



Serum Calcium Status of Neonates with or without convulsion in a tertiary care hospital

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Abstract

Background: Neonatal convulsion is a paroxysmal alteration in neurologic function, i.e. behavioral, motor, autonomic functions, either one or all three, occurring within 28 days in age. It is a common neurological disorder in neonates. Behind this convulsion metabolic derangement is one of the common reasons. Among metabolic abnormalities, hypocalcaemia is most common followed by hypoglycemia and hypomagnesaemia.

Objectives: The present study was carried out to assess serum calcium status of neonates with convulsion, where no obvious cause of convulsion was found.

Methodology: This study was carried out in neonatal care unit of Shishu (child) hospital, Jessore, from September 2018 to February 2019. A total number of 70 babies were studied with or without convulsion but had no history of fever, septicemia, meningitis, perinatal asphyxia, birth injury, CNS abnormalities. After a quick clinical evaluation and control of convulsion and before giving any specific treatment, serum calcium status was measured by colorimetric determination (O-CRE-SOL Phahalein complex) method. Neonatal hypocalcaemia is considered if serum calcium value less than 1.75 mmol/l (7mg/dl).

Results: Among a total seventy patients 31.43% had low calcium level i.e, less than 1.75 mmol/l (7mg/dl).

Conclusion: It is seen that hypocalcaemia is an important cause of neonatal convulsion due to primary metabolic abnormalities. So, early recognition & treatment could save these babies from long term neurological sequel.

Keyword: Neonate, Convulsion, Hypocalcaemia.

Introduction

Neonatal convulsion is a paroxysmal alteration in neurologic function, i.e. behavioral, motor,

autonomic functions, either one or all three, occurring within 28 days in age¹. It is a common neurological disorder in neonates. The

manifestations of neonatal convulsion are extremely subtle. Horizontal deviation of eyes, fixed open stare, blinking and alteration of respiratory rate including apnea can be manifestations of neonatal convulsion².

As many as 20% newborn in intensive care unit may have seizure activity at some time³. Presence of seizure does not constitute a diagnosis but it is a symptom of an underlying central nervous system (CNS) disorder due to systemic or biochemical disturbances⁴. Biochemical disturbances occur frequently in the neonatal convulsion. In their presence, it is difficult to control seizure and there is a risk of further brain damage. Early recognition and prompt treatment of biochemical disturbance is essential for optimal management and satisfactory long term outcome³. Different types of biochemical abnormalities can cause seizure like hypocalcaemia, hypoglycemia, hypomagnesemia, hypernatremia, hyponatremia, hyperbillirubinemia etc⁵. Among primary metabolic abnormalities, that occur in patients with neonatal seizure, hypocalcaemia is the most common followed by hypoglycemia and hypomagnesemia³. Hypocalcaemia is defined as total serum calcium levels of less than 1.75 mmol/l(7mg/dl)⁴. Though several studies on the association with neonatal convulsion had been carried out in our country but very few references exist with that of serum calcium. So it is important to measure serum calcium status in neonates with convulsion, who had not any apparent reasons of convulsion. It is important to know as because early recognition and treatment can significantly influence the better outcome of neonates with convulsion.

Materials and Method

This study was carried out in neonatal care unit of Shishu (child) hospital, Jessore, over 6 months period from September 2018 to February 2019. A total number of 70 babies were studied with or without convulsion but had no history of fever, septicemia, meningitis, perinatal asphyxia, birth injury, CNS abnormalities. Consent was obtained

from all parents. Detailed history was taken about present illness. Antenatal, natal & postnatal history, socioeconomic history, family history regarding consanguinity of marriage between parents, affection of previous sibs, family history of epilepsy were taken very carefully. A thorough physical examination was done in every neonate. Convulsion was treated by per rectal diazepam (0.5mg/kg). Then 3ml of venous blood was collected as soon as possible for the measurement of serum calcium along with other routine investigations. Serum calcium was measured by colorimetric determination (O-CRE-SOL Phahalein complex method) in the Biochemistry department. Neonatal hypocalcaemia is considered if serum level is less than 1.75 mmol/l(7mg/l).

