A PROSPECTIVE STUDY ON SEIZURES AMONG PEDIATRIC AGE GROUP IN TERTIARY CARE HOSPITAL

Pediatrics

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ABSTRACT

Seizures represent signal of neurological disease in the newborn period and these convulsive phenomena are the most frequent of the overt manifestation of neonatal neurological disorders. The objective of this study was to study the incidence of pediatrics (0-12 years) seizures. To study the etiology and pattern of seizures. **Methods:** 200 Subjects who had seizures were included in the study. Relevant history was ascertained from a patient's parents or a reliable relative or attendant, medical records and the referring physicians note, specifically from mother in case of neonatal seizures i.e. age at onset of seizures, seizure activity with special emphasis on occurrence of 1st seizures, duration of seizures, number and type of seizures, associated autonomic changes, medications required to control seizures, response time to medications, and possible causes for determination of etiology. A detailed antenatal, natal and postnatal history was taken. **Results:** Out of 200 study subjects 35.89% were in neonatal age group, of which 64.10% and 35.90% were male and female respectively and 64.11% out of neonatal seizures, 64.10% neonates were male and 35.90% were female. Male: Female ratio was 1.79:1. The seizures were common in male neonates. Subtle seizures were the commonest type of seizures observed both in term and preterm neonates. **Conclusions:** The various types of seizure were compared with the preterm and term neonates and it was found statistically significant

KEYWORDS

seizure, term, preterm, etiology, pattern of seizure

1. INTRODUCTION

Neonatal seizures are the most common cause of mortality and morbidity encountered in neonatal intensive care unit. Recognition and classification of neonatal seizures remain problematic; particularly when pediatricians rely only on clinical criteria. Seizures in a newborn are one of the few neonatal neurological emergencies where prompt diagnostic and therapeutic plans are necessary; a delay in therapy results in poor neurological outcome. Seizures during the neonatal period are relatively common, occurring in approximately 1.8 to 3.5 per 1000 live births with greater frequency in premature or low birth weight babies as compared to term babies. In the newborn, seizures are always due to an underlying cerebral or biochemical abnormality. In the neonatal intensive care unit, the incidence goes as high as 10 to 25%, out of which about 15% will die and 35 to 40% will have major neurological sequel. Most convulsions under the age of 5 years will be due to fever. The most common convulsive disorder of early childhood is febrile seizures. Febrile seizures still remain a controversial topic so far as their cause, significance and treatment are concerned. It is precipitated by fever arising from infection outside the nervous system. Febrile seizure is a common disorder affecting 2-4% of children before 5 years of age. Febrile seizures are slightly more common in boys. Complex febrile seizure which may be focal or generalized and the seizure lasts greater than 15 minutes or there are multiple seizures within same febrile illness. Epilepsy tops the list of chronic neurological disorders in all geographical regions of the world. Its prevalence is higher in developing countries like India due to intracranial infections, perinatal birth asphyxia, birth injuries, head trauma, etc. Less than one third of seizures in children are caused by epilepsy, a condition in which seizures are triggered recurrently from within the brain. The cumulative lifetime incidence of epilepsy is 3%; more than half of cases begin in childhood. The incidence of epilepsy in developing countries is near 18/1000 population as compared to 2.7-8/1000 population in developed countries. The objective of this study was to study the incidence of pediatrics (0-12 years) seizures and to study the etiology and pattern of seizures.

2. METHODS & MATERIALS

The present study was designed as a prospective observational study conducted in a tertiary care centre, Government Medical College, Salem, Tamilnadu. 200 Subjects who had seizures were included in the study. Inclusion criteria Pediatric patients, aged between 0 to 12 years and of either sex who presented with history of seizures with any etiology and those who are willing to participate in the study.

EXCLUSION CRITERIA

- Seizure cases who went discharge against medical advice
- Neonates with doubtful seizures

- Seizure cases who expired immediately after hospitalization (before diagnosis)
- Not willing to give consent.

Ethical clearance was obtained from Institutional Ethics Committee. An informed written consent was taken from the relatives of the subjects who were enrolled in the study and all the information obtained was strictly kept confidential. Study subjects (aged between 0 to 12 years) were recruited both from NICU and pediatric ward, consecutively hospitalization of pediatric patients, and of either sex who presented with history of seizures. Relevant history was ascertained from a patient's parents or a reliable relative or attendant, medical records and the referring physicians note, specifically from mother in case of neonatal seizures i.e. age at onset of seizures, seizure activity with special emphasis on occurrence of 1st seizures, duration of seizures, number and type of seizures, associated autonomic changes, medications required to control seizures, response time to medications, and possible causes for determination of etiology. A detailed antenatal, natal and postnatal history was taken. In cases beyond the neonatal age, the data also included demographic details, history of fever, duration and type of seizure, repetition of seizure within 24 hours. History of epilepsy and anti-epileptic drug use, seizure type, duration of seizures level of consciousness, as well as relevant past history and family history. Investigation data, treatment and outcome were also collected. All the investigations were carried out as per standard guidelines.

