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## The Prognostic Factors of Seizure Recurrence in Newly Diagnosed Epilepsy

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**Background:** To evaluate the prognostic factors of seizure recurrence in newly diagnosed epilepsy at 1 year follow up. **Methods:** From the IUED (Inje University Epilepsy Database) we retrieved the epilepsy patients who had never before taken any antiepileptics (AED) and were followed up for 1 year. We retrospectively reviewed the medical records with special attention to : a) age of onset, b) history of antecedents, c) seizure frequency before starting AED, d) abnormal neurological examination, e) MRI findings, f) EEG findings, g) epileptic syndrome classification. We defined seizure recurrence as any seizure occurring during the 1 year evaluation follow up except during the AED titration period, having only an aura and being in poor compliance. We analyzed the prognostic factors that could reliably predict the seizure recurrence at 1 year follow up. **Results:** We found 104 patients (64 male, 40 female) who met the inclusion criteria. The mean age of onset was 23.7 years. Of 104 patients 19 had generalized epilepsy, 82 had partial epilepsy and 3 had unclassified epilepsy. Thirteen percent (13/104) developed seizure recurrence at the 1 year follow up. Significant univariate associations were noted between seizure recurrence and these factors: presence of antecedents [ odds ratio (OR) 4.8; 95% confidence interval (CI) 1.2-18.5 ], post-encephalitic epilepsy (OR 7.7; 95% CI 2.1 ~ 28), and abnormal neurological examination(OR 14.6; 95% CI 3.9-55). With multivariate logistic regression, the independent predictor of seizure recurrence was the abnormal neurological examination (OR 9.7; 95% CI 2.4 ~ 39.4). **Conclusions:** The chance of developing a seizure recurrence at the 1 year follow up was 13 percent and the prognostic factors were the presence of antecedents, post-encephalitic epilepsy and an abnormal neurological examination.  
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**Key Words :** Prognostic factor, Seizure recurrence, Antecedents, Post-encephalitic epilepsy,  
Abnormal neurological examination

	(remission)가	
0.5%	4%	10 ~ 20%
	1,2	3,4
가	80 ~ 90%	가
가	가	가
<hr/>		
Manuscript received February 1999, 24.		
Accepted in final form March 1999, 23		Collaborative study 5
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<b>Sung-Eun Kim, M.D.</b>	98%	1
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* 1997		가 3,6-9

5,10  
 가  
 (selection bias) 가  
 가  
 가  
 가  
 [ Inje  
 University Epilepsy Database(IUED)]  
 1 가 가 (consec-  
 utive) 104 (acute symptomatic epilepsy)  
 1 가  
 가 (compliance)가  
 (aura)  
 (titration)  
 1  
 MRI ; (hippocampal sclerosis)  
 Jackson MRI<sup>11</sup>  
 (visual analysis) . (≡) EEG ;  
 (epileptiform discharge)

(non-epileptiform discharge)<sup>12</sup> (스)  
 ; ILAE (International League  
 Against Epilepsy)<sup>13</sup> 가  
 24  
 MRI  
 (case-con-  
 trol study) Chi-square, Fisher's  
 Exact test, Student's test Logistic regression  
 Odds ratio  
 IUED 104  
 29 (6~74 )  
 64 , 40 25.6  
 (12~96 )  
 23.7 (5~72 ) 19  
 , 82 , 3  
 (undetermined epilepsy) . 19  
 18 (idiopathic  
 generalized epilepsy) 가 82  
 1 (idiopathic partial  
 epilepsy), 21 , 60  
 가 (Table 1).  
 MRI 65  
 39  
 10 가 29  
 [ (cerebromalacia) 20 ,  
 (neuronal migration disorder)가 2 ,  
 1 6 ]  
 (Table 2).  
 13% (13/104) 1  
 . 13

**Table 1.** Epileptic syndrome classification of the patients

Type of epilepsy	Number of patients
Generalized epilepsy	
Idiopathic epilepsy	18
Symptomatic epilepsy	1
Partial epilepsy	
Idiopathic epilepsy	1
T.L.E.	21
E.T.L.E.	60
Unclassified epilepsy	3
Total	104

T.L.E. : Temporal lobe epilepsy

E.T.L.E. : Extratemporal lobe epilepsy

91  
가 (Table 3).  
33±7.6 28.8  
±13.5 (p=0.31),  
7.6±6 7.9±  
7.7 (p=0.97) 가  
77% (10/13)  
55% (50/91)  
[OR=2.7, 95% confidence interval  
(CI) 0.7-10.6, p=0.39], 54% (7/13)  
MRI  
35% (32/91)  
(OR=2.1, 95% CI 0.65~6.8, p=0.21).  
92% (12/13), 80% (73/91)  
가 (OR=2.8, 95% CI 0.3~23.4, p=0.33)  
15% (2/13),  
27% (25/91) (OR=0.6, 95% CI 0.1~2.9, p=0.52)  
가  
77% (10/13), 42% (38/91)  
가  
(OR=4.8, 95% CI 1.2-18.5, P=0.02),  
62% (8/13),  
24% (22/91)  
(OR=7.7, 95% CI 2.1-28, P=0.002).  
14% (13/91)

