SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
Thiruvananthapuram-695 011

PROJECT REPORT

NAME : Dr. RAGHUNATH .B

PROGRAMME : D. M. NEUROLOGY

MONTH & YEAR OF SUBMISSION : 1997, NOVEMBER

PROJECT REPORT

TITLE OF THE PROJECT: **PROGNOSIS OF EPILEPSY: A 10 YEAR FOLLOWUP STUDY FROM A TERTIARY REFERRAL CENTRE IN S. INDIA.**

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CERTIFICATE

I, Dr. RAGHUNATH.B hereby declare that I have actually, performed all the procedures listed / carried out the project, under report.

Signature .....

Place : TVM

Date : 10/11/97

Name in DR. RAGHUNATH.B
capital letters

Forwarded. He has [carried out] the minimum requirement of procedures / etc.

Signature
Head of the Department

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CONTENTS

PROGNOSIS OF EPILEPSY : A 10 YEAR FOLLOWUP STUDY FROM A TERTIARY REFERRAL CENTRE IN S. INDIA.

INTRODUCTION

Increasing evidence shows that the prognosis of epilepsy is fairly good regardless of treatment regimen. However the characteristics of patients refractory to AED treatment are still ill-defined because several different prognostic factors are implicated, including a recognised etiology of seizures, EEG findings and seizures frequency at presentation. Sample size, seizure patterns, length of follow-up, and analytical methods vary significantly in different studies. Moreover conditions and etiological factors in a developing country may be different from more well developed countries (where most of these studies are done) so that extrapolation of data may not be possible.

Remission in epilepsy is defined as period of freedom from seizure, expressed for a specific time such as 1,2,3 or 5 years[1]. Remission is one of the most important measures of outcome of epilepsy. Sir Willam Gowers, more than a century ago, noted that the spontaneous cure of the disease is an event too rare to be reasonably anticipated in any case. For many years thereafter this was the prevalent view. In 1968 Rodin in his classic text on progress of epilepsy, concluded that no more than a third of patients with complex and drug resistant epilepsy who sought care at specialised tertiary treatment centers achieved remission[2]. Modern epidemiological studies have shown through population based studies that prognosis is far better than these previous assessments[3]. [4]Of patients with epilepsy > 70% enter remission, and at least half of them will eventually be able to stop taking medications with out relapse. But 20-30% of patients will continue to have seizures, despite reasonable attempts to control seizures with available AEDS[2].

Sander has pointed out that in a truly chronic condition that never remits, cumulative incidence should approach prevalence with the difference attributable to differential morbidity rates[2]. Population based studies from Nigeria in largely untreated groups of patients found high remission rates even without AED therapy[5]. In a randomised trial comparing 2 AEDS in drug-naive patients in Kenya, the response to treatment was quite comparable to what is seen in more economically developed countries in patients with newly diagnosed epilepsy. Half of the patients in a Kenyan study had epilepsy of > 5 years duration and about a third had a history of >100 seizures. In the trial, patients with longer duration of epilepsy and those with a history of >100 seizures responded equally well to medication as did those with epilepsy of briefer duration and fewer seizures[6] . Other studies also agree with these observations[7,8,9,10,11]. But Reynolds and colleagues found that in patients with newly diagnosed (though not necessarily new on set) epilepsy, remission was more likely to occur in patients who had fewer seizures before initiating treatment and whose seizures disorders were of shorter duration[12]. Careful scrutiny of this study reveals that outcome was correlated only with the number of complex partial seizures before initiating AEDS.

PATTERNS OF REMISSION

The temporal course of seizures have a lot of bearing on the prognosis. Shorvon (1984) studied the temporal course of epilepsy and patterns of seizure remission in 2 different populations. The first group was unselected patients identified within the community with a median history of epilepsy of 17yrs and the second group was from a specialised clinic. Three patterns of remission were readily identified (a) burst pattern, which consisted of a period of seizure activity followed by a remission (atleast 2yrs) that continued to the time of survey (b) intermittent pattern which consisted of a period of seizure activity followed by a remission of atleast 2years, with a sub-sequent relapse (c) continuous pattern, in which no remission occured.

Approximately 65% had a burst pattern of seizures and readily entered long term remission. About one quarter had continuing epilepsy from onset; in the remaining 12% of patients, remission was followed by relapse which was often associated with discontinuation of medication[13].