3. RESULTS

All seizure cases admitted during above time period were studied to know the incidence, type and etiology. Out of 200 study subjects 35.89% were in neonatal age group, of which (64.10%) 35.90% were male and female respectively. The incidence of neonatal seizures was 12.66%, while the incidence beyond neonatal age group up to 12 years was 6.46% Male: Female ratio was 1.79:1. The seizures were common in male neonates. Subtle seizures were the commonest type of seizures observed both in term and preterm neonates. The various types of seizure were compared with the preterm and term neonates and it was found statistically significant. Metabolic abnormalities, hypocalcaemia was seen within 1st to 7th day of life in 10 out of 13 i.e. 77% neonates while as 10 out of 11 i.e. 99.9% hypoglycemia cases were within 1st to 7th day of life. So most of the metabolic abnormalities were seen after 24 hours of life. The various causes of seizure were compared with the preterm and term neonates and it was found statistically significant. The incidence of febrile seizures was maximum in the age group of 1 year to 3 years with 44.58%. When chi square for linear trend test was applied for up to the age of 3 years it was found statistically significant.

4. DISCUSSION

The overall incidence of neonatal seizures in present study was found to be 12.66%. The incidence of neonatal seizures reported by deferent authors are as follows, Sandhu R et al.9 studied 80 neonates and his incidence was 14.2%. Grover N studied 59 neonates and his incidence was 1.5%-14%.10 Kumar et al studied 25 neonates and found incidence as 12.4/1000 live birth. Taksande AM et al studied 110 neonates and found 16.69% Of incidence. Noreen Faiz et al studied 101 neonates and his incidence was 18.6 % Similar results were also observed in study conducted by Holden et al and Powell et al.14,15 Holden et al studied 227 neonates of which 157 (56.77%) neonates were male and 120 (43.32%) neonates were female. Powell et al studied total of 24 cases of which 17 (70.83%) were male neonates and 7 (29.16%) were females neonates. Scher MS et al in his study of 92 neonates also observed a 50 (54.35%) of male neonates suffering from seizures in comparison to 42 (45.65%) of female neonates.16 Taksande AM et al in his study of 110 neonates of which 73 (66.4%) neonates were male and 37 (33.6%) neonates were female. In this study, full term neonates were 83 (71%) and 34 (29%) neonates were preterm. The term neonates showed predominance for seizure activity. The possible higher incidence in term neonates can be explained by the fact that most of the neonates in this group were intrauterine growth retardation (IUGR). The incidence of birth asphyxia is higher in IUGR neonates; this might be a contributing factor for the high incidence of seizures in this group. Similar findings were also observed in the study conducted by Legido, Clancy and Berman et al and Kumar et al, Legido et al studied 40 neonates out of which 28 (70%) were term neonates and 12 (30%) were preterm neonates and Kumar et al studied 35 neonates, out of which 30 (85.71%) neonates were term neonates. In our study, 48.20% neonates had birth asphyxia, 28.84% neonates had infection, and 1.20% neonate had intra-ventricular hemorrhage followed by hypocalcaemia in 12.04% neonates, hypoglycemia in 8.43% neonates. Among preterm 32.35% neonates had birth asphyxia, 23.53% neonates had infection. Intraventricular hemorrhage (IVH) was seen in 20.58% neonates followed by hypocalcaemia in 8.82% neonates, hypoglycemia in 11.76% neonates. The similar result was also shown by Eriksson studied 77 neonatal seizure cases out of which 48% were due to birth asphyxia. Legido A, et al studied 40 neonatal seizure cases out of which 35% were due to birth asphyxia. Taksande AM studied 110 neonatal seizure cases out of which 42.7% were due to birth asphyxia.12 Talukdar B et al studied 90 neonatal seizure cases out of which 44.44% were due to birth asphyxia. Twenty-four term neonates had infections, out of which 10.84% neonates had meningitis and 118% neonates had septicemia. In preterm group 20.58% neonates had septicemia and 2.94% neonate had meningitis. The diagnosis of septicemia was made on the basis of clinical signs and laboratory parameters. The comparative studies are Taksande AM, et al studied 110 cases of neonatal seizures out of which 28.2% were infectious origin.12 Talukdar B et al studied 90 cases of neonatal seizures and found only 7.78% as infectious origin. Mwaniki M et al studied 142 cases of neonatal seizures and found 60% of cases due to infection.20,21 In our study, 8 (6.83%) neonates had intra-ventricular hemorrhage out of which 1 (1.20%) neonate was term while 7 (20.58%) neonates were preterm. The incidence of intra-ventricular hemorrhage was higher in preterm neonates than term neonates. Periventricular or intraventricular hemorrhage is the most common cause of intracranial bleeding and neurological damage in low birth weight and preterm neonates. The similar result were also shown by studies conducted by Taksande AM et al out of 110 neonatal seizure cases 7(6.36%) neonates develop seizures due to IVH. Talukdar B et al studied 90 cases out of which 4 (4.44%) due to IVH. 12,20 Hypocalcaemia is one of the important metabolic causes of neonatal seizures. In the present study neonatal seizures due to hypocalcaemia was observed in 13 (11.11%) neonates, out of which 10 (76.92%) neonates were term and 3 (23.08%) neonates were preterm. Most neonates fed with the non-human milk have lower calcium and higher phosphate concentration on sixth day of life than breast fed neonates. This can be the possible cause for late onset seizures. The similar result were also shown by studies conducted by Kumar et al out of 35 neonatal seizure cases 14.28% were due to hypocalcaemia.18 Taksande AM et al out of 110 neonatal seizure cases 13 (11.81%) neonates develop seizures due to hypocalcaemia.12 Talukdar B et al studied 90 cases out of which 9 (10%) due to hypocalcaemia.20 Hypoglycemia occurs in both term and preterm neonates and particularly in neonates of diabetic mother. In this present study, hypoglycemia as a cause of neonatal seizures was observed in 11 (9.40%) neonates, out of which 7 (63.64%) neonates were term and 4 (36.36%) neonates were preterm. The similar result were also shown by studies conducted by Legido A et al out of 40 neonatal seizure cases

