www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 83.27
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i7.229

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Article

A Study on Clinico-Radiological Profile of Children Presenting with Seizure in a Tertiary Care Hospital in Nepal: A Cross-Sectional Study

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Abstract
Objective: *To study the clinico-radiological profile of children presenting with seizure in a tertiary care hospital in Nepal.*
Methods: *This was a prospective cross-sectional study. Children presenting with seizures were included in the study. The children of either sex and aged 0-16 years were included in the study. Neuroimaging of all the children was done by computed tomography (CT) of head. Number of lesions were counted in CT scan of head and labeled as single or multiple. The findings were reported in the form GTCS, partial seizure and others.*
Results: *Out of the total 168 children with seizures, 138 (82.1%) had GTCS and 30 (17.3%) had partial seizures. GTCS was slightly higher among male children (82.7%) compared to females (81.2%). However, partial seizure was slightly lower among male children (17.3%) compared to females (18.8%). The percentage of GTCS and partial seizures was 80% and 20% in vesicular stage respectively. The percentage of GTCS and partial seizures was 89.5% and 10.5% in who fever was present. On CT scan, the percentage of GTCS and partial seizure was 86.3% and 13.7% respectively in whom NCC was found.*
Conclusion: *The study showed that seizure is one of the major causes of hospital admissions in children, particularly in the children. Febrile seizure is the most common cause of seizure in children and majority of them have generalized form of seizure. Seizure control with single drug, seizure without recurrence and idiopathic seizure are favorable prognostic factors.*
Keywords: *Seizure, Clinical, Generalized tonic-clonic seizure, Partial seizure.*

INTRODUCTION

Seizure is one of the common causes of childhood hospitalization with significant mortality and morbidity. Seizure is a paroxysmal alteration in neurologic function resulting from abnormal excessive neuronal electrical activity. Epilepsy is

a chronic condition characterized by recurrent seizures unprovoked by an acute systemic or neurologic insult. An epileptic seizure is a clinical manifestation of abnormal, excessive neuronal activity arising in the grey matter of the cerebral cortex [(1)].

The incidence of epilepsy is approximately 0.3 to 0.5% and prevalence of epilepsy estimated as 5 to 10 persons per 1000. It is age dependant and higher in children and elderly persons than in young adults [(2)]

There is limited data regarding acute seizure episodes from the developing countries. A study was conducted by Adhikari et al [(3)] to find the common etiology of seizure and classify seizure types in various age groups presenting to tertiary centre in western Nepal. Out of the total 551 patients admitted, 53.5% presented with fever, 57.5% were less than 5 years of age. Generalized tonic-clonic seizure (GTCS) was the most common seizure type. Abnormal brain images were in 45.9% patients.

The present cross-sectional study was designed to study the clinico-radiological profile of children presenting with seizure in a tertiary care hospital in Nepal.

MATERIAL AND METHODS

This was a prospective cross-sectional study conducted in a tertiary care hospital in western Nepal over a period of two years. Children presenting with seizures were included in the study. The children of either sex and aged 0-16 years were included in the study. The study was approved by the Ethical Committee of the Institute. The consent was taken from mother/father/guardian before including in the study.

Neuroimaging of all the children was done by computed tomography (CT) of head. Number of lesions were counted in CT scan of head and labeled as single or multiple. The findings were reported in the form GTCS, partial seizure and others. Complete blood count, Mantoux test, ESR, X-ray chest and gastric aspirate for AFB were done in all patients to rule out tubercular infection of brain which may have CT finding mimicking NCC.

All the data was recorded in a pre-designed proforma.

Statistical Analysis

The results are presented in frequencies and percentages. The Chi-square test was used to assess the associations between categorical/ dichotomous variables. The p-value<0.05 was considered significant. All the analysis was carried out on SPSS 16.0 version (Chicago, Inc., USA).

RESULTS

Out of the total 168 children with seizures, 138 (82.1%) had GTCS and 30 (17.3%) had partial seizures. GTCS was slightly higher among male children (82.7%) compared to females (81.2%). However, partial seizure was slightly lower among male children (17.3%) compared to females (18.8%). There was no significant (p>0.05) association between gender and type of seizures. GTCS was more common among the children of age 5-8 years and partial seizure was more common among the children of age 9-12 years with no significant (p>0.05) association. There was no significant (p>0.05) association between religion and type of seizures. GTCS was higher than partial seizure in whom Mantoux test was positive with insignificant (p>0.05) association. The positivity of gastric aspirate for AFB was low (Table-1).

