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Biochemical Abnormalities in Neonatal Seizures.

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Abstract:
Objective:*The presence of seizure does not constitute a diagnosis but it is a symptom of underlying central nervous system disorder due to systemic or biochemical abnormalities. Early recognition and treatment of biochemical abnormality is essential for management and satisfactory long term outcome.*
Methods:
The present study was conducted in tertiary centre, RIMS, Ranchi from January 2016 – December 2016 on 59 neonates. Biochemical abnormality was seen in 29 neonates (49.15% of cases.)
Results:*Primary metabolic abnormalities occurred in 10 (16.94%) cases of neonatal seizures, most common being hypocalcaemia, followed by hypoglycaemia and hyponatremia. Biochemical abnormalities were seen in 19 cases (38.77%) of non-metabolic seizures in neonates. Associated metabolic abnormality were observed more often with hypoxic ischemic encephalopathy (HIE) cases and hypoglycaemia was most common in this group.*
Conclusion*:The most common biochemical abnormalities was hypocalcaemia and hypoglycaemia. None of the neonate had hyponatremia and hyperkalaemia.*
Keywords: *Neonatal seizures, hypocalcaemia, hypoglycaemia, Hypoxic ischaemic encephalopathy,*

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I. Introduction.

Neonatal seizures has always been topic of interest for paediatrician. Neonatal seizures is common neurological problem in neonatal period with frequency of 1.4 – 14/1000 population. It is a symptom of underlying central nervous system disorder either due to systemic or biochemical abnormalities. Biochemical abnormality occur either as underlying cause or associated abnormality. In their presence it is difficult to control seizures and there is risk of brain damage. Early diagnosis and management is essential for satisfactory long term outcome. The aim of this study was to determine biochemical abnormality in neonatal seizures.

II. Methods

Present study was conducted in RIMS, Ranchi, in its neonatology unit from Jan 2016 – Dec 2016. All children during first 28 days of life who were brought with H/O seizures or those who were hospitalised and developed seizures during their stay in the hospital were included in this study.

Detailed history was taken in each case like occurrence of first seizures, duration of seizures, type of seizures, and number of seizures. Antenatal, natal and postnatal risk factor like maternal diabetes, perinatal asphyxia, prolonged rupture of membrane, preterm delivery, traumatic delivery, small for date babies, low birth weight babies, sepsis, intracranial bleed, hyperbilirubinaemia.

Seizures were classified as focal, clonic, tonic, myoclonic, subtle. Venous blood was collected as soon as possible before instituting therapy for serum level of calcium, sodium, potassium, and blood glucose.
The criteria for diagnosis of various biochemical abnormalities are as follows.
Hypocalcaemia (calcium< 7.0 mg/ dl)
Hyponatremia(sodium< 130 meq/lt)
Hypernatremia (sodium > 150 meq/lt)
Hypokalemia(potassium< 3.5 meq/lt)
Hyperkalemia(potassium> 5.5 meq/lt)
Hypoglycaemia (blood glucose < 30 mg/dl in term and < 20 preterm neonates in first 72 hours and < 40 mg/dl after 72 hours of life.)

Calcium level was determined by precipitation method. Sodium and potassium level by flame photometry and blood glucose by glucose oxidase method.

III. Results

Out of 59 neonates who developed seizures, 29 neonates (49.15%) showed one or more metabolic 6abnormalities.

10 neonate had primary metabolic seizures and 19 neonate had biochemical abnormality associated with hypoxic ischaemic encephalopathy, intracranial bleed, and intracranial infection.

Out of 10 neonate who had primary metabolic abnormality, 4 were preterm and 6 were term neonate. Hypocalcaemia was commonest abnormality observed in neonates with primary metabolic seizures seen in 6 cases, early onset hypocalcaemia was seen in 4 cases and late onset hypocalcaemia was seen in 2 cases. Calcium level ranged from 6.4 – 6.7 mg in preterm (mean 6.5 mg %) and in term 6.4 -6.8 mg (mean 6.2 mg %).

Hypoglycaemia was second common abnormality seen in 4 babies, H/O maternal diabetes was present in 2 cases and remaining 2, 1 was small for date and other was preterm.

Serum value of sodium, potassium, were normal in all neonate having primary metabolic seizure.Metabolic abnormalities were present in 19 neonates (38.77%) in addition to known non metabolic causes. Metabolic abnormalities were observed more often in HIE, 11 out of 19 cases and hypoglycaemia was most common in this group(47.82%).

In HIE hypoglycaemia was common followed by hypocalcaemia and hyponatremia.

IV. Discussion

Etiology of neonatal seizures is not disease specific and sick neonate may present seizures due to combination of abnormalities. Asphyxia is a common cause of neonatal seizures and includes HIE, intracranial haemorrhage, infection, hypoglycaemia, hypocalcaemia. In present study, biochemical abnormalities were observed in 29 cases (49.15%).

Primary metabolic abnormalities were seen in 10 neonates and hypocalcaemia was observed in 6 (60%) cases and hypoglycaemia in 4 neonate (40%).

19 neonate had metabolic abnormalities in addition to non-metaboliccauses . 11 out of 19 neonate had HIE. And hypoglycaemia being common in this group.

Kumar et al studied 35 neonate for biochemical abnormality, in 22 (62.8%) of the cases , hypocalcaemia was seen in 7 (31.8%) , hypoglycaemia in 11(50%), hypomagnesaemia in 3 (13.63%)cases. Our study and study conducted by Kumar et al showed one similarity that biochemical abnormalities were seen in cases of hypoxic ischaemic encephalopathy, intracranial bleed, infection and metabolic disorder. Hypocalcaemia and hypoglycaemia were most common metabolic abnormality detected by Kumar et al which is in concordance with present study.

V. Conclusion

Primary metabolic abnormalities occurred in 10 cases (16.94%) of neonatal seizures most common being hypocalcaemia followed by hypoglycaemia. Biochemical abnormalities were seen in 19(38.77%) cases of non-metabolic seizures in neonates. Associated metabolic abnormalities were observed most often with hypoxic ischaemic encephalopathy 11 out of 19 cases and hypoglycaemia was most common in this group.
No infant had hyponatremia or hyperkalemia.

References

[1]. Mizrahi Eli M. Neonatal Seizures and neonatal epilieptic syndromes. Neurologic clinics in epilepsy. 2001; 19 (2) : 427-456. [CrossRef]

[2]. Neurological disorders. In : Singh M. Textbook of care of new born 5th ed., New Delhi: Sagar publication, 1999 : 340-344.

[3]. Pleasure David, Daryl C. De Vivo. The Nervous system. In : Rudolph text book of pediatric. Colin D. Rudolph, Abraham D., Margaret K., Hostellter, 21st ed., New York: McGraw Hills, 2002: 2267.

[4]. Levene M. Clinical conundrum of neonatal Seizures. Arch dis child fetal neonatal 2002; 86 (2): 75-77. [CrossRef] [PMC free article]

[5]. Mizrahi EM, Kellway P. Characterization and classification of Neonatal Seizures. Neurology. 1987; 37: 1837-1844. [CrossRef]

[6]. Holden KR , Mellitus D and Freeman JM. Neonatal Seizures: Correlation of prenatal and perinatal events with outcome. Pediatrics. 1982; 70: 165-176. [PubMed]

[7]. Du Pliessis AJ. Neonatal Seizures. In: Cloherty John P. Eichenwald EC and stark AR eds., Manual of neonatal care 5th ed., Philadelphia: Lippincott Williams & Wilkins, 2004: 507-522.

[8]. Ross AL ,Lomorso C. Neonatal Seizures state: A study of clinical, Pathology and electrographic features in 137 full term babies with a long term follow up. Pediatrics 1970; 45 : 404-425.

[9]. Soni A, Sabarawal AK, AmitaKet al. Clinical profile of Seizures in neonatal intensive case unit In: Manual abstract of XXIII Annual convention of national neonatology forum. 2003; P43 : 109-110.

[10]. Sood A, Grower N and Sharma R. Biochemical abnormalities in neonatal Seizure. Indian J Pediatric; 70 (3): 221-224. [CrossRef] [PubMed]

[11]. Kumar A, Gupta V, Kacchawaha and singla. A study of biochemical abnormalities in neonatal Seizure. Indian Pediatrics. 1995; 52: 424-427.

[12]. MargretteErriscon ,Zeltersfrom R. Neonatal convulsion. Incidence and causes in Stockholm area. ActaPediatr Scand. 1979; 68: 807-811.

[13]. Painter MJ, Bergmann I and Cumrine P. Neonatal Seizures. Padiatrclin North Am 1986; 33 (1) : 91-105. [CrossRef]
[14]. Legido A, Clancy RR, Berman PH. Neurologicaloutcome after electrographically proven neonatal seizures. Pediatrics 1991; 88(3): 583-596. [PubMed]
[15]. Scher MS, Aso K, Beggarly ME et al. Electrographic Seizures in preterm and full term neonate: clinical correlate, associated brain lesions and Risk factor neurological sequel. Pediatrics. 1993; 91: 128-134. [PubMed]
[16]. Coen RW, McCutchen CB, WarmaDet al. Continuous monitoring of electroencephalogram following perinatal asphyxia. J. Pediatr 1982; 100 : 628-630. [CrossRef]
[17]. Brown JK, Cockburn F and Forfur JO. Clinical and chemical correlate in convulsion of new born. Lancet. 1992; 1:135-138.
[18]. Ronen GM, Penney S and Andrew W. The epidemiology of clinical Neonatal Seizures in new foundland - A population based study. J. Pediatric. 1999; 134: 71-75. [CrossRef]

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