Epilepsy is a collection of syndromes and conditions rather than an illness or a process and failure to appreciate this may be responsible for some of the misconceptions about prognosis. Acute symptomatic seizures and febrile seizures are often not considered as epilepsy though clear epileptic phenomena are present. Once the diagnosis of epilepsy is established a syndromic or conditional diagnosis is attempted. This is always not successful. In the National General Practice study of epilepsy which is a population based study of 594 cases of newly diagnosised epilepsy, only in 33.6% were in diagnostic ILAE categories and many rare syndromes were not represented. The remainder (66.4%) were in various non specific categories. Only 4% of localization related epilepsis could be clinically localised to a single ILAE -proposed site and of these best localised cases,14% had strongly discordant imaging or electro encephalographic findings[14].

In many cases a syndromic diagnosis can only be made retrospectively. Some syndromes may not yet have been defined.

With reference to out come, the epileptic syndromes and conditions are classified in 4 different prognostic groups[2].

1. Excellent prognosis 20-30% conditions include benign neonatal seizures, benign partial epilepsy (rolandic epilepsy, benign occipital epilepsy, benign frontal epilepsy) benign myoclonic epilepsy of infancy, and some of the epilepsies with seizures precipitated by specific modes of activation (symptomatic seizures, drug induced, febrile convulsions).

2. Good prognosis Epilepsies. In this group with good prognosis are benign and short lived and may comprise approximately 30-40% of all who develop epileptic attacks. Conditions include childhood absence epilepsy generalised tonic clonic seizures on awakening, non-specific FTC seizures in patients with no neurologic signs, and some of the localisation related epilepsies.

3. Uncertain prognosis: The group has a long term tendency to seizures. They comprise 10-20% of patients; they may achieve remission but tend to relapse if AED treatment is discontinued. Treatment with AEDs is usually a life time prospect. Conditions include JME and the bulk of localisation related epilepsies.

4. Bad prognosis: The prognosis for seizure control is guarded in this group, which may comprise 20% all persons who develop epileptic attackes. AEDS in this group are palliative rather than suppressive of seizures. Conditions include seizures associated with neurologic deficit present form birth (tuberous sclerosis,Sturge Weber syndrome, malformations, cerebral palsy) epilepsia partialis continua, progressive myoclonic epilepsies, West syndrome, LGS, localization related seizures associated with gross structural lesions, and some localization related cryptogenic epilepsies.

We surveyed the patients with epilepsy presenting to our institute in 1985 to look for factors which influence seizure outcome, remission rate, relapse rate and outcome after relapse.

MATERIAL AND METHODS

Starting from Jan.1, 1985 till December 31, 1985 all patients examined in the Neurology out patient presenting with seizures were included. Patients with pseudo seizures and non epileptic events were excluded. All patients were contacted by a letter to come for an interview.A second letter was dispatched to patients who failed to attend the first interview. The information of patients who failed to attend the clinic were from the case records.

For each patient included in the study information was collected on several variables of suspected prognostic significance. Such as age, sex, handedness, history of status epilepticus, seizure-frequency at presentation, seizure types (commission 1981)[15] etiologic factors, general examination, neurolgic signs, epileptic syndrome (commission 1989)[16] investigation results and treatment modalites. Etiologic factors were defined as presence of previous CNS insults or other factors, believed to be associated with an increased risk of convulsions (eg: cerebro vascular disorders, head trauma or meningitis).Information was also collected on EEG, neuroimaging, antiepileptic drugs and remission duration,drugs taken during remission and reason for relapse.Information was also collected on 2nd remission after seizure recurrence.

For purpose of analysis the epileptic syndromes were determined by historical analysis supplemented by investigation results when possible.Since this was a retrospective study investigators had no control over AED therapy. AEDS were prescribed according to physician's judgement and prevailing practices at that time.

Remission was defined variously as 1 year, 2-year or 3 year remission of seizures after onset of treatment in this hospital. The variables were analysed statistically using chi-square test, t-test and correlation co-efficient to find the variables with closest association with outcome.

RESULTS

The study population were patients who were registered in 1985 with epilepsy. The follow up was done in a period of 2yrs (1995-97). There were 527 patients listed as having epilepsy. During follow up 80 patients were found to have non-epileptic events only and so were excluded from the study. Of the 447 patients remaining no follow up details were available for 207 patients. Out of the 240 patients who had subsequently visited our clinic 37 were for 2-3 years, 17 for 3-4 years 15 for 4-5years, 12 for 5-6years,3 for 6-7 years 4 for 7-8 years,4 for 8-9 years 11 for 9-10 years 141 for more than 10 years.

Mean follow up for complete sample was 7.81yrs (2-12yrs)

The mean age of the study group was 22.85 (range 0-79yrs). There were 287 males and 160 females 437 patients were right handed and 10 were left handed. 26 patients (5.8%) had history of status epilepticus at presentation.

