



Prevalence of Seizures in Hospitalized Neonates

Sanjeev Kumar Digra, Ashok Gupta

Abstract

The present study was conducted in all neonates < 28 days of life who were hospitalized in the neonatal division, Department of Pediatrics, SMGS hospital, Govt. Medical College Jammu, over a period of 6 months from Dec. 2000 to May 2001 to assess the prevalence of neonatal seizures. The study revealed a seizure prevalence in hospitalized neonates of 19.2% with male sex preponderance. 71.4% neonates had early onset seizures.

Key words

Neonate, Seizure, Birth asphyxia

Introduction

A seizure is the most frequent sign of neurological dysfunction in the neonate (1,2). Seizures are not only more frequent in neonatal period they are also very difficult to diagnose because of subtle nature and EEG manifestation.

Experimental animal studies suggest that neonatal seizures may have a deleterious effect on the developing brain, depleting cerebral glucose levels, which in turn may interfere with DNA synthesis, glial proliferation, differentiation and myelination (3,4). The present study was done to determine the prevalence of seizures in hospitalized neonates.

Material & Methods

All neonates < 28 days of life who were hospitalized in the neonatal division, Department of pediatrics, SMGS hospital Jammu over the period of 6 months from Dec. 2000 to May 2001 were included in this study.

A seizure in neonate was defined as :(a) Subtle seizure when neonate had jerking of eyes, blinking or fluttering of eyelid, staring look, sucking, chewing or smacking oro-buccal movements or apnoeic attack.(b) Multifocal clonic seizure when neonate had clonic convulsive movements migrating haphazardly from one limb to

another.(c) Focal Clonic seizure when the neonate has a well localized clonic convulsions.(d) Tonic seizure when the neonate had generalized stiffening associated with stertorous breathing and occasional clonic jerks.(e) Myoclonic seizure when the neonate had sudden jerky movements.

Preterm baby was defined as a baby with a gestation of less than 37 completed weeks. LBW baby with a birth weight of less than 2500 gms (Up to & Includes 2499gm.) irrespective of the period of gestation.

Results

During the period of 6 months (from Dec, 2000 to May, 2001) 531 neonates < 28 days of age were admitted in Neonatology Division of pediatrics, SMGS hospital, Govt. Medical College Jammu. Out of them 102 neonates had seizures, making a prevalence of Neonatal seizures in hospitalized neonates to 19.2%.

Majority of the neonates 82.3% (84) were term with mean birth weight of 2.85kg (SD 0.36). Whereas only 17.6% (18) neonates were LBW with mean birth weight of 2.01kg (SD 0.28). These 18 LBW included 5 preterm

From the Department of Paediatrics, SMGS Hospital, Govt. Medical College, Jammu (J&K) India.

Correspondence to : Dr. Ashok Gupta, Professor & Head, Deptt. of Paediatrics, SMGS Hospital, Jammu-J&K-India.



with mean gestational age of 35 weeks and mean birth weight of 1.85kg.

There were 70.5% (72) males and 29.5 % (30) females with a Male : Female ratio of 2.4:1 and the number of male neonates with seizure continue to dominate at almost all ages.

Table 1

Birth wt. & Gestational age distribution of NNS.

B.wt& gestation	Total = 102		Mean B.wt in ks	Standard Deviation (SD)
	No	%ag		
Pt/LBW	18	17.6	2.01	0.28
Term	84	82.3	2.85	0.36

Majority of the neonates (45.09%) had seizures during first 24hrs. followed by 25.49% & 20.6% during next 24hr-72hr and 72hr-7days respectively. Only 2.94% neonates had seizures after 14 days of age.

Table 2

Age Distribution of Neonatal Seizures

Age	M	F	Total=102	%
< 24hr.	33	13	46	45.09
24 < 72hr	17	9	26	25.49
72hr<7day	17	4	21	20.60
7days<14days	3	3	6	5.88
>14 days	2	1	3	2.94
Total	72	30	102	

Majority of neonates 43.2% (44) had not received any feed or IV fluids before admission & 27.5% were exclusively top fed.

Table 3

Diagnosis vise Distributin of neonatal seizures

	Number (N=102)	%
B.Asphyxia	69	67.65
Diagnosis	4	3.92
Septicemia	12	11.76
I/c bleed	1	0.98
Kernicterus	3	2.94
Others	13	12.75

Majority of neonates (67.65) had history of birth asphyxia followed by 12.75% neonates who had no obvious clinical cause for seizures at admission. Septicemia alone, meningitis, kernicterus and intracranial bleed each accounted for

11.76%, 3.92%, 2.94% and 0.98% respectively at admission.

Majority 37.25% (38) neonates had multifocal clonic seizures followed by 26.47%, 23.52%, 12.74% subtle , tonic and focal clonic seizures respectively .None of the neonate had myoclonic seizures.

Discussion

Seizures are a significant problem in neonatal period. Their incidence is uncertain because many such episodes are difficult to recognize in newborn babies and non-epileptic events may be confused with seizures.(6,7) Mehraban Singh reported incidence of neonatal seizures from 0.5% to 0.8%.(5).

In a study done by J.H keen(8) the incidence of neonatal seizures was 11.2 and 7.1 per thousand live birth in two different hospitals which were significantly higher than the 2 per thousand in Burke's figures from Sheffield(9). In our study we found that the prevalence of seizures in hospitalized neonates was 19.2% which is comparable with the finding of Erikson etal (10) and Seay and Bray(11) who estimated that 20% neonates in intensive care units have evidence of seizure activity at some time.

