



ETIO-CLINICAL PROFILE OF NEONATAL SEIZURES IN TERM NEWBORNS

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ABSTRACT

Background: Neonatal seizures or neonatal convulsions are epileptic fits occurring from birth to the end of the neonatal period. Neonatal seizures are a common neurological problem with a frequency of 1.5-14/1000 neonates. Identification of etiology will help in management there by reducing morbidity and mortality of neonatal seizures.

Materials and Methods: This prospective study was done in NICU of SreeBalaji Medical College and Hospital, Chrompet, Chennai from Jan 2017 to Jun 2017. Term neonates with clinically identifiable seizure were included in this study. Appropriate investigations were done for the term neonates with seizures.

Results: In this study, of the 46 term neonates, 25(54.3%) were males and 21(45.6%) were females. Hypoxic Ischaemic Encephalopathy (HIE) (29%) was the most common cause of neonatal seizures. The most common type of seizures was subtle seizures.

Conclusion: Perinatal asphyxia was the most common cause for neonatal seizures in term neonates, followed by septicaemia and metabolic disturbances.

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INTRODUCTION

Neonatal seizures or neonatal convulsions are epileptic fits occurring from birth to the end of the neonatal period.¹ Neonatal seizures are a common neurological problem with a frequency of 1.5-14/1000 neonates. A seizure is defined clinically as a paroxysmal alteration in neurologic function, i.e. motor, behaviour and/or autonomic function.² Clinically, there are four seizure types: subtle, clonic, tonic, and myoclonic. Each one can be focal, multifocal, and generalized.³ Neonatal seizures (NS) are the most frequent and distinctive clinical manifestation of neurological dysfunction in the newborn infant. Infants with NS are at a high risk of neonatal death or neurological impairment/epilepsy disorders in later life. Improper and inadequate management of seizures could be one of the major reasons behind this phenomenon. Infants with neonatal seizures are at increased risk of morbidity and mortality.

The present study was conducted to determine the etiological factors for neonatal seizures in our hospital. The result of the study will help in planning management of neonatal seizure to improve the short term as well as long term outcome.

METHODS

This prospective study was done in NICU of SreeBalaji Medical College and Hospital, Chrompet, Chennai from Jan

2017 to Jun 2017. This study was approved by institutional ethical committee and written consent was obtained from parents of the studied neonates.

All the term neonates with clinically identifiable seizures before 28 days of life were enrolled in this study. Preterm neonates were excluded from the study. A detailed antenatal, natal, postnatal, and family history was obtained and documented in pre-designed proforma. Investigations like CBC, Blood culture and sensitivity, serum calcium, electrolytes, RBS, USG cranium, EEG were taken for appropriate term newborns with seizures.

Metabolic disorders were considered as hypoglycaemia (serum glucose <40mg/dl), hypocalcaemia (Total serum Ca <8mg/dl in full term.), and hypomagnesaemia (serum magnesium levels < 1.5 mg/Dl). The results were analysed by appropriate statistical methods.

RESULTS

In this study, 46 term neonates with seizures were included. 25(54.3%) were males and 21(45.6%) were females. 30(65.2%) neonates were between 37 to 39 weeks of gestation and 16 (34.7%) neonates were between 40 to 41 weeks of gestation. 24 neonates had normal vaginal delivery and 22 neonates were delivered by caesarean section.

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Table 1 Sex wise distribution of cases

Sex	Total	%
Male	25	54.3
Female	21	45.6
Total	46	100

Table 2 Distribution of cases according to type of seizures

Type of seizure	Number of patients	%
Subtle	20	43.4
Tonic	6	13
Clonic	16	34.7
GTCS	4	8.6
Total	46	100

Table 3 Distribution of seizures according to etiology

Aetiology of seizures	Number of patients	%
HIE	29	63
Hypoglycaemia	11	23.9
Hypocalcaemia	2	4.3
Intracranial Hemorrhage	1	2.1
TORCH	1	2.1
Infections	2	4.3
Congenital malformation	0	0
Total	46	100

The most common type of seizure was subtle (n=26, 56.5%); followed by Clonic (n=10, 21.7%); Tonic(n=6, 13%); GTCS(n=4, 8.6%). Among the studied newborns, HIE was identified as the most common cause of neonatal seizure (n=29, 63%) which was followed by hypoglycaemia (n=11, 23.9%), hypocalcaemia (n=2, 4.3%), Intracranial haemorrhage (n=1, 2.1%), TORCH infection(n=1, 2.1%), Infections(n=2,4.3%). Out of 46 newborns, 40 newborns responded to first line antiepileptic drugs and 6 newborns required second line antiepileptic drugs.

