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CLASSIFICATION OF EPILEPSIES AND EPILEPTIC SYNDROMES USING INTERNATIONAL LEAGUE AGAINST EPILEPSY 2010: A HOSPITAL BASED STUDY FROM RURAL POPULATION OF NORTH INDIA.

Neurology

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ABSTRACT

Objectives: To determine the distribution of various epilepsies and epileptic syndromes in the people with epilepsy (PWE) in view of limited published data from rural population of India.

Material and Methods: A cross sectional, hospital based study was conducted among 500 PWE. The diagnosis of epilepsy and epileptic syndromes was established under the guidelines of the International League Against Epilepsy 2010.

Results: Among 500 PWE 340 (68 %) were male. Mean age was 27.19±17.5 years. Age ranged from 8 months to 93 years. Structural –metabolic (53.2 %) etiology was the most common underlying causes followed by electroclinical syndrome in 26.4 % and 6.4% had a distinctive constellation. Central nervous system (CNS) infections were noted in 16.2%, epilepsy with generalized tonic- clonic seizures in 15% and pre-/perinatal insults in 12.2 % of PWE.

Conclusion: Overall the most frequent etiologies of epilepsy in present study were central nervous system (CNS) infections, epilepsy with generalized tonic- clonic seizures and pre-/perinatal insults. Genuine hard work must be done to prevent the occurrence of epilepsy with prevention and successful treatment of infections along with up gradation of the pre/ perinatal care.

KEYWORDS

Epilepsy; Etiology; Classification; Seizures.

INTRODUCTION

Epilepsy is a common chronic neurologic disorder. Worldwide, around 70 million individuals are supposed to be suffering from epilepsy and among them about 90% reside in developing nations [1]. It is estimated that there are more than 12 million people with epilepsy (PWE) in India; which contributes to nearly one-sixth of the global burden. There is a disparity in distribution of epilepsy among various demographic and economic groups with higher rates reported for the rural population, male gender, and low socioeconomic status. Neuroinfections, neurotrauma along with birth injuries have emerged as most important risk reasons for secondary epilepsy. The understanding of etiology of epilepsy from various human populaces is essential to give standard baseline data.

Uttar Pradesh which is one of the largest and underdeveloped states of India and provide accommodation of around 16.50% Indian populace, additional most population reside in rural and remote area with limited medical resources . Despite of all these disturbing realities, no such investigation has been directed so far especially from our rustic region. Given this etiological distribution, prevention strategies tailored to different age groups may be an efficient way for reducing the occurrence of seizures.

In the 2010 report from the International League Against Epilepsy Commission on Classification and Terminology, 2005-2009, a number of new terms and concepts were introduced for classifying epilepsy and epileptic syndrome. The present study was aimed to determine the distribution of various epilepsies and epileptic syndromes in PWE under the guidelines of the International League Against Epilepsy 2010.

MATERIAL AND METHODS

We conducted a Cross sectional, hospital based study, from June 2017 to January 2018. Our institute is located in a rural and remote area of Etawah district; with a catchment area of 2311 km.2 It caters to the population of approx.6.5 million people of surrounding 11 districts.

All the patients who experienced epilepsy, attending neurology department were recruited during the study phase after obtaining their informed consent and approval from the institutional ethical Committee.

Inclusion criteria: All the people with epilepsy attending the neurology department.

Exclusion criteria: Patients with isolated unprovoked seizure, acute symptomatic seizures, non epileptic events and patients with neonatal seizures.

The diagnosis of epilepsy and epileptic syndrome was established under the guidelines of the International League Against Epilepsy 2010 [2]. Epilepsy was defined as two unprovoked seizures occurring at least 24 h apart [3].

Total 887 patients having epileptic seizures and epilepsy were evaluated in our hospital during this period. 500 patients with epilepsy fulfilled the inclusion criteria.

The information collected included patient's age, gender, religion, education, employment, family history, birth history, perinatal insults and history of febrile seizures. For grouping syndromes age at onset was categories into infant (<1 year), child (1–12 years), adolescent (12–18 years), and adult (>18 years) and elderly above 60 years.

All the patients who fulfilled the inclusion criteria were subjected to routine EEG (electroencephalogram) and neuroimaging in the form of magnetic resonance imaging (MRI) / computerized tomography (CT) scan of the brain. Local or generalized paroxysms sharp waves, spike waves; sharp and slow waves, spike and slow waves were teemed as epileptiform discharges.

Patients having characteristic brain lesion in imaging and/or metabolic abnormality were classified under “epilepsies attributed to structural-metabolic cause”. For those whose epilepsy could not be classified into any of the electroclinical syndromes or distinctive constellations, their condition was classified according to as epilepsy with unknown cause. Statistical analysis: The collected data was encoded and entered in MS Excel and IBM SPSS Version 23. Results were represented in graphs and tables. Data were expressed as percentage, mean, median, and standard deviation.

RESULTS

Five hundred patients were included in the study; among them 340 (68 %) were male. Their age ranged from 8 months to 93 years. Mean age was 27.19±17.5 years. Total pediatric population (below 12 years) were 90 (18 %), adults were 380 (76 %) and elderly (> 60 years) were 30 (6%). Majority of the patients were on monotherapy 60%. The MRI of brain was carried out in 410 patients and was abnormal in 320. Only computerized tomography (CT) scan of the brain was done over 90 cases and was abnormal in 72 .The electroencephalography recorded

in 480 cases, showed epileptiform discharges in 312 cases.

The commonest seizure type was focal seizures in 307 cases (61.4%), including focal seizures evolving to bilateral convulsive seizures in 206 (41.2%), focal motor seizures with dyscognitive features in 93 (18.6%) and focal motor seizures in 8(1.6%). The second common seizure type was generalized seizures in 188(37.6%) in which generalized tonic–clonic seizures were in 158 (31.6 %) cases and generalized tonic seizures in 19 (3.8 %) cases. (Table 1).

