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Epilepsia Partialis Continua over last 14 years: Experience from a tertiary care center from south India

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Summary Epilepsia Partialis Continua (EPC), a subtype of status epilepticus has varied etiology and the outcome depends on the cause. The aim of this study was to analyze the demographic, semiology, etiology, radiological findings, therapeutic response and outcome of EPC.

This is a retrospective analysis of 76 patients (M:F: 46:30; mean age: 30.2 ± 23.4 years; median age: 26 years) evaluated at our center over last 14 years. Twenty-three subjects (30.3%) had epilepsy for a mean of 25.8 ± 52.3 months (range: 1—81 years; median: 14) before developing EPC and in half of them, seizures were controlled with anti-epileptic drugs (AEDs). Rest 53 (69.3%) manifested as de novo. The mean duration of EPC was 47.02 ± 188.2 days (range: 1 h to 48 months; median: 3 days). One patient of generalized convulsive SE (GCSE) evolved into EPC while five patients of EPC evolved into GCSE. CT scan of brain ($n - 76$) was abnormal in 53 (69.7%) while all the 11 MRI scans which were available were abnormal. EEG ($n - 21$) was abnormal in all but one, however it was non-specific in 7. The diagnoses were—idiopathic: 17, ischemic stroke: 15, meningo-encephalitis: 8, Rasmussen's encephalitis (RE): 7, granuloma: 6, diabetic-non-ketotic-hyperosmolar-coma (DNKHC): 6, CNS malignancies (primary/secondary): 4, birth injury: 4, cerebral venous thrombosis: 3, CNS tuberculosis: 2, and cerebritis, HIV-related, toxemia of pregnancy, and MERRF one each. Patients of >40 years ($n = 21$) had stroke (10), idiopathic (6), DNKHC (4) and metastasis (1) as common causes. Only 12 of them received single AED, while others required 2 or more AEDs to control the seizures. The outcome ($n = 72$) was—controlled: 43 (59.7%); uncontrolled: 26 (36.1%) (RE: 7, idiopathic: 5, birth injury: 4, encephalitis: 3, malignancy: 2, granuloma and MERRF: 1 each) and three patients succumbed (encephalitis: 2, idiopathic: 1). Causes of EPC are varied and it depends on age. Underlying cause determined the outcome and could be refractory in RE, idiopathic, and when associated with birth injury, malignancy and encephalitis. Treatment of underlying cause is essential in addition to AEDs.

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Introduction

Abnormalities close to the central sulcus may give rise to long duration focal motor seizures. This condition is called Epilepsia Partialis Continua (EPC). It has varied underlying etiologies, which determines the outcome of EPC (Cockerell et al., 1994, 1996). It may be rewarding as in diabetic-non-ketotic-hyperosmolar coma (DNKHC) where prompt correction of altered metabolic state helps or it could be frustrating in Rasmussen's encephalitis (RE), to both the patients and treating physician, where most forms of treatment fails (Dawson, 1947a,b). Reports of large series with clinical profile, underlying causes and therapeutic outcome of patients with EPC from the Indian subcontinent are lacking.

The aim of this study was to analyze the demographic, clinical manifestations, radiological findings, underlying causes and short-term outcome of EPC seen at a tertiary neurological center from south India over last 14 years.

Patients and methods

In this descriptive retrospective study, analysis of case records of patients with Epilepsia Partialis Continua (EPC) who were evaluated at National Institute of Mental Health and NeuroSciences (NIMHANS), Bangalore, India, a university teaching hospital and a major referral center. Patients seeking neurological services over last 14 years (1992—2005) with definite manifestation of EPC were included for the study. EPC was defined as spontaneous regular or irregular clonic twitching of cerebral cortical origin, sometimes aggravated by action or sensory stimuli, confined to one part of the body and continuing for hours, days, or weeks (Obeso et al., 1985; Shorvon, 1994). Seventy-six patients ($n = 76$) with EPC fulfilled the criteria. Detailed history, demographic and clinical profiles of all the patients were noted. The images and scalp EEG recordings were reviewed. Underlying etiology, modes of treatment and the outcome data of these subjects were analyzed. The cause of mortality in three patients was documented.