DISCUSSION

Neonatal seizures are a common neurological problem with a frequency of 1.5-14/1000 neonates². Etiologically, about 80-85% of neonatal seizures are symptomatic and rest are idiopathic.

24(52.1%) babies with neonatal seizure were born through the vaginal delivery and 22 (47.8%) babies were through the LSCS. This was found similar with the study done by Sabzehei MK *et al*³ In our present study, 25(54.3%) neonates were males and 21(45.6%) neonates were females with slight male predominance (Table 1). This finding is similar to the studies done by the Sahana G *et al*, Parvin R *et al* and Maoyedi AR *et al*.^{4, 5, 6}

The most common causes of seizures as per the recently published studies were hypoxic ischemic encephalopathy, metabolic disturbances (hypoglycaemia and hypocalcaemia), and meningitis.^{7, 8-12}

The most common type of seizures was subtle type in 20(43.4%) term neonates followed by clonic seizures in 6(13%) neonates, GTCS in 4(8.6%) neonates. This was found in concordance with the study done by Aziz A *et al* and Verma YS *et al*.^{13, 14}

In our study HIE was found to be the most common cause of neonatal seizures which is identified in 63% of neonates followed by hypoglycaemia in 11 (23.9%) term newborns. This was found in concordance with the study done by Aziz A *et al* and Verma YS *et al* (70%)^{13, 14}

CONCLUSION

In our study, HIE was the most common cause of neonatal seizures among term neonates. The most common type of seizures was subtle seizures. Early identification of at risk pregnancies, institutional delivery and aseptic precautions with timely resuscitation is recommended to reduce morbidity and mortality due to neonatal seizures.

References

1. Panayiotopoulos CP. The Epilepsies: seizures, syndromes and management. Oxfordshire (UK): Bladon Medical Publishing; 2005. Chapter 5, Neonatal Seizures and Neonatal Syndromes. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK2599/>.
2. Mizrahi EM, Kellaway P, editors. Diagnosis and management of neonatal seizures. Lippincott-Raven, 1998. p. 15-35.
3. Sabzehei MK, Basiri B, Bazmamoun H. The Etiology, Clinical Type, and Short Outcome of Seizures in Newborns Hospitalized in Besat Hospital/Hamadan/ Iran. *Iran J Child Neurol*. 2014;8(2):24-8.
4. Sahana G, Anjaiah B. Clinical profile of neonatal seizures. *Int J Med Appl Sci*. 2014;3(1):21-7.
5. Parvin R, Afmsalim, Rahman M, Chowdhury K, Sultana A, Ahmed S, *et al*. Neonatal seizures: correlation between clinico-etiological profile and eeg findings. *Bangladesh J Child Health*. 2014;38(1):19-23.
6. Moayedi AR, Zakeri S, Moayedi F. Neonatal seizure: etiology and type. *Iranian J Child Neurol*. 2008;2(2)23-
7. Volpe JJ, editor. Neurology of the newborn. 5th ed. Philadelphia: SaundersElsevier, 2008. p.203-44.
8. Painter MJ, Scher MS, Stein MD, Armatti S, Wang Z, Gardner JC, *et al*. Phenobarbitone compared with phenytoin for treatment of neonatal seizures. *N Engl J Med* 1999; 341:485-9.
9. Rennie JM. Neonatal seizures. *Eur J Pediatr* 1997; 156:83-7.
10. Laroia N. Controversies in diagnosis and management of neonatal seizures. *Indian Pediatr* 2000;37:367-72.
11. Iype M, Prasad M, Nair PM, Geetha S, Kailas L. The newborn with seizures – a follow-up study. *Indian Pediatr* 2008; 45:749-52.
12. Kumar A, Gupta A, Talukdar B. Clinico-etiological and EEG profile of neonatal seizures. *Indian J Pediatr* 2007; 74:33-7.
13. Aziz A, Gattoo I, Aziz M, Rasool G. Clinical and etiological profile of neonatal seizures: a tertiary care hospital based study. *Int J Res Med Sci*. 2015;3:2198-2203.
14. Verma YS, Dutt R, Rajput N, Patil R. Predictive value of EEG for neurodevelopmental outcome in neonatal seizures. *J Evol Med Dent Sci*. 2013;2(29):5417-25.