**Table 2.** MRI findings of the patients

MRI findings	Number of patients
Normal finding	65
Abnormal findings	
Cerebromalacia	20
Hippocampal sclerosis	10
Neuronal migration disorder	2
Tumor	1
Others	6
Total	104

**Table 3.** Univariate comparison of seizure recurrence and controlled groups

Factors	Recurrence n=13, n(%)	Controlled n=91, n(%)	OR	95% CI	p-Value
Age of onset(years)	33.0±7.6	28.8±13.5	0.31		
Frequency of seizure	7.6±6.0	7.9±7.7	0.97		
Presence of antecedents*	10(77)	38(42)	4.8	1.2-18.5	0.02
History of encephalitis*	8(62)	22(24)	7.7	2.1-28.0	0.002
Abnormal neurologic examination*	9(69)	13(14)	14.6	3.9-55.0	0.0001
Abnormal EEG	10(77)	50(55)	2.7	0.7-10.6	0.15
Epileptiform discharges on EEG	9(69)	50(55)	1.9	0.4-8.2	0.39
Abnormal MRI	7(54)	32(35)	2.1	0.65-6.8	0.21
Partial epilepsy	12(92)	73(80)	2.8	0.3-23.4	0.33
Temporal lobe epilepsy	2(15)	25(27)	0.6	0.1-2.9	0.52

\*Statistically significant, p<0.05

가 (OR=14.6, 95% CI  
3.9~55, P=0.0001).  
가  
Multiple logistic regression  
(OR=9.72, 95%  
CI 2.4~39.4, P<0.01)  
(Table 4).  
78.8% (82/104)  
Collaborative study<sup>5</sup>  
Elwes<sup>10</sup> 29.3%, 21%  
(15 5 )  
Semah<sup>20</sup> 16  
62% 가  
8% 1 13% (13  
/104) Collaborative study<sup>5</sup> 38%  
Elwes<sup>10</sup> 60%  
1  
가 가

**Table 4.** Multivariate models for predictors of seizure recurrence

Predictors	OR	95% CI	p-Value
Presence of antecedents	1.86	0.39-9.92	>0.05
History of encephalitis	0.83	0.54-14.7	>0.05
Abnormal neurologic examination*	9.72	2.40-39.4	<0.01

\* Statistically significant, p<0.05

가

13% (13/104) 가

1 1

6,17, 20, 10,14, 9,15,17, 8,16, 6,14,15, 15,17-19,

1 1 10

가

6,14,15가

8,16, 15,17-19

가

1

Berg<sup>6</sup> Camfield<sup>17</sup> 가

(etiology)

Semah<sup>20</sup>

(symptomatic seizure)

가

Jackson<sup>11</sup> MRI

가 9.6%

(10/104) Van Paesschen<sup>21</sup>

9.5% (6/63) . Van Paes-

schen<sup>21</sup> 가

1

가 1

10% 20,22

가

## REFERENCES

1. Hauser WA, Annegers JF, Kurland LT. Incidence of epilepsy and unprovoked seizures in Rochester, Minnesota: 1935-1984. *Epilepsia* 1993;34:453-468.
2. Hauser WA, Annegers JF, Kurland LT. Prevalence of epilepsy in Rochester, Minnesota: 1940-1980. *Epilepsia* 1991;32:429-445.
3. Sillanpaa M. Remission of seizures and prediction of intractability in long term follow up. *Epilepsia* 1993;34:930-936.
4. National Institutes of Health Consensus Development Conference Statement. Surgery for epilepsy, March 19-21. *Epilepsia* 1990;31:806-812.
5. Collaborative Group for the Study of Epilepsy. Prognosis of epilepsy in newly referred patients: A multicenter prospective study of the effects of monotherapy on the long-term course of epilepsy. *Epilepsia* 1992;33:45-51.
6. Berg AT, Levy SR, Novotny EJ, Shinnar S. Predictors of intractable epilepsy in childhood: A case-control study. *Epilepsia* 1996;37:24-30.
7. Sofianov NG. Clinical evolution and prognosis of childhood epilepsies. *Epilepsia* 1982;23:61-69.
8. Brorson LO, Wranne L. Long-term prognosis of childhood epilepsy: survival and seizure prognosis. *Epilepsia* 1987;28:324-330.
9. Reynolds EH, Elwes RDC, Shorvon SD. Why does epilepsy become intractable? Prevention of chronic epilepsy. *Lancet* 1983;2:952-954.
10. Elwes RDC, Johnson AL, Shorvon SD, Reynolds EH. The prognosis for seizure control in newly diagnosed epilepsy. *N Engl J Med* 1984;311:944-947.
11. Jackson GD, Berkovic SF, Duncan Js, et al. Optimizing the diagnosis of hippocampal sclerosis using MR imaging. *AJNR Am J Neuroradiol* 1993;14:753-762.
12. Chartrian, G. E., Bergamini, L., