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Research Paper

Hypoglycaemia of the newborn in the maternity case of the General Reference Hospital/Panzi

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ABSTRACT: *Neonatal hypoglycaemia continues to be one of the most important health problems worldwide. Creating awareness among the community still plays a vital role in preventing and controlling the spread of Neonatal hypoglycaemia. The objective of this study was to improve the level of newborn health while diagnosing and recognizing newborns at risk and symptoms of hypoglycemia. This cross-sectional survey of babies of the South Kivu province at the DRC was carried out between January 2021 and August 2021 were monitored at HGR/PANZI and using questionnaire. Microsoft excel software was used to evaluate the data using the necessary statistical tests. Results: In this study 58.6% babies were males and 41.4% were females. The great multiparous is the most important cause of cases of hypoglycemia with a rate of 55%. The high frequency of hypoglycemia is explained by the fact that, being an under-equipped country, the country suffers from a lack of equipment and infrastructure and poor monitoring of pregnancy during the 3rd trimester. The transitional type dominates that the persistent type in the newborn in the study environment. 27% of newborns presented persistent hypoglycaemia for several hours. 77% of newborns presented symptoms of hypotrophy, drowsiness, severe malaise and coma. More than half of newborns have hypoglycemia on the first day of their life, a rate of 52.5%. The rate is the same for the hospital stay. A death rate of 14.8% was recorded and this is deplorable. Neonatal hypoglycemia is a common complication among preterm infants, small-for-gestational-age infants, and infants of diabetic mothers. Newborn hypoglycemia is an extreme emergency. Prevention and correction must be rapid, effective, and controlled because they risk worsening and causing neonatal death or even irreversible brain damage..*

KEYWORDS: *Neonatal, hypoglycaemia, newborn, multiparous, diabetic*

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I. INTRODUCTION

Glucose provides metabolic fuel for the developing fetus. While in utero, the fetus receives a steady supply of glucose from its mother via facilitated diffusion across the placenta and produces its own insulin to permit euglycemia. Post-natally, the constant supply of glucose ceases and neonatal concentrations of insulin must be regulated. Lower blood glucose values are commonly seen in the healthy neonatal population in the first 24 to 48 postnatal hours as compared to values in the older child and adult populations. These lower blood glucose values early after birth are observed in all mammals, leading to the conclusion that they may represent an evolutionary adaptation to early life outside the womb. The lower values may be transitional and non-pathologic, occurring as the fetus acclimates to postnatal life while establishing a source of metabolic fuel. The brain primarily uses glucose to meet its metabolic demands. The healthy newborn requires a higher glucose infusion rate (the rate at which glucose is made available to the body) that is up to 2 to 3 times more per kilogram of weight than that seen in adults because of the proportionally larger brain-to–body mass ratio of infants. Accordingly, newborns need to maintain regular and more frequent feedings by the first few days after birth. Any inability to procure, take in, and metabolize feedings at a rate that supports the production and maintenance of standard blood glucose concentrations may lead to hypoglycemia that is severe and persistent in the newborn. Severe and prolonged hypoglycemia in the neonatal population may be associated with seizure

activity and abnormal neurologic outcomes, although it is unclear at what specific values of blood glucose these metabolic aberrations occur and after how long a duration of hypoglycemia [1].

Although hypoglycemia represents a low level of blood glucose that can negatively affect neurological and developmental prognosis, its numerical definition is a rather complicated and controversial issue. Hypoglycemia often does not produce clinical signs because the newborn brain does not have enough maturity[2]. Thus, newborns at risk are newborns of diabetic mothers, hypotrophic newborns, macrosomic newborns, premature newborns, twin newborns and newborns who have suffered from hypothermia. Newborns who have suffered from perinatal stress are those with early or late neonatal infection. Though it is not possible to give exact glucose values that define hypoglycemia, the American Academy of Pediatrics (AAP), Committee on Fetus and Newborn defined safe glucose concentrations in the 2011 guidelines for newborns at risk of hypoglycemia[3]. In the guide, the glucose levels which required intervention to prevent brain damage in newborns were determined based on Cornblath and Ichord4 guideline in 2000.

Hyperglycaemia and hypoglycaemia remain difficult to define, as the clinical significance will critically be dependent on the context and length of exposure [4]. Both hyperglycaemia and hypoglycaemia are associated with increased mortality and morbidity in preterm infants [5] [6] [7] [8] [9] [10] and [11] but causality is not clear and optimal treatment strategies have yet to be determined. The methods used for glucose measurement vary widely across clinical services, which try to balance a desire for limited blood sampling and an 'immediate' result with the need for clinically acceptable accuracy [12].

