Original Article

Evaluation of Hypoglycemia in Low Birth Weight Babies

Hypoglycemia in Low Birth Weight Babies

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ABSTRACT

Objective: To determine the prevalence of hypoglycemia in low birth weight babies and to detect onset of hypoglycemia in first 24 hours.

Study Design: Observational study

Place and Duration of Study: This study was conducted at the Paediatrics Department, Ganga Ram Hospital, Lahore from January 2014 to August 2014.

Materials and Methods: Two hundred low birth weight babies delivered and shifted to neonatal nursery for observation and screening are included in the study. Screening was done 1 hourly for 4 hours and 4 hourly for next 20 hours by Gluco sticks and sample was taken from heel prick. Blood glucose levels are monitored for first 24 hours of life.

Results: Total 200 babies, were included in this study out of which 15 babies developed hypoglycemia so 5% prevalence of hypoglycemia was found of the babies developed asymptomatic hypoglycemia and 20% developed Symptomatic. Commonest symptoms for hypoglycemia are reluctance to feed. Eighty present of the babies developed hypoglycemia within first 4 hours of life however 20% babies develop hypoglycemia up to 16 hours of life.

Conclusion: Five percent of babies developed hypoglycemia and onset of hypoglycemia occurs mainly in first 4 hours of life. Majority of the babies developed asymptomatic hypoglycemia however 20% babies develop symptomatic hypoglycemia. Suggestion all the low birth weight babies must be screened for hypoglycemia in first 4 hours in order to prevent complications and poor outcome due to hypoglycemia.

Key Words: Hypoglycemia, Low birth weight, Prevalence.

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INTRODUCTION

Clinically significant neonatal hypoglycemia is defined as plasma glucose levels of <40 mg/dL.[1] Transitional hypoglycemia is common in healthy newborns immediately after birth. These levels improve and reach to normal in the first few hours after birth.[2] No studies have demonstrated harm from these few hours of asymptomatic hypoglycemia during this period of physiologic adaptation.[3] Babies less than 2500gm are low birth weight baby. Low birth weight babies have increased risk of developing hypoglycemia.[4-8] The incidence of symptomatic hypoglycemia in neonates was found to be 3.4% in a study conducted in Israel in 2014.[1] Whereas in a prospective study conducted in Iran during January 2009-2010, the prevalence of hypoglycemia was found to be 0.4%.[9]

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No reliable data is available from local studies. The objective of this study was to determine the prevalence of neonatal hypoglycemia during the first 24 hours and to detect the time of onset of hypoglycemia in low birth weight babies.

MATERIALS AND METHODS

This was an observational study conducted in the nursery of Ganga Ram Hospital, Lahore from January 2014 to August 2014. All low birth weight babies (< 2,500gm) babies born in the hospital during this time were included in the study. Blood glucose levels were monitored 1 hourly for first 4 hours and then 4 hourly next 20 hours by Gluco sticks and sample was taken from heel prick. All the data were recorded and the prevalence of asymptomatic and symptomatic hypoglycemia was calculated.

RESULTS

A total of 300 patients were included in this study of these, 105 (52.2%) were males and 95 (47.8%) were females. Hypoglycemia was recorded in a total of 10 patients out of 200 (5%). 39 of them (18.50%) were LBW (low birth weight) and 161 (80.20%) were VLBW (very low birth weight) (Table 1). Of the 10 babies with hypoglycemia, 7 were males (70%) and 3 were females (30%) (Table 2)

80% of the babies developed asymptomatic hypoglycemia (having no clinical significance) and 20% developed symptomatic hypoglycemia as observed in 3 (Table 3). The highest prevalence was found in babies belonging to gestational age of 28-31 weeks (100%) (Table 4).

Table No.1: Distribution of Babies by birth weight

Weight	No of babies	percentage
1001-1500gm	161	80.20%
1501 – 2500gm	39	19.30%

Table No.2: Hypoglycemia According to Sex

Sex of babies		No of babies with hypoglycemia	Percentage
Male	115	7	70%
Female	85	3	30%

Table No.3: Babies with Symptomatic and Asymptomatic Hypoglycemia

Hypoglycemia	No of babies	Percentage
Asymptomatic	8	80%
Symptomatic	2	20%

Table No.4: Babies According to Gestational Age

Gestational Age	No of babies	Babies with hypoglycemia	%age
28 - 31 weeks	3	3	100
32 – 36 weeks	98	6	6.5
>36 weeks	99	1	1

DISCUSSION

Low birth weight babies are prone to developed hypoglycemia.[10-11] Low birth weight babies may include prematures, intra uterine growth retardation.[13-15] These are the risk factors to develop hypoglycemia.[16-17] Hypoglycemia in low birth weight may cause severe morbidity if not detected and treated early.[18-19] In the study prevalence of hypoglycemia was found 5%. International studies conducted on neonatal hypoglycemia report an incidence of 14.7% in the United States, with the mean age of occurrence at 6.1 hours of life,[20] and 16.9% in China, occurring mainly in the first 3 days of life.[21] In our study, onset of hypoglycemia was mainly in first four hours after delivery however 20% of the babies developed hypoglycemia up to 16 hours of age. Reluctance of feeding was the only symptom noticed in our study screening method and that reported.[22] We used is comprehensive and picked all cases of hypoglycemia however in the resource constraint area we can monitor at least for first four hours of life for hypoglycemia. In this way we can reduce hospitalization, parental anxiety, separation of mother and baby and economic burden on family.