Age of Patients at Presentation (Table 1)

	follow up	No follow up	Total	Percentage
<10	50	40	90	(20%)
10-20	74	53	127	(28.48%)
20-30	48	57	105	(23.48%)
30-40	34	23	57	(12.75)
40-50	13	15	36	(8%)
50-60	13	12	25	(5.6%)
60-70	6	6	12	(2.7%)
70-80	2	1	3	(0.67%)

Etiolgical factors (Table 2)

Congenital malformations	:	0	(0)
Perinatal distress	:	44	(9.8)
Neonatal seizures	:	7	(1.6)
Febrile Seizures	:	76	(17.0)
Encephalitis	:	18	(4.0)
Meningitis	:	5	(1.1)
Other brain infections	:	4	(0.9)
Stroke	:	22	(4.9)
Family history of seizures	:	63	(14.1)
Brain tumor	:	17	(3.8)
History of acute provoked seizures	:	9	(2.0)

General Examination (Table 3)

Neurocutaneous markers	:	17
Nevus of face	:	1
Facial angiofibroma	:	1
Periungual fibroma	:	0
Hypomelanotic macules	:	4
Neurofibroma	:	2
Cafe au lait spots	:	9

Seizures types at presentation (Table 4)

	follow up	No follow up	Total
Generalised			
Absence	6	8	14 (3.13%)
GTCS	118	150	268 (60%)
MS	28	8	36 (8%)
Partial			
Simple	18	14	32 (7.2%)
Complex	79	66	145 (32.4%)
Sei.generalised	88	72	160 (35.79%)

Seizure frequency (Engel Score) at presentation (Table 5)

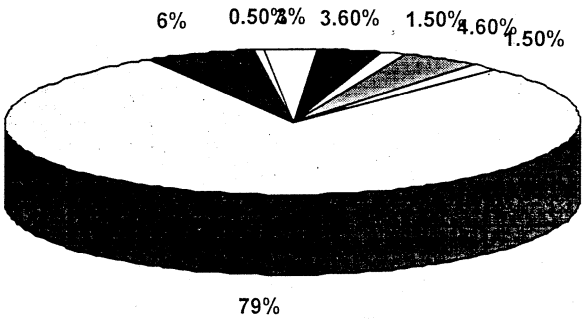
	No follow up	Follow up
>5	10	24
5-7	112	133
>7	85	83
Neurological Exam	No follow up	Follow up
Normal	150	190
Abnormal	57	50
Mental Retardation at Presentation		
Present	34	32
Absent	173	208

Epilepsy type at presentation (Table 6)

Epitype	(ILAE 1989)	No follow up (n=207)	Follow up (n=40)
1.21	Symptomatic Temporal lobe epilepsy	1	4
1.22	Symptomatic Frontal lobe epilepsy	6	2
1.23	Symptomatic Parietal lobe epilepsy	0	2
1.31	Cryptogenic Temporal lobe epilepsy	43	49
1.32	Cryptogenic Frontal lobe epilepsy	21	25
1.34	Cryptogenic Occipital lobe epilepsy	3	3
2.15	Juvenile Absence Epilepsy	4	1
2.16	Juvenile myoclonic epilepsy	4	1
2.18	Other idiopathic generalised epilepsies	90	10
2.21	West Syndrome	0	2
2.2	Lennox - Gastaut Syndrome	3	1
2.31	Other Symptomatic generalised epilepsies	20	12
2.32	Epilepsies due to specific neurologic disease	1	4
3.21	Without unequivocal focal or generalised features	0	1
4.11	Febrile convlusions	7	5
4.12	Isolated seizures or status epilepticus	3	2
4.13	Seizures due to an acute toxic or metabolic event	0	5

CT SCAN (Table 7)

Normal	153	(79%)
Infarct	12	(6%)
AVM	1	(0.5%)
Tumor	6	(3%)
Infection	7	(3.6%)
Calcification	3	(1.5%)
Cerebral Atrophy	9	(4.6%)
Hydrocephalus	3	(1.5%)



MRI (Table 8)

Normal	3
Tumor	1
Atrophy	1
MTS	1

Mortality at last follow up 7

Terminal Remission (Table 9)

Remission	1 year terminal remission	:	148
	2 year terminal remission	:	126
	3 year terminal remission	:	110
	5 year terminal remission	:	79

Total No.of follow up	:	240
Remission (2yr)	:	135 (56.25%)
No remission	:	105 (43.75%)