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REFERENCES

- Volpe JJ. Neonatal Seizures. In: Volpe JJ. Neurology of the newborn 4th ed. Philadelphia: W.B. Saunders; 2001:178-216.
- Scher MS. Controversies regarding the neonatal Seizures recognition and epileptic disorders. *J Neonat*. 2002;4(2):139-58.
- Eli M. Neonatal Seizures and neonatal epileptic syndromes. *Neurol Clin Epilep*. 2001;19(2):427-56.
- David P, De Vivo DC. The nervous system. In: Rudolph Colin D. Abraham D. Rudolph, Margaret K. Hosteltter, 21st ed. New York: McGraw Hills; 2002:2267.
- Hauser WA. The prevalence and incidence of convulsion disorders in children. *Epilepsia*. 1994;35(Suppl. S1-6).
- Offringa M, Moyer VA. Evidence based management of seizures associated with fever. *BMJ* 2001;323:111-14.
- Johnston MV. Seizures in childhood. Kliegman, Behrman, Jenson, Stanton. Nelson text book of paediatrics; 18th edition. Elsevier Philadelphia Sanders; 2008:2457.
- Senanayake N, Roman G. Epidemiology of epilepsy in the tropics. *Trop Geogr Neurol*. 1992;2:610-9.
- Sandhu R, Thakur P, Kesavamurthy SR. A clinical study of Seizures in Neonate. In: Manual abstracts of Pedicon. National conference of Indian Academy of Pediatrics. Mumbai: IAP 2003;Neo/52:203-4.
- Grover N. Biochemical abnormalities in neonatal seizures. In: Manual abstracts of Pedicon. National conference of Indian Academy of Pediatrics. Mumbai: IAP. 2003;Neo/10:175.
- Kumar A, Gupta A, Thakur NK. Clinical profile of Neonatal Seizures and there correlation with EEG in a referral neonatal unit. In: Manual abstracts of XXIII Annual convention of National neonatology Forum. 2003;32:90-1.
- Erriksson M, Zelterstrom R. Neonatal convulsion, incidence and causes in stockholm area. *Acta Paediatr Scand*. 1979;68:807-11.
- Taksande AM, Vilhekar K, Jain M, Lakra M. Clinico-biochemical profile of neonatal seizures. *Indian journal of pediatrics*. 1995;52:424-7.
- Faiz N, Malik M, Azam M, Afzal U. Etiology and types of neonatal seizures. *Ann Pak Inst Med Sci*. 2009;5(2):77-80.
- Holden KR, Mellitus ED, Freemann JM. Neonatal seizures: correlation of prenatal and perinatal events with outcome. *Pediatr*. 1982;70(2):165-76. 16. Powell C, Painter MJ, Pipeger CE. Primidone therapy in refractory seizures. *J Pediatr*. 1983;105:651-4.