal Victoria Hospital affiliated with Quaid-e-Azam Medical College Bahawalpur from October 2011 to March 2012. Total 60 Neonates who admitted in nursery section of Pediatric Unit-I either through Outpatient

Department or through Emergency were included in this study after taking informed consent from parents/attendants. Neonates who had intravenous therapy before admission were excluded. Blood sugar was assessed by glucose strip on Glucometer at the time of presentation and confirmed by laboratory. All readings were noted along with name, indoor registration number, age, sex, provisional diagnosis, confirmed diagnosis, symptoms suggestive of hypoglycemia or not, any congenital malformation if present in neonate, any risk factor for hypoglycemia and fate/outcome of the neonate on the especially designed Performa.

Data was analyzed using computer software SPSS version 10.0. Descriptive statistics of frequency and proportional percentages for blood glucose level was computed for gender (sex), age, gestational age (maturity) and symptomatology i.e. symptomatic or asymptomatic for hypoglycemia. Chi-square/Fisher's exact test which ever one was applied to compare the variables gender (sex), age, gestational age (maturity) and symptomatology at 5% level of significance i.e. $\alpha=0.05$.

RESULTS

In 60 neonates, out of which 34 were males and 26 were females. Male to female ratio was 1.3:1. Thirty-four (56.66%) of them were less than one day age, Twenty Four (40%) were between 1-7 days and only two were greater than 7 days of age. Fifty two (86.66%) neonates were full term, seven (11.66%) were preterm and only one (1.66%) was postterm. Weight wise 42 (70%) neonates were greater than 2.5 kg and 18 (30%) were of less than 2.5 kg.

Hypoglycemia was found in 18 (30%). In eighteen hypoglycemic neonates thirteen were full term and five were preterm. Weight wise in eighteen hypoglycemic neonates nine (50%) were low birth weight babies (< 2.5 kg) and nine (50%) were normal birth weight (>2.5 kg). Hypoglycemia in neonates according to age and symptomatology well showed in table I and II.

Age	Hypoglycemia		P value (Chi square)
	Yes	No	
< 1 day (<24 hours)	08	26	0.226
1-7 days	10	14	
> 7 days	-	2	

Table-I. Frequency of neonatal hypoglycemia according to age (n=60)

Symptomatology	Hypoglycemia		P value (Chi square)
	Yes	No	
Asymptomatic	06	22	0.175
Symptomatic	12	20	

Table-II. Frequency of neonatal hypoglycemia according to symptomatology (n=60)

DISCUSSION

Eighteen neonates were found hypoglycemic in which nine were male and nine were females. Eight hypoglycemic neonates are of age less than 1 day (< 24 hours) 10 hypoglycemic were of age greater than 1 day (> 24 hours). This is important from screening point of view where especial emphasis should be made upon the risk of hypoglycemia occurrence throughout the neonatal life because neonatal life is actually a transitional phase from an absolute dependence on placental nutrition to metabolic and nutritional independence via feeding.

The incidence reported for neonatal hypoglycemia globally has varied greatly 15.5% in Iran to 80% in Japan in neonatal ICU due to different definitions and criterias for the diagnosis of neonatal hypoglycemia in different situations⁶. It is equally important that while employing an accurate diagnostic method, close and careful observation of the infant is ensured for evidence of clinical manifestation of hypoglycemia. The frequency of hypoglycemia was found 30% is slightly higher frequency of neonatal hypoglycemia in this study as compared to literature⁷. (15-25%) can be attributed to the

selection of study population, which includes obviously sick babies having one or more risk factors of hypoglycemia referred for intensive care. Secondly they are checked at different ages throughout the neonatal period (first 28 days of life) irrespective of their feeding status and gestational age. Thirdly study consists of only 60 neonates which definitely has its own limitation to cover the vast subject of hypoglycemia in all the neonates.

In present study hypoglycemia was found more in low birth weight (< 2.5 kg) neonates (50%) as compared to normal birth weight (> 2.5 kg) neonates (21.7%). This phenomena is already well documented in the literature due to their less energy stores. Moreover, majority of neonates found hypoglycemic were preterm (71%) as compared to full term (33%). This is important as prematurity is considered as special risk for hypoglycemia due to so many reasons⁸⁻⁹.

The literature refers to numerous clinical features with low plasma glucose concentrations. They include pallor, sweating, apnea, cyanosis, seizures, hyporeflexia and refusal of feeding. Almost 66.6 % of the hypoglycemic neonates showed significant clinical features of hypoglycemia. The significance of this symptomatic hypoglycemia is if allowed to go untreated the infant may die or subsequently develop serious neurological handicaps¹⁰⁻¹⁸. However a proportion of hypoglycemic neonates (33.4%) were asymptomatic due to an increased utilization of alternative substrates, such as lactate, in combination with intracerebral storage of glycogen. This may be a situation for some children of diabetic mothers with transient hyperinsulinemia secondary to maternal hyperglycemia. Lactate is produced in the adipose tissue in the presence of insulin. Lactate is high in subcutaneous adipose tissue in neonates and may be a source of circulating lactate, which in turn can serve as an alternative fuel for the brain during hypoglycemia. Furthermore, astrocytes can store glycogen and directly supply the neurons with glucose. The immediate priority in medical treatment is to provide an adequate

amount of carbohydrate to ensure that blood glucose is maintained in normal range. All hypoglycemic neonates should undergo careful surveillance including careful monitoring and therapy of serum glucose¹⁹.

Although the relationship of asymptomatic hypoglycemia in neonates and long term neurological sequelae is still not clear further studies should be needed in this aspect. One important observation is that 52.38% of normoglycemic neonates were having symptoms suggestive of hypoglycemia, this means findings of hypoglycemia are nonspecific in neonates.

CONCLUSIONS

Hypoglycemia is a common condition found in sick neonates admitted in hospital for various ailments. Therefore, the blood sugar level of every neonate brought to hospital should be checked. If hypoglycemia found, it should be treated and prevented promptly.

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