A small or life-threatening newborn is an emergency situation that requires immediate diagnosis and management. Any delay in identifying the problem or in taking care of it can be fatal. So, what is the epidemiology of hypoglycemia in newborns at the General Referral Hospital (HGR)/Panzi, Bukuvu, South Kivu province, DRC.

The objective of the study is to improve the level of newborn health while diagnosing and recognizing newborns at risk and symptoms of hypoglycemia.

II. MATERIAL AND METHOD

2.1 STUDY MATERIAL

The research approach was a descriptive and the research design was a cross-sectional survey design. 61 cases of hypoglycemia were monitored in the Neonatology Department at HGR/Panzi (2° 32′ 36″ South, 28° 52′ 04″ East) during the period between January 2021 to August 2021, including 26 girls and 35 boys. According data collection, data was collected under the guidance of supervisors by using questionnaire which contained the determination of blood glucose, the meter, the strips, and the shoelaces. Responses were then recorded in Excel spreadsheet and for ethical considerations, participants' confidentiality and anonymity was maintained. For data analysis, data was collected and entered in Microsoft excel spread sheet, cleaned for errors and analyzed with Microsoft excel with appropriate statistical test in terms of frequencies and percentage.

III. RESULTS

The distribution of cases of children in hypoglycemia depending on the month and is presented in Figure 1, below. The number of high cases was in March followed in January then, respectively in February and August.

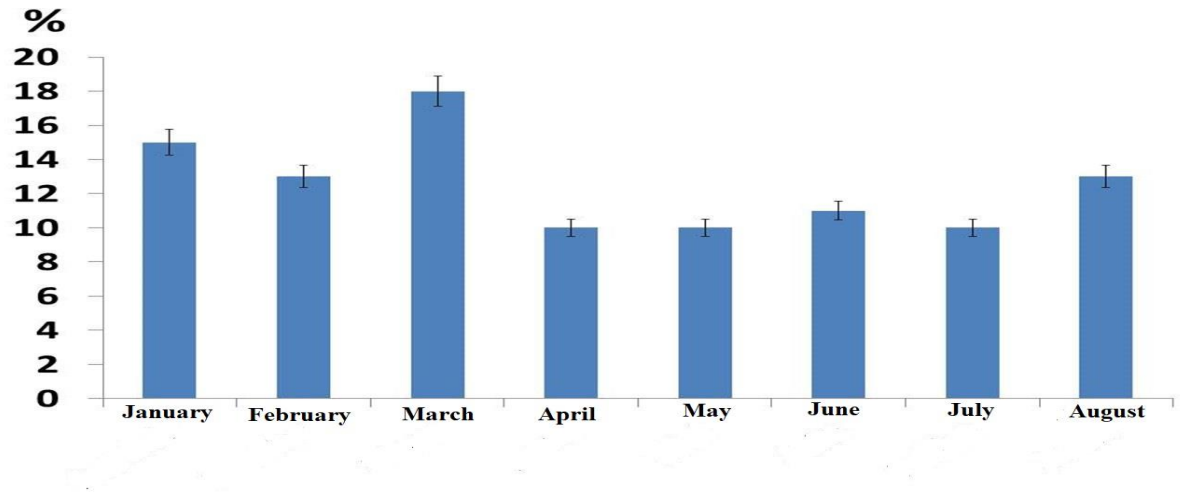

Figure 1: Number of cases of children in hypoglycemia depending on the month

Regarding the distribution of cases depending on the delivery, Figure 2 shows that the greatest number of cases during childbirth was in April, followed by June, then in July and then still in February.