The percentage of GTCS and partial seizures was 80% and 20% in vesicular stage respectively. However, the percentage of GTCS and partial seizures was 69.2% and 30.8% in calcified stage respectively. The percentage of GTCS was found to be higher in whom phenytoin drug was used than others. The percentage of partial seizures was found to be higher in whom sodium valproate drug was used than others. There was no significant (p>0.05) association of stage and anti-epileptic drug with type of seizures (Table-2).

The percentage of GTCS and partial seizures was 89.5% and 10.5% in who fever was present and this association was found to be statistically significant. None of the other symptoms were associated (p>0.05) with the type seizures (Table-3).

On CT scan, the percentage of GTCS and partial seizure was 86.3% and 13.7% respectively in whom NCC was found. However, there was no significant association between CT findings and type of seizures (Table-4).

Table-1: Association of baseline characteristics of children with type of seizures (GTCS and partial)

Characteristics	No. of children	GTCS		Partial		p-value[1]
		No.	%	No.	%	
No. of children	168	138	82.1	30	17.9	
Gender						
Male	104	86	82.7	18	17.3	0.81
Female	64	52	81.2	12	18.8	
Age in years						
0-4	45	37	82.2	8	17.8	0.95
5.8	44	37	84.1	7	15.9	
9-12	44	35	79.5	9	20.5	
13-16	35	29	82.9	6	17.1	
Religion						
Hindu	154	125	81.2	29	18.8	0.27
Muslim	14	13	92.9	1	7.1	
Mantoux test						
Positive	8	5	62.5	3	37.5	0.15
Negative	156	129	82.7	27	17.3	
Gastric aspirate for AFB						
Positive	3	1	33.3	2	66.7	0.03*
Negative	158	130	82.3	28	17.6	

[1]Chi-square test, *Significant

Table-2: Association of stages on CT scan and anti-epileptic drugs with type of seizures (GTCS and partial)

	No. of children	GTCS		Partial		p-value[1]
		No.	%	No.	%	
Stage on CT scan						
Vesicular	55	44	80.0	11	20.0	0.20
Calcified	13	9	69.2	4	30.8	
Colloidal	2	1	50.0	1	50.0	
Nodular	2	2	100.0	0	0.0	
Anti-epileptic drugs						
Phenytoin (P)	98	84	85.7	14	14.3	0.27
Sodium valproate (V)	55	41	74.5	14	25.4	
Both P and V	11	9	81.8	2	18.2	
More than above two	4	4	100.0	0	0.0	

[1]Chi-square test

Table-3: Clinical correlation with type of seizures

Clinical symptoms#	No. of children	GTCS		Partial		p-value[1]
		No.	%	No.	%	
Fever	67	60	89.5	7	10.5	0.04*
Vomiting	59	51	86.4	8	13.6	0.28
Headache	27	24	88.9	3	11.1	0.31
Meningeal irritation	7	6	85.7	1	14.3	0.80
Unconsciousness	93	78	83.9	15	16.1	0.51
Speech disorder	4	2	50.0	2	50.0	0.08
Pallor	6	6	100.0	0	0.0	0.24

#Multiple response, [1]Chi-square test

Table-4: Neuro imaging in GTCS and partial seizures

CT scan findings	No. of children	GTCS		Partial		p-value[1]
		No.	%	No.	%	
Normal	73	63	86.3	10	13.7	0.40
NCC	72	56	77.8	16	22.2	
Others	23	18	78.2	5	21.7	

[1]Chi-square test

DISCUSSION

In previous studies, age has been documented to have a relationship with the etiology and type of seizures. In this study, the percentage of GTCS was higher in all the age groups. Infection as an etiology is more common in children, whereas drug default and toxic-metabolic causes are common in adults, who present to with seizures [4-6].

Generalized tonic clonic seizure was the most common type of seizure noticed at initiation of this study, as has been the experience in other studies as well [4-6]. The partial seizure was in 17.9% children. Bhalla et al [7] reported partial seizure being 14%. However, it is possible that a focal onset may have not been noticed by the bystanders/relatives, therefore not documented.