Remission failure (Table 10)

No failures	:	103	(76%)
Relapse	;	32	(23.4%)
Non compliance	:	16	(11.8%)
Drug side effect	:	2	(1.5%)
Infections	:	1	(0.7%)
Sleep deprivation	:	6	(4.4%)
Drug withdrawal	:	7	(5.2%)
Remission after relapse	:	20	(62.5%)
Remission after 2nd relapse	:	9	

Correlation between Epilepsy type & Remission (Table 11)

Epi type		Remission	No Remission
1.2.1	Symptomatic Temporal lobe epilepsy	2	2
1.2.2	Symptomatic Frontal lobe epilepsy	1	1
1.2.3	Symptomatic Parietal lobe epilepsy	2	-
1.3.1	Cryptogenic Temporal lobe epilepsy	22	27
1.3.2	Cryptogenic Frontal lobe epilepsy	13	12

1.3.4	Cryptogenic Occipital lobe epilepsy	2	1
2.1.5	Juvenile Absence Epilepsy	-	1
2.1.6	Juvenile myoclonic epilepsy	7	6
2.1.8	Other idiopathic generalised epilepsies	71	38
2.2.1	West Syndrome	-	2
2.2.2	Lennox - Gastaut Syndrome	-	1
2.3.1	Other Symptomatic generalised epilepsies	4	8
2.3.2	Epilepsies due to specific neurological disease	-	1
3.2.1	Without unequivocal focal or generalised features	1	1
4.1.1	Febrile convulsions	4	1
4.1.2	Isolated seizures or status epilepicus	2	2
4.1.3	Seizures due to an acute toxic	4	1

Chi Square	Value	DF	Significance
Pearson	26.03203	17	.07388

Correlation between Initial EEG and Remission (Table 12)

EEG	Yes	No.	Significance
Normal	72(69.2)	32 (30.8)	
Abnormal	43	51	
	(45.7)	(54.3)	00137

Correlation between Initial CT Scan findings and Remission (Table 13)

	Remission	Significance
CT	Yes	No.
Normal	60	27
Abnormal	15	10
		0. 54932

At last follow up visit, 62 patients (25.8%) were receiving mono therapy, and 133 patients were receiving poly therapy 45 patients who were in remission had discontinued AEDS.

Overall 148 (61.66%) patients achieved 1 year remission 126(52.5%) patients 2 year remission and 110 achieved 3 year remission and 79 (32.81%) patients had achieved 5yr remission. 20 (62.5%) patients had remission after a relapse and 9 (45%) patients continued to be in remission and 4 had the withdrawn medications.

Analysis of etiological factors showed that those affecting the chance of achieving a 2 year remission included the presence of 2 or more etiological factors. Patients presenting with a higher seizure frequency and having an abnormal EEG also had less chance of achieving remission. None of the other factors mattered, including 1st AED treatment and epileptic syndrome (even after proper stratification into individual syndromic pattern)

Correlation between Etiological factors and Remission

No Etiological factors	80 (56.3)	62 (43.7)	142
1 Etiological factor	40 (56.3)	31 (43.7)	71
> 2 Etiological factors	15 (55.6)	12 (44.4)	27
	135	105	240

Chi Square test	**Significance**
Pearson	.005596

Correlation between seizure frequency at presentation and at last follow up

Correlations	SFQ BEF	SFQNOW
SFQ-BEF	1.000	0.4446
SFQ.NOW	.4446	1.000

t-tests for independent samples of Remission Vs. seizure frequency

SFQBEF	No.of Cases	Mean	SD	SE of mean	Significance
Remission	135	5.3106	1.559	0.136	0.000
No Remission	105	6,8857	1.589	0.155	0.000

DISCUSSION

Age distribution seen in our study is similar to that seen in hospital based studies with >50% study population below 20yrs of age[17]. The mean age of the cohort was 22.5.

Two-thirds of the seizure types belonged to either partial or generalised (categories 1.3 and 2.1 of ILAE) which was similar to hospital based studies. The differences between the study population and the cohort of NGPSE which is population based is shown in the table.