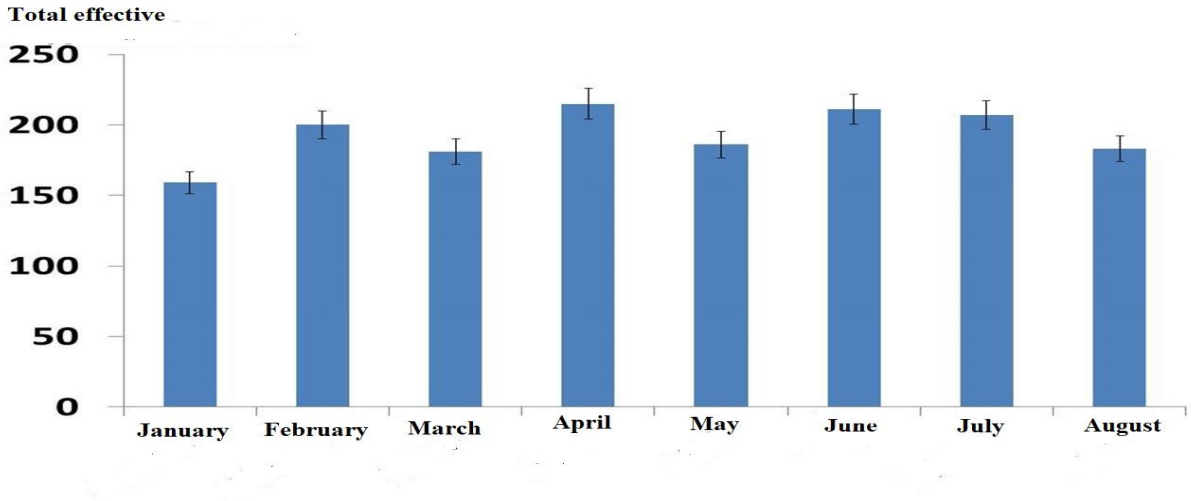

Figure 2:Number of cases during deliveries

The figure below on the distribution of cases according to the sexes shows that the males are more affected than females.

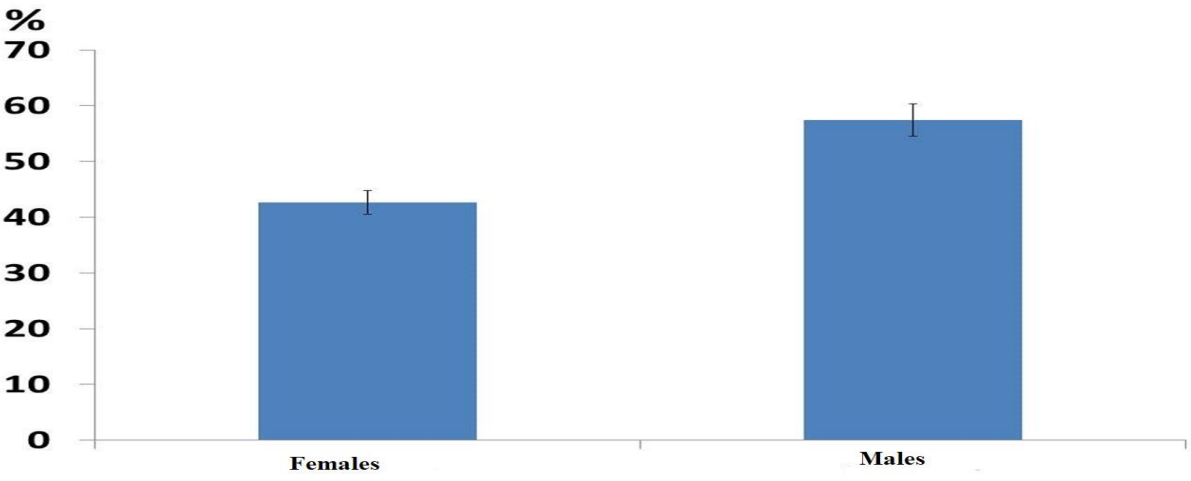

Figure 3. Case according to the sexes

However, the distribution according to parity is presented in Figure 4, Great Multiparous was numerous then the Multiparous and finally the Primipara.