Distribution of various epilepsies in ILAE 2010 is shown in Table 2. A electroclinical syndrome diagnosis could be made in 26.4% (132/500).The common electroclinical syndromes were epilepsy with generalized tonic clonic seizures alone in 75(15 %) ,juvenile myoclonic epilepsy in 31 (6.2%) and childhood absence epilepsy in 7(1.4 %) ,west syndrome in 6(1.2%) and progressive myoclonic epilepsy 5(1%). Distinctive constellations were comparatively infrequent and constituted only 6.4 % (32/500) cases. Mesial temporal lobe epilepsy with hippocampal sclerosiswas present in 6% (30) cases. 53.2% of the cases had underlying structural -metabolic causes. Among them important causes were intracranial infections 81 (16.2 %) (Post encephalitic sequale 25 + calcified lesions 56), pre-/perinatal insults 61 (12.2%), stroke 49 (9.8%) and trauma 43 (8.6%). The three different age groups had dissimilar epilepsy etiologies. The most important cause of epilepsy in pediatric patients was pre-/perinatal insults; among the adult group was epilepsy with generalized tonic clonic seizures alone .While stroke was the leading cause among elderly patients (Table 3).

Overall the most common causes of epilepsy in our setup were central nervous system (CNS) infection (16.2%), epilepsy with generalized tonic clonic seizures alone (15%) and pre-/perinatal insults (12.2%).

DISCUSSION

The occurrence of epilepsy in rustic and underserved areas is twice where health care facilities are already lacking implies the critical need to reinforce epilepsy benefits in these zones. However, there are shortage of literature on epidemiology and etiology of epilepsy from rural area of developing countries particularly from our locale.

The commonest seizure type was focal seizures in 61.4 % in our study. Most of the hospital-based studies from India have recorded a higher frequency for partial epilepsies: 57 and 80% [4,5,6]. This is in consistent with the findings from other developing countries [7.8.9].

Underlying structural - metabolic etiology was observed in most cases (53.2 %), followed by electroclinical syndrome (26.4%). Another hospital based study from India including all age groups also had likewise findings. Khoo et al in their study among children and another population based study had also reported similar findings [10, 11, 12].

In our cluster CNS infection most frequent causes of epilepsy followed by epilepsy with generalized tonic clonic seizures alone and pre-/perinatal insults. Amongst the CNS infection post encephalitic sequale and calcified lesions were the most frequent causes. Murthy et.al in their hospital-based study from south India, among 1,117 patients established CNS infections in 17.4% of cases and focal calcified lesion in 8 % of symptomatic localization-related epilepsies [6]. Likewise another Indian study, autopsied 100 cases of status epilepticus recognized neuro infections and stroke as critical etiological components [13]. Different examinations from India similarly revealed CNS infections and pre-/perinatal insults as most common cause of epilepsy [11, 14].

In spite of fundamental advances in prevention and control of communicable and infectious diseases in India, infections are still a most vital cause. Consequently, proper understanding of the causes and risk factors of epilepsy are essential for successful management of epilepsy in India.

Efforts should be made to prevent the occurrence of epilepsy with prevention and effective treatment of CNS infections as they are potentially avoidable causes. Improvement of the pre/ perinatal care by improving awareness and infrastructures seems to be highly effective. The present studies provide baseline data from rural population for future studies and may guide the development of strategies for managing epilepsy in developing countries.

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Conflict of Interest: None of the authors has any conflict of interest to disclose.

Ethical approval: The study is in accordance with the ethical standards of the institution.

Table 1: Distribution according to Type of Seizures

Type of seizures			
		n	%
Generalized seizures		188	37.6
	Tonic-clonic	158	31.6
	Absence	7	1.4
	Tonic	19	3.8
	Myoclonic	2	0.4
	Myoclonic atonic	2	0.4
Focal seizures		307	61.4
	Focal motor	8	1.6
	Focal motor with dyscognitive features	93	18.6
	Focal with Bilateral Convulsive seizures	206	41.2
Epileptic spasms		5	1

Table 2: Distribution of various epilepsies in ILAE 2010 classification

Electroclinical syndromes		132 n	26.4%
	West syndrome	6	1.2
	Early-onset childhood occipital epilepsy	1	0.2
	Epilepsy with myoclonic atonic seizures	3	0.6
	Childhood absence epilepsy	7	1.4
	Lennox-Gastaut syndrome	1	0.2
	LKS-CSWS	1	0.2
	Juvenile absence epilepsy	2	0.4
	Juvenile myoclonic epilepsy	31	6.2
	Epilepsy with generalized tonic clonic seizures alone	75	15
	Progressive myoclonic epilepsy	5	1
Distinctive constellations		32	6.4
	Mesial temporal lobe epilepsy with hippocampal sclerosis	30	6
	Rasmussen syndrome	1	.2
	Hemiconvulsion-hemiplegia epilepsy syndrome	1	.2
Structural-metabolic causes		266	53.2
	Malformations of cortical development	20	4

	Neurocutaneous syndromes	1	.2
	Bain Tumors	10	2
	Intracranial infections	81	16.2
	Trauma	43	8.6
	Angioma	1	.2
	Pre-/perinatal insults	61	12.2
	Stroke	49	9.8
Epilepsy of unknown causes		70	14

Table 3: The leading causes of epilepsy in each specific age group.

Age group (n, %)	The first	The second
<12 years 90 (18)	Pre-/perinatal insults	Epilepsy of unknown cause
12-60 years 380 (76)	Epilepsy with GTC alone	Epilepsy of unknown cause
>60 years 30 (6)	Stroke	Trauma

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