Results

Among seventy patients 57.14% (40) were male and 43.86% (30) were female. 71.43% were within 1st 5 days and remaining 28.57% were between 6-28 days. Among total patients 50% (35) were with convulsion and 50%(35) were without convulsion. Among total 70 patients 31.43% had low calcium level i.e. less than 1.75 mmol/l (7mg/dl).

Table 1: Presentation of biochemical abnormalities with convulsion and without convulsion

Total number	No. of Hypocalcaemia	Percentage of Hypocalcaemia
70	22	31.43%

Table 2: Number and percentage of patient with convulsion & without convulsion

No. of patients with convulsion	No. of patients without convulsion
35 (50%)	35 (50%)

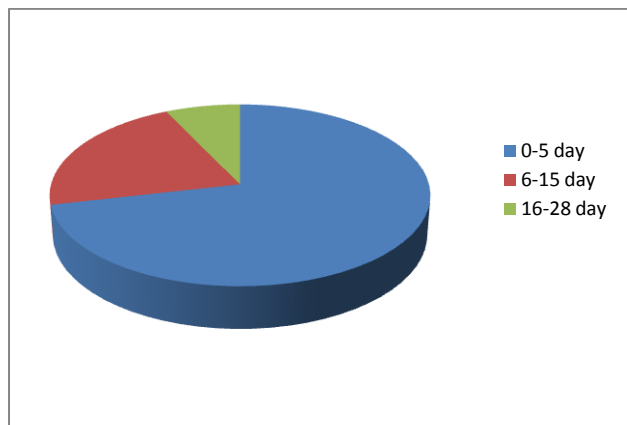


Fig.1: Age distribution of patients

Among seventy patients 50 (71.43%) were within 1st 5days, 15(21.43%) were within 6-15 days and 5 (7.14%) were within 16-28 days.

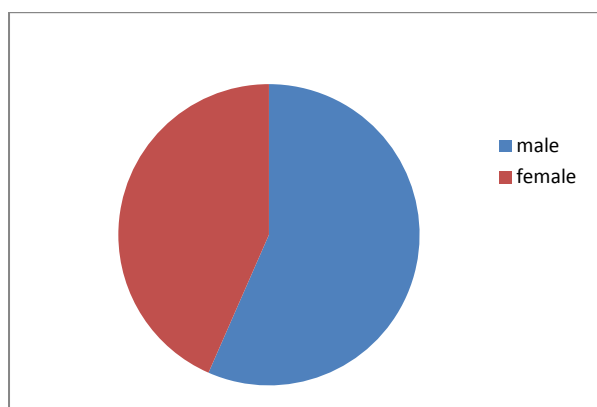


Fig.2: Sex incidence of patients.

Among seventy patients 57.14% (40) were male & 43.86% (30) were female.

Discussion

In this study, the neonates with or without convulsion were studied. Kumar et al⁶ in a study showed that primary metabolic disorder accounted for 25% cause of neonatal convulsion. In a study which was carried out over 2 years period on neonatal convulsion by Cockburn et al⁷, it was found that 55% of neonatal convulsion were due to primary disturbances of mineral metabolism. Metabolic cause of convulsion is common in Bangladesh due to delayed and infrequent breast feeding, faulty feeding practices. This is in contrast to report from Western countries where improvement in infant feeding practices has made this category as uncommon cause of seizure⁶.

Among primary metabolic abnormalities in neonates, hypocalcaemia is most common⁸. Hypocalcaemia is common between 12-17 hr. of life, specially in premature infants, in infant with asphyxia at birth and infants of diabetics mother (early neonatal hypocalcaemia). Stoliar et al studied 115 neonates with seizure, which showed significantly higher incidence of hypocalcaemia in full term and premature infants⁹. Jajoo et al showed that in 13 out of 35 infants with convulsion had serum calcium level 7.5mg/dl¹⁰.

Conclusion & Recommendations

From the study it is revealed that hypocalcaemia is common among neonatal seizure due to primary metabolic abnormalities, where no cause of seizure is identified. So early recognition and treatment could save these babies from long term neurological sequelies. Further studies with large sample size covering both urban and rural population will give more information about the biochemical changes in neonatal convulsions in our country.

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