		SCTIMST	NGPSE
1.	Localization-related epilepsies	0	252 (31)
1.1	Idiopathic (with age-related onset)		
	Benign childhood epilepsy with centrotemporal spikes		7 (0.9)
	Childhood epilepsy with occipital paroxysms		0 (0)
	Primary reading epilepsy		0 (0)
1.2	Symptomatic		96 (11.8)
	Chronic progressive epilepsia partialis continua of childhood		0 (0)
	Syndromes characterized by seizures with specific modes of precipitation		0 (0)
	Temporal,frontal,parietal, and occipital lobe epilepsies	13 (3%)	96 (11.8)
1.3	Crytogenic		
	Temporal,frontal,parietal, and occipital lobe epilepsies	144(32%)	146 (17.9)
2	Generalised epilepsies and syndromes	220(49%)	66 (8.1)
2.1	Idiopathic (with age-related onset)		55 (6.8)
	Benign myoclonic epilepsy in infancy		0 (0)
	Childhood absence epilepsy/juvenile absence epilepsy	5 (1.1%)	13 (1.6)
	Juvenile myoclonic epilepsy (impulsive petil mal)	17	9 (1.1)
	Epilepsy with generalised seizures on awakening		0 (0)
	Syndromes characterized by seizures with specific modes of participation		0 (0)
	Other idiopathic generalized epilepsies	198	33 (4.1)

2.2	Cryptogenic or symptomatic (in order of age)		0 (0)
	West syndrome (infantile spasms)	6 (1.3)	0 (0)
	Lennox-Gastaut syndrome	2 (0.4)	0 (0)
	Epilepsy with myoclonic seizures	4 (0.9)	0 (0)
2.3	Symptomatic	37 (8.2)	11 (1.4)
2.3.1	Nonspecific etiology		0 (0)
	Early myoclonic encephalopathy		0 (0)
	Early infantile epileptic encephalopathy with suppression burst		0 (0)
	Other symptomatic generalized epilepsies		0 (0)
2.3.2.	Epilepsies due to specific neurologic diseases	5 (1.1)	2 (0.2)
3	Epilepsies undetermined whether focal or generalized	0 (0)	190 (23.3)
3.1	With both generalized and focal seizures		0 (0)
	Severe myoclonic epilepsy in infancy		0 (0)
	Epilepsy with continuous spike waves during slow wave sleep		0 (0)
	Acquired epileptic aphasia (Landau-Kleftner syndrome)		0 (0)
	other undetermined epilepsies		0 (0)
3.2	Without unequivocal focal or generalized features	1 (0.2)	190 (23.3)
4	Special syndromes	27 (6)	306 (37.6)
4.1	Situation related epilepsies		
	Febrile convulsions	12 (27)	220 (27.0)
	Isolated seizures or status epilepticus	5 (1.1)	59 (7.2)
	Seizures due to an acute toxic or metabolic event	5 (1.1)	27 (3.3)

Our data differed from previous reports of newly diagnosed patients referred for neurologic or pediatric consultation and those of community studies. Many patients with epilepsy tend to achieve prolonged periods of complete seizure control during the follow up[18,19,20]. Then, within each epileptic category, the number of cases achieving seizure control tends to increase overtime, mostly during the 1st 3yrs after start of treatment. Possible explaniation for this discrepancy include selection bias, as only the most refractory of seizure syndromes are referred to a referral hospital. In our study, patients were included when they

were referred for expert opinion for refactory seizures. Follow up policy of that time in this hospital had discouraged further follow up if it was not considered necessary. Since only patients presenting to the clinic were studied, many syndromes which are easy to control are probably underrepresented. These may include many of the epileptic syndromes under the category of good prognosis & excellent prognosis (Sanders 1993).

Compared to the British National General Practice Study of Epilepsy (NGPSE) which had more than 90% 1 year remission and by 9 years 86% had achieved a 3 year remission[1], the 3 year remission in his study is only 45-83% which is disappointing . This may also be due to underrepresentation of both single seizures and provoked (acute symptomatic) seizures which constituted 9.9% and 4.5% respectively in the NGPSE[14]. In our study the single seizure provoked seizures (in patients who were on follow up) were 0.8% and 2.1% respectively. The mortality rate in our study was low compared to that in the NGPSE. It is interesting to note that most of their deaths occured in the 1st year of follow up which may explain the low mortality rate in our chohort given the selection bias.

Effect of etiology

HauserWA (1975) divided epilepsy into 4 principal categories: idiopathic epilepsy in which an obvious cause is not apparent, remote symptomatic epilepsy in which a long stand structural cause is immediately obvious, acute symptomatic epilepsy which is due to an immediate provoking insult and epilepsy in children who are neurologically abnormal at birth due to peri or antenatal brain damage[4]. There are problems with this classification. It is dependent on the sophistication of the investigations, and the degree to which they were employed, and the idiopathic group will probably include patients with suitable undetected cerebral structrual lesions such as MTS and neuronal migration disorders. The ILAEclassification is more sophisticated and it may not always be possible to apply ILAE classification retro-

spectively. Where possible the patients have been interviewed and relevant investigations done to reclassify the epileptic syndrome.