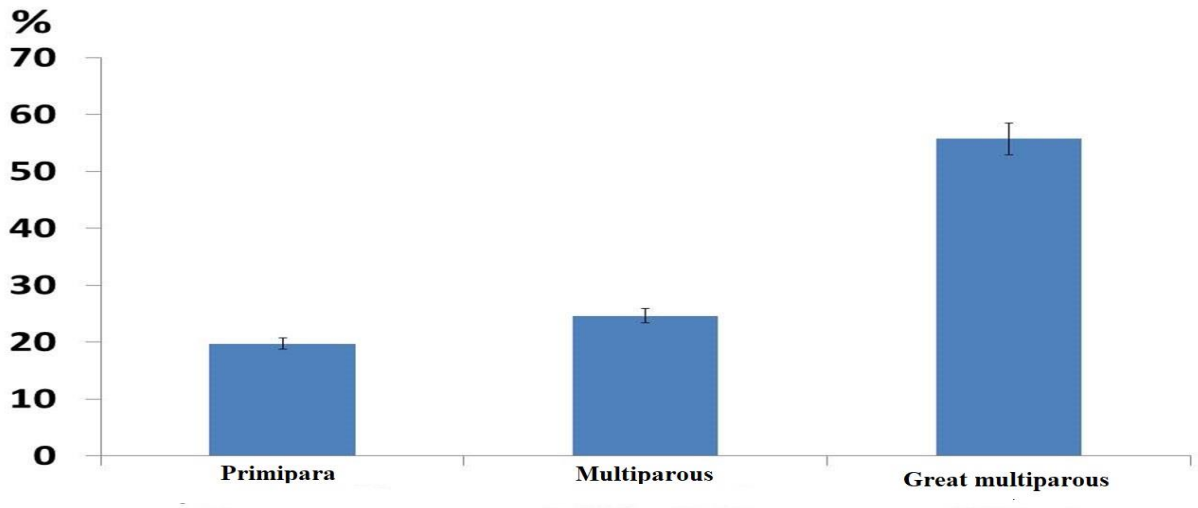

Figure 4: Breakdown by parity

Thus figure 5 presents the distribution according to the presumed causes: Hypotrophy comes first followed by prematureness, then respectively by twin pregnancy and fetal pain, then again by hypertrophy and finally by neonatal infection

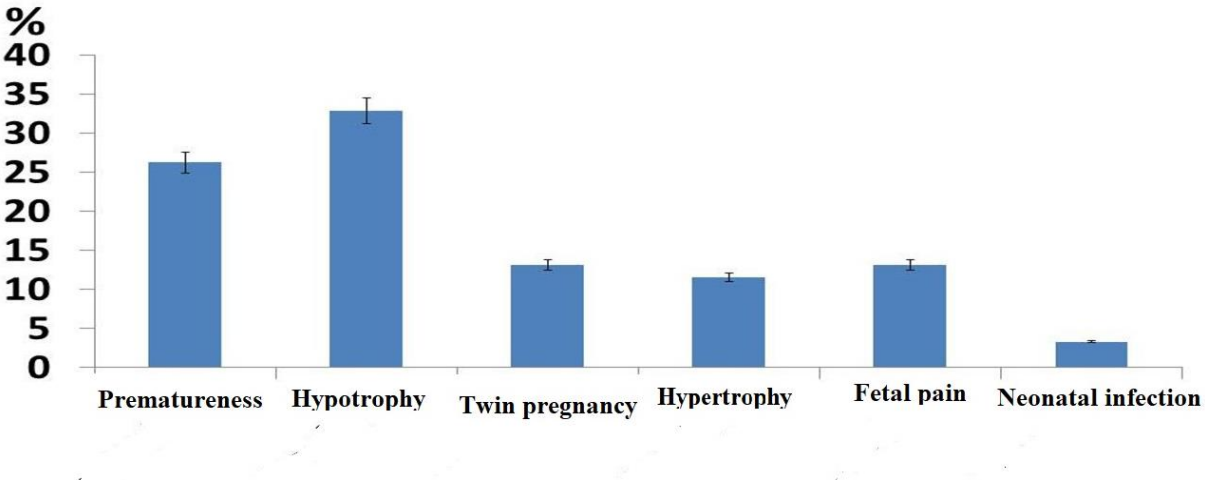

Figure 5: Distribution according to the alleged causes

Indeed, figure 6 presents the types of hypoglycemia and the transitional type dominates that the persistent type in the newborn in the study environment.

