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To Study the Risk Factors and Clinical Profile of Neonatal Hypoglycemia In Babies Admitted In The Neonatal Unit In Tertiary Care Hospital.

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Abstract

Hypoglycemia is known to be associated with brain dysfunction and neuromotor developmental retardation in both symptomatic and asymptomatic cases. The study has been done to evaluate clinical profile and risk factors (maternal and neonatal) of neonatal hypoglycemia.

Low blood glucose values are common in healthy neonate immediately after birth as compared to older infants, children, and adults. These transiently low blood glucose values improve normal ranges within hours after birth called TNH (transient neonatal hypoglycemia).

The blood glucose concentrations of 114 neonates were screened at 0hr, 3hr, 6hr, 12hr, 24hr, 48hr, and 72hr of life. Neonates with hypoglycemia (BGL <40mg/dl) during routine screening were recruited for the study.

In present study out of 114 neonates with hypoglycemia, 37.71% were symptomatic and 62.29% neonates were asymptomatic.

The most common neonatal risk factor associated with hypoglycemia was birth asphyxia. The most common antenatal risk factor associated with neonatal hypoglycemia was diabetes in mothers.

Our study showed that low birth weight, preterm, post term, small for gestational age, large for gestational age neonates are at increased risk of developing hypoglycemia.

Hence, irrespective of clinical presentation, at risk neonate has to be screened for blood glucose level within 72 hours which can prevent hypoglycemia.

Keywords: neonates, hypoglycemia, blood glucose, risk factors

Introduction

Hypoglycemia is one of the common metabolic problems in newborns; the assessment of blood glucose has consequently become a significant part of basic neonatal care in many hospitals. Various factors affect neonatal hypoglycemia even in healthy term neonates like birth weight, gestational age, perinatal complications, mode of delivery, and feeding behaviour. The overall incidence has been estimated at 1 to 5 per 1,000 live births, but it is higher in at-risk populations. For example, 8% of large-for gestational-age infants (primarily infants of diabetic mothers [IDMs]) and 15% of preterm infants and infants who have intrauterine growth retardation (IUGR) have been reported as having hypoglycemia; the incidence in the entire population of "high-risk" infants may be as high as 30% .

Hence this study has been done to evaluate clinical profile and risk factors (maternal and neonatal) of neonatal hypoglycemia.

Aims:

We aim to assess the maternal and neonatal risk factors of neonatal hypoglycemia in a tertiary care hospital.

Objective :

1. To know clinical profile of patient of neonatal hypoglycemia.
2. To know outcome of hypoglycemia (discharge /death).

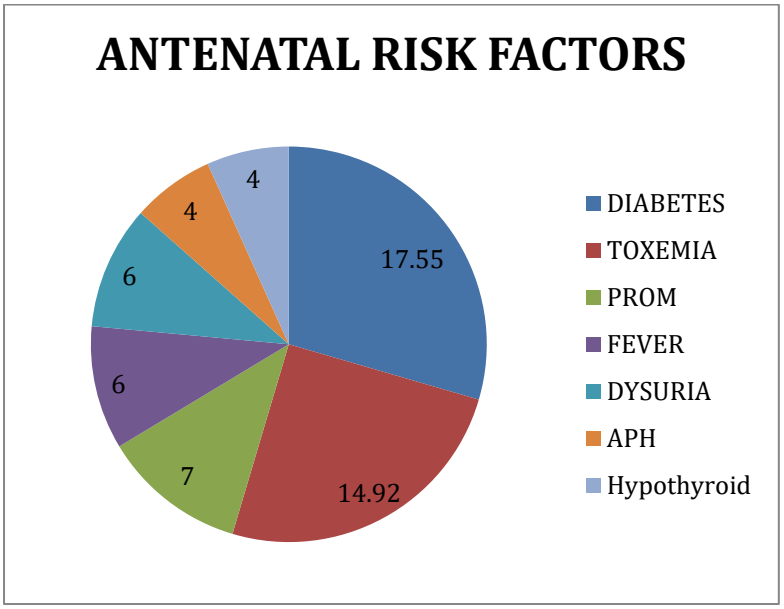
Methods and Materials:

It was hospital based study conducted over a period of 15 months from July 2019 to September 2020 and data analysis was conducted over a period of 15 months at NICU. The calculated sample size was 114 with level of significance set at 95%. All babies having plasma glucose level <45 mg/dl by strip on glucometer or serum blood glucose <40 mg/dl on admission and during hospital stay were included. Neonates with congenital anomalies, chromosomal anomalies and inborn errors of metabolism were excluded from study. Outcome was measured as discharged from hospital or expired during hospital stay.