On analysis no significant difference in outcome could be discerned between various epileptic syndromes. There could be many explanations for this. Most likely is that each epileptic syndrome is not homogenous and many different etiologies and syndromes exist in each category, each with its own good or bad prognosis so that as a group they have similar prognosis. Moreover epileptic syndromes with excellent prognosis are not well represented in this study as compared to other population based studies. The introduction of new techniques such as more widespread use of high resolution MRI and identification of various genotypes of the primary generalised syndromes will generally shrink the nuembers of patients with cryptogenic epilepsy.

Effect of Seizure type

Previous studies have shown that the prognosis for patients with partial seizures is worse than that for generalised seizures, especially because partial seizures are often symptomatic[18,19,20]. In our study also, partial seizure had a worse prognosis than generalised seizures, though this was not significant statistically.

No conclusions could also be drawn about less common seizure types. Absences, though generally said to have good prognosis was only a small portion of our study which may be due to a referral basis and no conclusions could be drawn.

Effect of seizure frequency and treatment

Though quite a few patients have had many years of seizures behind them at presentation, the seizure frequency at registration and seizure frequency at last follow up was com-

pared and a positive correlation was found ie., those who had high seizure frequency initially continued to have a high seizure frequency at last follow up. AED treatment had only a modest modifying influence on seizure frequency at last follow up,on those not in remission.

A majority of our patients were on polytherapy. This could have been due to lack of willingness on the part of treating physicians to try high doses of a particular AED in the absence of a facility to determine serum AED levels. Various studies have shown marked reduction in seizure frequency with adequate trials of AED monotherapy.

A negative correlation was found between presence of etiological factors and remission and more the number of etiological factors present more the negative correlation. This was expected as most eiologic factors represented CNS insults and tendency towards epiplepsy.

Effect of EEG : Abnormal patterns at presentation was also significantly correlated with seizure outcome. A normal EEG was correlated with a better outcome. This is in contradiction to some of the previous studies. This is probably due to the inter rater variability and difference in quality and intensity of investigation.

Medical Research council antiepileptic drug withdrawal study group devised a prognostic index to obtain estimates of the probabilites of seizures recurring within one and two years of starting slow withdrawal of AEDS, or continuing treatment[22]. Not all variables were examined in this study, but of the variables examined abnormal EEG and presence of multiple etiological factors and a high seizure frequency had negative correlation with outcome

David Chadwick et al (1996) studied seizure recurrence in controlled epilepsy and in his cohort of patients, by 1 year 90% of patients had achieved a 6 moths remission; by 2yrs,85% of patients had achieved a 1 year remission and by 3 years, 63% of patients will have achieved 2 year remission. In our of study 20 patients (62.5%) attained a 2 year remission after a further seizure[23]. But only 9 out of these 20 patients (45%) continued in remis-

sion, the rest having had seizure recurrence. So the prognosis of this group of patients is still good provided AEDS are reinstituted at once as the majority of patients had a second relapse because they were non-complaint..

Future research must focus on the subgroup of patients refractory to AED treatment. Prognostic factors must be identified to ascertain this subset of patients and better to serve a basis of developing new strategies for evaluation of AEDS and for surgical treatment.

REFERENCES

1. Cockerell OC, Johnson AJ, Goodridge DMG, Sander JWAS, Shorvon SD. The remission of epilepsy: results from the National General Practice study of Epilepsy Lancet 1995; 346: 140-4.

2. Sander JWAS, Some Aspects of prognosis in the epilepsies : a review. Epilepsia 1993; 34: 1007-16.

3. Annegers JF, Hauser WA, Elveback L R, Remission of seizures and relapse in patients with Epilepsy Epilepsia 1979; 20: 729-37.

4. Hauser WA, Kurland LT. The epidemology of epilepsy in Rochester, Minnesota 1935 through 1967 Epilepsia 1975; 16: 1-66.

5. Osuntoken BO, Adeuja AOG, Nottidge VA et al, Prevalence of the epilepsies in Nigerian Africans: a community based study. Epilepsia 1987; 28: 272-9.

6. Feksi AT, Kaamugisha J, Eatiti S, Sander JWAS, Shorvan SD, Comprehensive primary health care anti epileptic drug treatment in rural and semi urban Kenya. Lancet 1991; 337: 406-7.

7. Callaghan N, O Callaghan M, Duggan B, Feely M, Carbamazepine as a single drug in the treatment of epilepsy. J. Neural Neuro surg Psychiatry 1987;41: 907-12.