The newborns at risk are preterm, LGA, SGA, and/or intrauterine growth retarded (IUGR) infants.[23]The early milk feedings with glucose administration is the usual treatment for asymptomatic hypoglycemia in these patients.[24] This method makes mothers and babies together, and supply glucose. If hypoglycemia remains after frequent milk feedings, a continuous intravenous dextrose infusion may be indicated. A dextrose infusion rate of 3–5 mg/kg/ min can be used. A dextrose infusion rate of 6–8 mg/kg/min often is necessary in IUGR infants. Glucose concentrations must be monitored. In fact, partial or complete resolution of the symptoms with correction of glucose concentrations.[25]

CONCLUSION

Five percent of babies developed hypoglycemia and onset of hypoglycemia occurs mainly in first 4 hours of life. Majority of the babies developed asymptomatic hypoglycemia however 20% babies develop symptomatic hypoglycemia. Suggestion all the low birth weight babies must be screened for hypoglycemia in first 4 hours in order to prevent complications and poor outcome due to hypoglycemia.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. David HA. Postnatal glucose homeostasis in late-preterm and term infants. AAP News J 2011;127.
2. Alecia TB, Thomas H.Neonatal hypoglycemia. AAP News J 2017 38.
3. Rozance PJ, Hay W.Hypoglycemia in newborn infants: features associated with adverse outcomes. Biol Neonate 2016; 90: 74-86.
4. Das AC, Azad T, Nazme NI, Chowdhury JF, Rahaman Z, Rahman Z. Incidence and Glycemic Status of Infants of Diabetic Mothers among 189 Hospitalized Low Birth Weight Babies. Delta Med Coll J 2017; 5: 4-8.
5. Arun P, Tushar P. Maternal risk factors and outcome of low birth weight babies admitted to a Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India-A cross-sectional study. Int J Med Oncol Peditar 2017; 3: 54-56.
6. DeBruin CDE, van der Lugt NM, Visser R, Oostdijk W, van Zwet EW, te Pas AB, et al.

Dysglycaemia in small-for-gestational-age neonates: a matched case–control study in monochorionic twins. J Maternal-Fetal Neonat Med 2016; 29: 2114-9.
7. Sharma D, Farahbakhsh N, Shastri S, Sharma P.Intrauterine growth restriction – part 2. J Maternal-Fetal Neonat Med 2016; 29: 4037-48.
8. Rubin B, Assaf P, Yair K, Sharon E, Gil K, Floris LK. Early neonatal hypoglycemia: incidence of and risk factors. A cohort study using universal point of care screening. J Maternal-Fetal Neonat Med 2017; 1-7
9. Najati N, Saboktakin L.Prevalence and underlying etiologies of neonatal hypoglycemia. PJBS 2010; 13: 753-6.
10. Kaur A, Thapar K, Chhabra GS, Jaslean.Morbidity and Mortality of Very Low Birth Weight Babies in a Tertiary Level NICU. J Nepal Pediat Soc 2013; 35:257-63.
11. Shaikh F, Laghari GS, Syal AR, Nizammi AH, Akbar M.Complications of low birth weight babies during first 72 hours of life. EBSCO 2016;22: 18-24.
12. Ogunyemi D, Friedman P, Whitten A, Sugiyama N, Qu L, Kohn A. et al.Obstetrical correlates and perinatal consequences of neonatal hypoglycemia in term infants. J Maternal-Fetal Neonat Med 2017; 30: 1372-7.
13. Bromiker R, Perry A, Kasirer Y, Einav S, Klinger G, Khademi FL.Early neonatal hypoglycemia: incidence of and risk factors. A cohort study using universal point of care screening. J Maternal-Fetal Neonat Med 2017.
14. Rozance PJ, Hay WW. New approaches to management of neonatal hypoglycemia. BMC 2016.
15. McGuire, SF. Understanding the Implications of Birth Weight.Nursing for Women's Health 2017; 21: 45-49.
16. Saw HP, Yao NW, Chiu CD, Chen JY. The value of real-time continuous glucose monitoring in premature infants of diabetic mothers. PLOS 2017.
17. Rozance PJ, Hay WW. Modern Management of Preterm Infants Prevents Adverse Developmental Outcomes From Hypoglycemia. AAP News J 2016.
18. Tsao MF, Chang HW, Chang CH, Cheng CH, Lin HC. Evaluation of Blood Glucose Monitoring System in Screening for Neonatal Hypoglycemia: Tighter Accuracy Standard.JDST 2017; 11.
19. Christopher JD, McKinlay, Jane MA, Nicola SA, Nataliia, Arijit C, Chase JG, et al Association of Neonatal Glycemia With Neurodevelopmental Outcomes at 4.5 Years. JAMA Pediatr 2017; 10:972-83.
20. Holtrop PC. The frequency of hypoglycemia in full-term large and small for gestational age newborns.Pubmed 1993; 10: 150-4.
21. Wei Z, Jun Y, Yiqi W, Huawei Z.Hypoglycemia incidence and risk factors assessment in hospitalized neonates. J Mat Fetal Neona Med 2015; 28: 422-425.
22. Brown LD, Rozance PJ. A Sweet Addition for the Treatment of Neonatal Hypoglycemia. J Pediatr 2017; 70: 10-12.
23. Adamkin DH. Postnatal glucose homeostasis in late-preterm and term infants. Pediatrics. 2011; 127:575–9.
24. Glucose production in fetal sheep with intrauterine growth restriction is not suppressed by insulin. Diabetes 2013;62:65–73.
25. Harris DL, Weston PJ, Signal M, Chase JG, Harding JE. Dextrose gel for neonatal hypoglycaemia (the Sugar Babies Study): a randomised, double- blind, placebo-controlled trial. Lancet 2013;382:2077–83.