Results

There were 46 males and 30 females. Their mean age at presentation was 30.2 ± 23.4 years (range: 1—81 years) with median age of 26 years. The mean duration of EPC was 47.02 ± 188.2 days (median: 3 days, range: 1 h to 48 months). The mean duration of seizures in RE was 219.1 ± 497.3 (median: 18.5 days) while it was much shorter in illnesses due to other underlying causes (Table 1). Twenty-three patients (30.3%) with EPC at the time of evaluation, had history of recurrent seizures for a mean period of 25.8 ± 52.3 months (median: 14 months) before developing EPC. Rest of the 53 (69.3%) patients manifested as de novo EPC.

Right-sided EPC was more frequent (R: 42 versus L: 34). One patient of generalized convulsive SE (GCSE) evolved into EPC while five patients of EPC evolved into GCSE. Topographic distribution of EPC included—upper and lower extremities: 41; cranial muscles: 12; upper extremities alone: 20; lower extremities alone: 3. Forty-eight patients (63%) were conscious during EPC while remaining 28 had varying grades of unconsciousness. Other neurological deficits noted during or immediately following control of seizures were hemiparesis/monoparesis: 36 (right-19, left-17); mental retardation: 4; language dysfunction: 6; ataxia: 1; proximal weakness: 1.

CT scan of brain ($n - 76$) was abnormal in 53 patients (69.7%). While it was normal in 22 patients, non-specific findings were diffuse cerebral edema: 8; diffuse cerebral atrophy: 6. Specific abnormalities in the rest were useful in reaching the diagnosis. Interestingly, CT scan of one patient of DNKHC revealed non-enhancing hyperdensity of the left striatum.

All 11 MRI scans were abnormal and helped in arriving at diagnosis (Table 2). Interestingly, in one patient no abnormality was detected in routine MRI sequences like T1W, T2W, PD, FLAIR and contrast, but on diffusion weighted

Table 1 Details of patients with Epilepsia Partialis Continua

Diagnosis	*N* (%)	Mean age (years)	M:F	Duration of EPC days (median)	Poor outcome/death	Statistics (χ^2)[a]
Idiopathic	17 (22.4)	28.3 ± 20.8	10:7	5.8 ± 14.3 (1.0)	9 (52.9%)	NS
Ischemic stroke	15 (19.7)	54.9 ± 15.8	4:1	2.6 ± 1.3 (2.0)	1 (6.6%)	0.01
Rasmussen's encephalitis	7 (9.2)	7.7 ± 6.02	5:2	219.1 ± 497.3 (18.5)	7 (100%)	0.001
Meningoencephalitis	8 (10.5)	15.8 ± 12.8	5:3	2.6 ± 1.4 (3)	5[b] (62.5%)	NS
DNKHC	6 (7.9)	64.5 ± 11.4	1:1	2.3 ± 1.1 (2.1)	1 (16.6%)	NS
Granuloma	6 (7.9)	38.1 ± 27.2	1:1	4.1 ± 7.03 (1)	1 (16.6%)	NS
CNS birth injury	4 (5.3)	3.5 ± 2.5	1:1	8.7 ± 14.2 (1)	4 (100%)	NS
Cerebral venous thrombosis	3 (3.9)	25.0 ± 3.0	0:3	1.7 ± 1.1 (1)	Nil (0%)	NS
CNS malignancy	2 (2.6)	45.0 ± 8.5	1:1	1 ± 0.0 (1)	2 (100%)	NS
Hematological malignancy	2 (2.6)	5.0 ± 4.2	1:1	7.5 ± 9.2	1[c] (50%)	NS
CNS tuberculosis	2 (2.6)	30.5 ± 6.4	1:1	1.5 ± 0.7 (1.5)	Nil (0%)	NS
Cerebritis	1 (1.3)	18	1:0	1	Nil (0%)	NS
HIV-related	1 (1.3)	7	0:1	3	Nil (0%)	NS
Toxemia of pregnancy	1 (1.3)	28	0:1	1	Nil (0%)	NS
MERRF	1 (1.3)	8	0:1	7	1 (100%)	NS

Statistics refers to poor outcome/death.

[a] Fisher exact one-tailed test, $p < 0.05$: significant and each diagnosis was compared with the rest of the group.

[b] Death: 2/5.

[c] Death: 1/4.