Results:

The overall incidence of neonatal hypoglycemia in present study was found to be 13.68/1000 live births. Out of 114 neonates, 74 (64.91%) were preterm, 26 (22.8%) were term and 14(12.29%) were post term while 53 (46.50%) were SGA, 40 (35.09%) were AGA, and 21 (18.41%) were LGA.

In present study the most common antenatal risk factor associated with neonatal hypoglycemia was diabetes in 20 (17.55%) mothers. The other common antenatal risk factors were toxemia of pregnancy, PROM, fever, dysuria, APH and hypothyroidism. No risk factor identified in 53 neonates , >1 risk factor identified in 3 newborns.



In present study the most common neonatal risk factor associated with hypoglycemia was birth asphyxia followed by RDS, septicemia and meningitis.

In present study out of 114 neonates, 43 (37.71%) were symptomatic and 71 (62.29%) neonates were asymptomatic.

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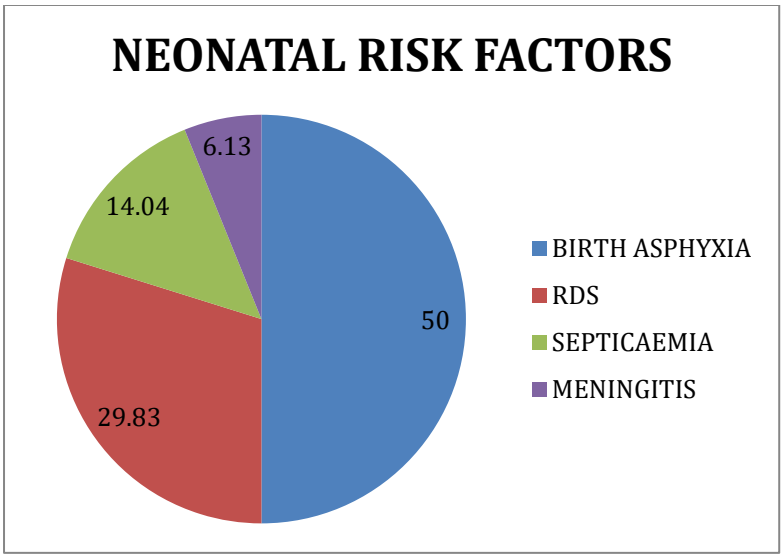

Table 1: Comparison of mean blood sugar level between symptomatic and asymptomatic hypoglycemic neonates.

	cases (n=114)	Mean ± SD (mg/dl)	P value
Symptomatic	43	27.8200 ± 2.1911	P<0.001
Asymptomatic	71	37.9535 ± 3.2595	

After applying t-test, significantly low mean blood sugar levels were noticed in symptomatic hypoglycemia babies when compared to asymptomatic hypoglycemic babies.

In present study the most common symptom associated with neonatal hypoglycemia was lethargy, followed by seizures, jitteriness and hypotonia. In present study out of 114 neonates 80 (70.18%) were discharged and 34 (29.82%) were expired. In present study the most common cause of neonatal death in hypoglycemic neonates was birth asphyxia in 19 (55.89%) followed by RDS in 8(23.53%), septicemia in 4(11.77%) and meningitis in 3(8.81%).

Out of 114 neonates, 74(64.92%) neonates treated with IV glucose bolus only, 39(34.22%) neonates treated with IV glucose bolus & glucose infusion according to GDR, and only 1(0.86%) neonate required IV glucose bolus, glucose infusion according to GDR & steroid.