8. Callaghan N, Kenny R, O Neilla B et al. A prospective study between carbamazepine, phenytoin and sodium valproate as monotherapy in previously untreated and recently diagnosed patients with epilepsy. J Nuerol Neurosurg Phychiatry 1985; 48: 639-44.

9. Shorvon SD, Chandwick DW, Glbraith A, Reynolds EH, One drug for Epilepsy Br.Med J. 1978; 1: 474-6.

10. Elwas RDC, Johnson AL, Shorvon SD, Reynolds EH. The prognosis of seizure control in newly diagnosed epilepsy N. Engl J Med. 1984; 311: 944-7.

11. Anne E Watts. The Natural history of untreated Epilepsy in Rural Community in Africa. Epilepsia 33(3) 464-468, 1992.

12. Reynolds EH, Early treatment of Prognosis of epilepsy. Epilepsia 1987; 28: 97-106.

13. Shorvon SD, The temporal aspects of prognosis in epilepsy. J Neurosurg Psychiatry 1984; 47: 1157-65.

14. Manford M, Hart YM, Sander JWAS, Shorvon SD. The National General Practise study of Epilepsy. The syndromic classification of the International League against epilepsy applied to Epilepsy in a general population Arch Neurol 1992; 49:801-8.

15. Commission on classification and Terminology of the International League against Epilepsy. Proposal for revised clinical and electroencephalographic classification of epileptic seizures Epilepsia 1981; 22: 489-501.

16. Commission on classification and Terminology of the International League against Epilepsy Proposal for revised classification of epilepsies and epileptic syndromes Epilepsia 1989; 30: 389-399.

17. Collaborative Group for the study of Epilepsy. Prognosis of Epilepsy in newly referred patients in a multi centre prospective study of the effects of monotherapay on the Long term course of Epilepsy. Epilepsia 1992; 33: 45-51.

18. Okuma T; Kumastiro A Natural history and prognosis of Epilepsy: a report multi-institutional study in Japan Epilepsia 1981; 22: 35-53.

19. Okuno T, HOM, Nakano S et al Carbamazepine therapy and long term prognosis in epilepsy in childhood Epilepsia 1989; 30: 57-61.

20. Sotijanov NG, Clinical evolution and prognosis of childhood epilepsies. Epilepsisa 1982; 23: 61-9.

21. Matson RH, Camer JA Collins JF et al comparsion of Carbamzepine, phenobarbital, phenytoin in partial and secondary generalised tonic-clonic seizures. N Engl J Med 1985; 313: 145-51.

22. Medical Research Council Anti Epileptic Drug Withdrawal Study Group. Prognostic index for recurrence of seizures after remission of epilepsy Br. Med.J. 1993; 306: 1374-78.

23. David Chadwick, Joan Taylor and Tony Johnson on behalf of the MRC epileptic Drug Withdrawal Group. Outcomes after seizures recurrence in people with well controlled Epilepsy and Factors that influence it Epilepsia 1996; 37: 1043-1050.

24. Oliver C. Cockerell, Anthony L Johnson, Josemir WAS Sander and Simon D. Shorvon. Prognosis of Epilepsy: A review and further analysis of the first nine years of the British National General Practice Study of Epilepsy, a prospective Population-based study, Epilepsia 1997;38(1): 31-46.

Natural History of Epilepsy : A 10 year Prospective Evaluation

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THIRUVANANTHAPURAM

1.	NAME	:			
2.	AGE AT REGISTRATION	:			
3.	SEX	:			M = 1; F = 2
4.	DISTRICT ADDRESS	:			
5.	H No.	:			
6.	DREG	:	Date of Registration	:	
7.	HAND	:	Handedness	:	R = 1, L = 2
8.	HIS SE	:	History of Status epilepticus	:	R = 1, N = 2

ETIOLOGICAL FACTORS

9.	ET - CON	Congenital CNS abnormalities Y = 1; N = 2
10.	ET - PN	Perinatal distress
11.	ET - NN	Neonatal seizures
12.	ET - FS	Febrile seizures
13.	ET - EC	Encephalitis
14.	ET - MT	Meningitis
15.	ET - OT	Other Brain Infections
16.	ET - ST	Stroke
17.	ET - FH	Family history of seizures
18.	ET - BT	Brain trauma
19.	ET - PS	History of Acute provked seizures
20.	ET - NMD	Neuronal migration disorder