Study by Adhikari et al [3] and others [8, 9] also showed majority of seizures as generalized one. In contrast, the majority of seizures in the study by Kaeranen et al [10] were focal in nature. This may be because of most of the patient in this study were patients with febrile seizure which predominantly present with generalized feature.

In the present study, GTCS was slightly higher among male children (82.7%) compared to females (81.2%). However, partial seizure was slightly lower among male children (17.3%) compared to females (18.8%). In a study, male to female ratio was 4:1. 57.5% were known cases of seizure disorders [7].

Fever, vomiting, headache, meningeal initiation, unconsciousness, speech disorders and pallor were the commonly associated co-morbidities found in this study population. This is in agreement with the study by Yun and Xuefeng[11]. Similar findings were also noted in a retrospective study, where up to 42% patients presenting with seizure had an underlying disease[12]. This is also comparable to the findings by Idro et al [13] who had 80% of their study population had seizure associated with fever. Whether co-morbidity had a direct adverse effect on seizure in this study population could not be ascertained as numbers of patients was small.

Both phenytoin and Sodium valproate were used together for termination and phenytoin was used. This finding is in agreement to the study by Bhalla et al [7].

The investigations such as neuroimaging, lumbar puncture and electroencephalography has always been a contentious issue [7,14]. In this study, all the children underwent for CT of head. And majority children had NCC.

CONCLUSION

The study showed that seizure is one of the major causes of hospital admissions in children, particularly in the children. Febrile seizure is the most common cause of seizure in children and majority of them have generalized form of seizure. Seizure control with single drug, seizure without recurrence and idiopathic seizure are favorable prognostic factors.

REFERENCES

1. Ravindernath, Singh V. Role of MRI in evaluation of seizures. IAIM, 2016; 3(12): 127-136.
2. Goodridge DMG, Shorvon SD. Epileptic seizures in a population of 6000 demography, diagnosis and classification and role of the hospital services. Br Med J, 1983; 287: 641-647.
3. Bhalla A, Das B, Som, Prabhakar S, and Parampreet Kharbanda S. Status epilepticus: Our experience in a tertiary

care centre in Northwestern India. J Emerg Trauma Shock. 2014; 7(1): 9-13.

4. Nair PP, Kalita J, Misra UK. Status epilepticus: Why, what, and how. J Postgrad Med. 2011;57:242–52.
5. Cherian A, Thomas SV. Status epilepticus. Ann Indian Acad Neurol. 2009;12:140–53.
6. Kalita J, Nair PP, Misra UK. A clinical, radiological and outcome study of status epilepticus from India. J Neurol. 2010;257:224–9.
7. Yun C, Xuefeng W. Association between seizures and diabetes mellitus: A comprehensive review of literature. Curr Diabetes Rev. 2013;9:350–4.
8. Tiamkao S, Suko P, Mayurasakorn N. Srinagarind Epilepsy Research Group. Outcome of status epilepticus in Srinagarind Hospital. J Med Assoc Thai. 2010;93:420–3.
9. Adhikari S, Sathian B, Koirala DP, Rao KS. Profile of children admitted with seizures in a tertiary care hospital of Western Nepal.BMCPediatr. 2013; 13:43.
10. Chen CY, Chang YJ, Wu HP: New-onset Seizures in Pediatric Emergency. PediatrNeonatol 2010, 51(2): 103–111.
11. Huang CC, Chang YC, Wang ST: Acute Symptomatic Seizure Disorders in Young Children-A Population Study in Southern Taiwan. Epilepsia 1998, 39(9): 960-64.
12. Keranen T, Sillanpaa, Riekkinen P. Distribution of seizure types in an epileptic population. Epilepsia. 1988; 29(1): 1-7.
13. Idro R, Gwer S, Kahindi M, Gatakaa H, Tony Kazungu T, Ndiritu M. The incidence, etiology and outcome of acute seizures in children admitted to rural Kenyan district hospital. BMC Pediatrics. 2008, 8:5.
14. Goldstein JL: Evaluating new onset of seizures in children. Pediatr Ann 2004, 33(6):368–74