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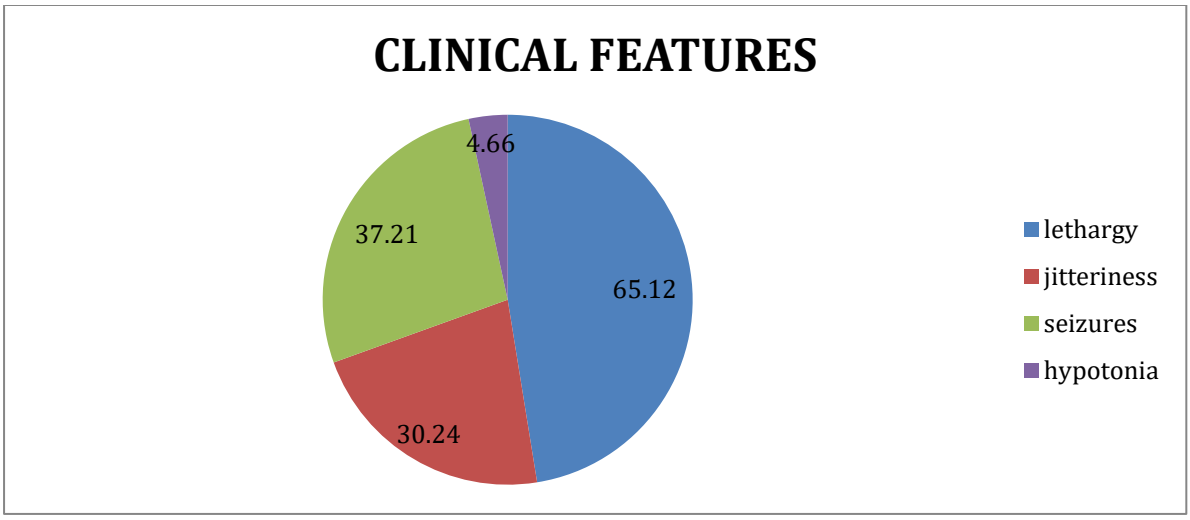
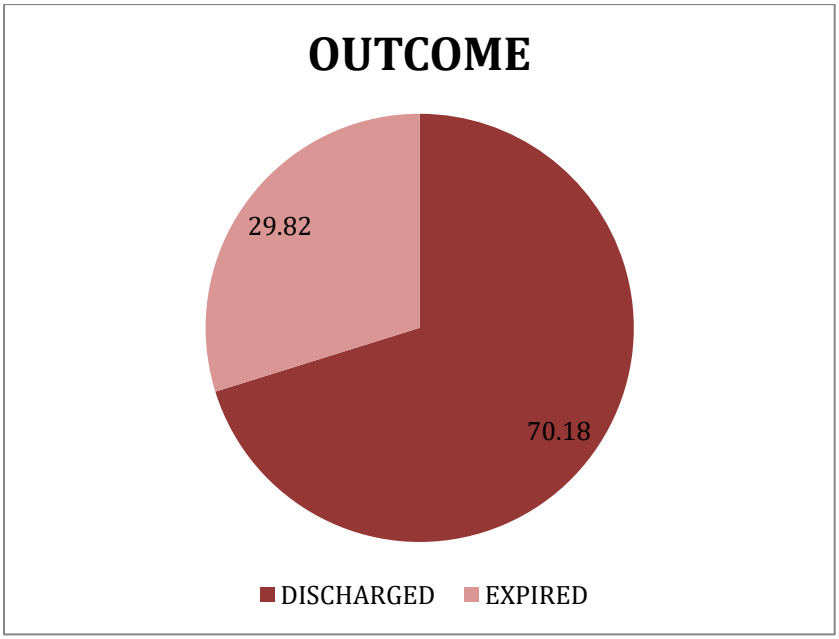


In present study the most common cause of neonatal deaths was birth asphyxia in 19 (55.89%) neonates followed by RDS in 8(23.53%) neonates, septicemia in 4(11.77%) neonates and meningitis in 3(8.81%) neonates.