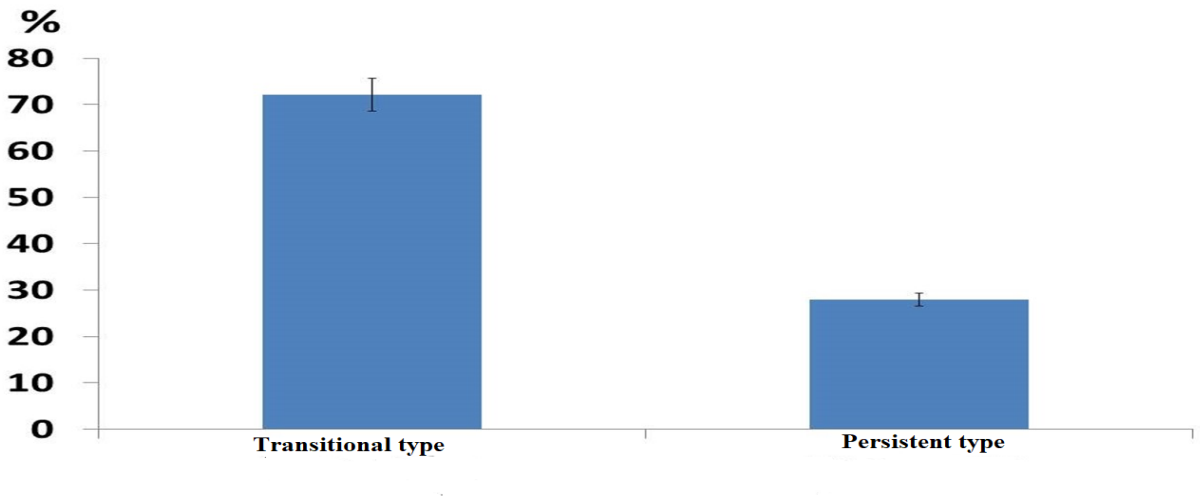

Figure 5: Types of hypoglycemia

Figure 7 presents the distribution of symptoms of hypoglycemia: hypotonia, drowsiness, serious discomfort and coma dominate, then pallor, flush and hypothermia then still polypnea, respiratory break and tachycardia, and again the abnormal cry, irritation, abnormal movements and convulsion and at the end, difficulty in food and vomiting.

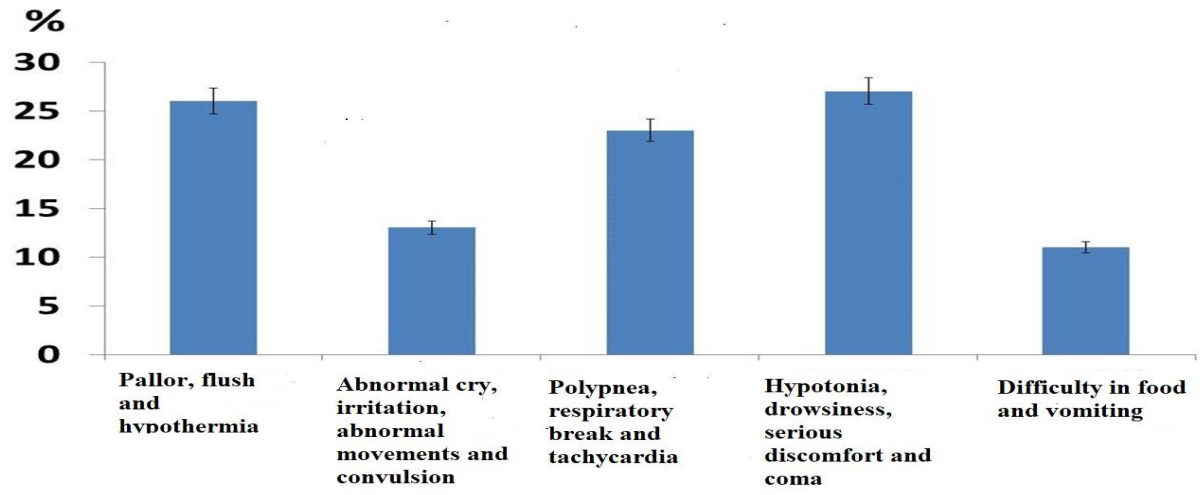

Figure 7: Distribution according to symptoms

The distribution of hypoglycemia according to the day of appearance is presented in figure 8 which shows that the appearance is observed after three days.