GENERAL EXAMINATION

21.	GE - NCT	Neurocutaneous markers	Y = 1; N = 2
22.	GE - NEVF	Nevus of face	
23.	GE - AGF	Facial angiofibroma	
24.	GE - PUF	Periungual fibroma	
25.	GE - HMM	Hypomelanotic macules	
26.	GE - NF	Neurofibroma	
27.	GE - CAL	Cafe au lait spots	
28.	GE - NEVO	Epidermal nevi	
29.	GE - OTH	Others	

Any other remarkable features

30. NE-NEUROLOGICAL EXAMINATION (Normal = 1; Abnormal = 2)

Mental Retardation

Type of seizure

31. ABS Absence
32. GTCS Generalised tonic clonic seizures
33. CPS Complex Partial Seizures
34. SPS Simple Partial Seizures
35. MS Myoclonus
36. SEC-GEN Secondary generalised seizures
37. EPI - TYPE Type of Epileptic Syndrome
38. SFQ-BEF Seizure frequency score in the twelve months before registration

ENGEL SCORE		
Seizure free	off AED	0
Seizurefree	need for AED not known	1
Seizure free	Require AED to remain so	2
Non disabling simple (partial) seizures (aura) only	3	
Non disabling nocturnal seizures only		4
1-3 per year	5	
4-11 per year	6	
1-3 per moth	7	
1-6 per week	8	
1-3 per day	9	
4-10 per day	10	
> 10 per day	11	

INVESTIGATIONS

39.	EEGIDYS	1. Dysrrhythmia	Grade	1=1
40.	EEG1DLT	2. Delta	Grade	2=2
41.	EEG1ASY	3. Asymmetry	Grade	3=3
42.	EEG1SUP	4. Suppression		
43.	EEG1SLP	5. Sleep		
44.	EEG2DYS	Generalised	=	1
45.	EEG2DLT	Focal	=	2
46.	EEG2ASY	Frontal	=	1
47.	EEG2SUP	Temporal	=	2
48.	EEG2SLP	Central	=	3
49.	CT1	Parietal	=	4
50.	CT2	Occipital	=	5
51.	MRI1	Centrotemporal	=	6
		Multifocal	=	7

CT/MRI Coding

1. No Scan
2. Normal
3. Infarct
4. Haemorrhage
5. AVM
6. Tumor
7. Ring/disc lesion (infection)
8. Phakomatosis/Calcifications
9. Dysplasias
10. Arachnoid Cyst/Porencephalic cyst
11. Cerebral atrophy
12. Hydrocephalus
13. CVT
14. MTS/atrophy

ANTIEPILEPTIC MEDICATION

AEDs tried so far

1 = PB 2 = DPH
2 = CBZ 4 = VA
3 = MYS 5 = OTHERS (state name)

52. PAEDA
53. PAEDB
54. PAEDC
55. PAEDD

AED OR AED combination most useful

56. BSTAEDA
57. BSTAEDB

AED not tolerated

58. AEDNTA
59. AEDNTB

Current AED Medication (s) with dose

60. AEDA
61. AEDB
62. AEDC
63. AEDD
64. SDEFF Side effects of AED exhibited by the patient now

(a=Nil, b=Minor, C=Major) Y=1; N=2

65. SDEFFA
66. SDEFFB
67. SDEFFC

Followup 1 = Yes 2 = No

1. Exessive sedation
2. Poor School Performance
3. Ataxia
4. Nystagmus
5. Gingival hyperplasia
6. Hirsuitism, coarse facial features and acne
7. Lymphadenopathy
8. Peripheral neuropathy
9. Anemia
10. Cognitive decline
11. Others

(Minor - No change of drug) (Major - which necessitated change of drug)

68. REM REMISSIONS

Y = 1; N = 2

69.	REM1DUR	Duration	1. Non compliance
70.	REM1DRG	Drug	2. Drug Side effect
71.	REM1DGW	Drug withdrawn or not	3. other Medications
72.	REM1 FL	Reason for relapse	4. Infections - CNS
73.	REM2DUR	Duration	5. Infections - Other
74.	REM2DRG	Drug	6. Stroke
75.	REM2DGW	Drug withdrawn or not	7. Sleep depriation
76.	REM2FL	Reason for relapse	8. Drug withdrawal
			9. No relapse

77. SFQNOW Seizure frequency score in the last 12 months (Engel score)
78. SE10YR Status epilepticus in the last ten years (during follow up) Y/N Number
79. LA Date of last attack
80. LC Date of last contact
81. REV Type of last Review
82. ALIVE Alive/Dead Y = 1 / N = 2

(Date and year of death)