Discussion:

Hypoglycemia is one of the most common metabolic problems encountered in the newborn. The overall incidence of hypoglycemia in neonates varies from 2 to 11.4%. However, in the presence of certain high risk factors i.e. small for gestational age, large for gestational age, infants born to gestational or insulin dependent diabetic mother (IGDM, IDMs), prematurity etc., the probability of hypoglycemia increase many folds3,8,9,10.

In our study, incidence of neonatal hypoglycemia was 13.68% while in Cloharty et al13 it was 16% in LGA and 15% in SGA neonates, in Dhananjaya et al11 incidence was 4.2%, Wei Zhou et al14 reported 16.9%, which was comparable to our study and K. Singh, A Kher et al15 reported Incidence of 22.49%.

In our study, 76 (66.7%) were male and 38(33.3%) were female neonates. The male to female ratio was 2, suggesting that the incidence of neonatal hypoglycemia was higher in male neonates than female neonates.

Similarly, in Najati et al (2010)12 hypoglycemia was common in male neonates (53.8%) compared to female neonates (46.2%) with male to female ratio of

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1.2:1 while in Dhananjaya et al (2011)11 hypoglycemia was present in 57.89% of male neonates and 42.1% of female neonates which correlate with our study.

In present study, 47 (41.23%) were delivered vaginally and 67 (58.77%) neonates were born by LSCS delivery. Thus incidence of neonatal hypoglycemia was higher in LSCS delivered neonates compared to vaginal delivered neonates. Similarly in Cole et al (1994)5 the incidence of hypoglycemia was 43% in neonates delivered by caesarean section and 37% in neonates delivered by vaginal route which correlates with our study.

In our study, 82 (71.85%) low birth weight (<2.5kg) neonates had hypoglycemia and 32 (28.15%) neonates with hypoglycemia were weighing >2.5kg. Thus hypoglycemia was common in LBW neonates (<2.5kg) compared to neonates weighing >2.5kg which correlate with study done by Dhananjaya et al (2011)11 which state that prematurity and low birth weight increase risk of hypoglycemia in neonates.

In our study, 74 (64.91%) neonates were preterm (<37 weeks), 26 (22.8%) neonates were term (37-42 weeks) and 14(12.29%) neonates were post term (>42 weeks). Thus hypoglycemia was more common in preterm neonates similar result were found in Manjunatha babu et al16 reported that majority (57.5%) of hypoglycemic babies were preterm babies and 42.5% were term babies.

In present study the most common antenatal risk factor associated with neonatal hypoglycemia was diabetes in 20 (17.55%) mothers. The other common antenatal risk factors were toxemia of pregnancy, PROM, fever, dysuria, APH and hypothyroidism which was similar to Dhananjaya et al11 (2011) study.

In present study the most common neonatal risk factor associated with hypoglycemia was birth asphyxia in 57 (50%) neonates followed by RDS in 34 (29.83%) neonates, septicemia in 16 (14.04%) neonates and meningitis in 7 (6.13%) neonates while in Dhananjaya et al (2011)11 26.86% neonates with birth asphyxia, 15.2% neonates with septicemia, and 15.38% neonates with RDS had hypoglycemia which correlates with our study.

In present study out of 114 neonates with hypoglycemia, 43 (37.71%) were symptomatic and 71 (62.29%) neonates were asymptomatic. In present study the most common symptom associated with neonatal hypoglycemia was lethargy followed by seizures, jitteriness and hypotonia which is similar to Dhananjaya et al11 (2011) study. In present study out of 114 neonates, 80(70.18%) neonates were discharged and 34(29.82%) neonates were expired. The most common cause of neonatal deaths was birth asphyxia in 19 (55.89%) neonates followed by RDS in 8(23.53%) neonates, septicemia in 4(11.77%) neonates and meningitis in 3(8.81%) neonates. which is similar to Najati et al (2010)12 reported 53.8% mortality in neonates with hypoglycemia and most common cause of death was prematurity in 78.6%, RDS in 10.7%, septicemia in 2% and birth asphyxia in 3.6%.

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