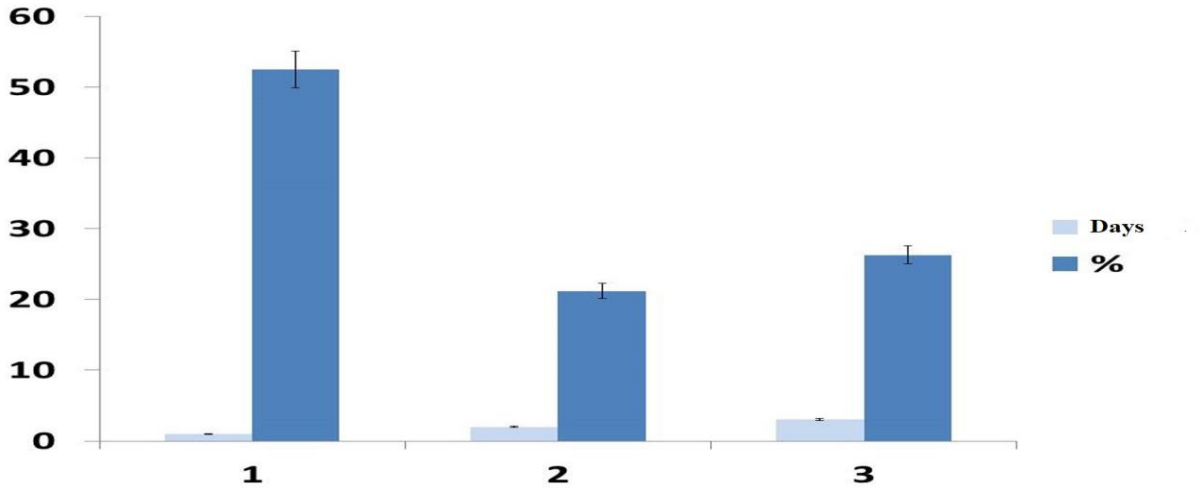

Figure 8:Distribution according to the day of appearance

IV. DISCUSSION

In this study 58.6% babies were males and 41.4% were females. Similarly, Saqib M et al [13] reported that out of all babies 66.5% were males and 33.5% were females. Pre-gestational and gestational diabetic incidence continues to rise all around the world [14].Accordingly, it is estimated that morbidities of the neonates neonatal like hypoglycemia, will also rise. The impacts of the prompt breast feeding on the neonatal hypoglycemia and the maternal long-term advantages are strongly linked to earliest start of breast feeding (particularly in diabetic mothers) [15] and [16]. However it is observed that the neonatal hypoglycemia of babies born to diabetic mothers can be corrected by early breast-feeding [16].

The great multiparous is the most important cause of cases of hypoglycemia with a rate of 55%, this would be explained by the fact that a large number of children does not allow the mother to take care of newborn and it does not have many reserves to save the fetus. The association of grand multiparity and poor pregnancy outcome has not been consistent for decades. Classifying grand multiparous women as a high-risk group without clear evidence of a consistent association with adverse outcomes can lead to socioeconomic burdens to the mother, family and health systems[17].

The high frequency of hypoglycemia is explained by the fact that, being an under-equipped country, the country suffers from a lack of equipment and infrastructure and poor monitoring of pregnancy during the 3rd trimester. Hypotrophy was found to be the most important cause of hypoglycemia, accounting for 32% of all cases. According to the UN World Health Organization (WHO) more than 220 million people worldwide have diabetes, from which more than 70% live in low- and middle income countries. It is expected that the number of diabetic subjects grows to 366 million by 2030, a figure that is more than twice the number in 2000. Epidemiologic evidences suggest that unless effective preventive measures are implemented the global prevalence will continue to rise [18].

The transitional type dominates that the persistent type in the newborn in the study environment. 27% of newborns presented persistent hypoglycaemia for several hours because they had not received anti-hypoglycemic treatment in time. Neonatal hypoglycemia, defined as a plasma glucose level of less than 30 mg/dL (1.65 mmol/L) in the first 24 hours of life and less than 45 mg/dL (2.5 mmol/L) thereafter, is the most common metabolic problem in newborns [19]. Persistent or recurrent hypoglycemia can result in neonatal permanent brain injury, leaving cognitive impairment, vision disturbance, occipital lobe epilepsy, cerebral palsy and other sequelae. NHBI has not yet been well understood by some clinicians, no diagnostic criteria have been available for NHBI due to the lack of specific clinical manifestations, although brain imaging studies are now an important diagnostic and prognostic tool, so it is also of necessity to establish criteria for its diagnosis [20] and [21].

77% of newborns presented symptoms of hypotrophy, drowsiness, severe malaise and coma. More than half of newborns have hypoglycemia on the first day of their life, a rate of 52.5%. The rate is the same for the hospital stay. A death rate of 14.8% was recorded and this is deplorable. Major long-term sequelae include neurologic damage resulting in mental retardation, recurrent seizure activity, developmental delay, and personality disorders. Some evidence suggests that severe hypoglycemia may impair cardiovascular function [19].

V. CONCLUSION

Neonatal hypoglycemia is a common complication among preterm infants, small-for-gestational-age infants, and infants of diabetic mothers. Newborn hypoglycemia is an extreme emergency. Prevention and correction must be rapid, effective, and controlled because they risk worsening and causing neonatal death or even irreversible brain damage. This constitutes an interest in the prevention of newborns at risk.

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