In this study there is an over all male sex preponderance which is consistent with other studies. Cockburn et al, Fredrichsen and Mc intyre et al also reported male sex preponderance in their studies for which no plausible mechanism has been proposed (12,13,14). In Indian set up due to social beliefs male babies are cared better by their parents and are brought to the hospital even with minor complaints but female babies are usually neglected and are managed at home even if they are very sick. This can be one of the important factor in causing male sex preponderance in our study.

When the age distribution of neonatal seizures was observed in our study, it was found that 71.4% neonates had first seizure before 72 hours of age (i.e. early onset) and rest had onset after 72 hours which is similar to the findings of Erikson et al (10) who reported highest incidence of neonatal seizures on first and second day of life in their studies. This high incidence of early onset neonatal seizures in our study can be explained by the fact that birth asphyxia was the most dominant factor contributing towards neonatal seizures (in 67.6% of total



cases) followed by the infections (septicemia & meningitis) which is in line with Maharban Singh's (5) observation that in full term infants birth asphyxia and intracranial injuries together account for about half of the early onset seizures followed by the hypoglycemia, infections and hypocalcemia. Similar findings were reported by Craig (15) and Levene *et al* (16). Tekgul *et al* also reported global cerebral hypoxia ischemia or focal cerebral hypoxia ischemia as most common cause of Neonatal seizures (17).

In conclusion we found that in our study prevalence of seizures in hospitalized neonates was 19.2% with over all preponderance of male sex, early onset seizures and birth asphyxia.

References

- Laroya N. Current controversies in diagnosis and management of neonatal seizures. *Ind Pediatr* 2000 ; 36 : 367-71.
- Volpe JJ, Hill A. Neurological and neuromuscular disorders In. Neonatology – Pathophysiology and management of the new born, 5th Edn. Eds. Avery GB, Fletcher MA, Mac Donald MG. Lippincott, 1999 ; 1231-49.
- Varley H, Gowenlock AH, Bell M. The Plasma protein. In : Practical clinical Biochemistry. Vol. 1, 5th Edn. London, William Heienmann Medical books Ltd. 1980 ; PP 535-93.
- Yager JX, Shuaib A, Throhill J. The effect of age on susceptibility to brain damage in a model of global hemisphere hypoxia ischemia. *Dev. Brain Res* 1996 ; 93 : 143.
- Singh M. Neonatal Seizures. In : care of the new Delhi, Sagar Publications, 1999 ; PP 340-43.
- Boer HR. Neonatal Seizures a survey of current practice. *Clin Pediatr* 1982 ; 21 : 453-57.
- Volpe JJ. Neonatal seizures. *Lancet* 1989; 15: 135-137.
- Keen JH. Significance of hypocalcemia in neonatal convulsions. *Arch Dis Child* 1969 ; 44 : 356-61.
- Burke JB. The prognostic significance of neonatal convulsions. *Arch Dis. Child* 1954 ; 29 : 342.
- Eriksson M, Zetter Strom R. Neonatal convulsions. *Acta Pedict Scand* 1979 ; 68 : 807-11.
- Seay AR, Bray PF. Significance of seizures in infants less than 2500gms. *Arch Neurol* 1977 ; 34 : 381.
- Cock burn F, Brown JK, Forfar JO. Neonatal convulsions associated with primary disturbance of calcium, Phosphorus and magnesium metabolism. *Arch Dis Child* 1973 ; 48 : 99-108.
- Fredrichsen C. tetamy in a sucking infant with latent osteitis fibrosa in the Mother. *Lancet* 1939 ; 1 : 85.
- Mc Intyrel; Boss S, Troughton Va. Parathyroid hormones and magnesium homeostasis. *Nature* 1963 ; 198 : 1058-60.
- Craig WS. Convulsive movements occurring in the first 10 days of life. *Arch Dis Child* 1960 ; 35 : 336-44.
- Levene ML, Trounce JQ. Neonatal seizures towards more precise diagnosis. *Arch Dis Child* 1968 ; 61 : 78-87.
- Tekgul H, Gauvreau K, Soul J *et al*. The current etiologic profile and neurodevelopmental outcome of neonatal seizures in the current era of neonatal intensive care and to identify predictors of neurodevelopmental outcome in survivors. *Pediatrics* 2006 ; 117 : 1270-1280.

GUIDELINES FOR ARTICLES TO BE SUBMITTED UNDER EACH CATEGORY TO “JK SCIENCE” JOURNAL OF MEDICAL EDUCATION & RESEARCH

Article Type	Summary: No. of Words	Key Words: No. of Words	Text : No. of Words	Sub-Headings	Tables: Max. No.	Figures: Max. No.	No. of References
ED	NR	NR	600-800	NR	NR	NR	£ 10
RA	NR	NR	3000	Variable	2	2	30-35
OA	200	3-5	2000	Standard	4	2	20-25
SC	100	3-5	1200	Standard	2	1	10-15
CR	< 50	3-5	600-800	Standard	1	3	< 10
DR	NR	NR	1000	NR	1	1	< 10

ED = Editorial RA = Review Article; OA = Original Article; SC = Short Research Communication; CR = Case Report; DR = Drug Review; NR = Not Required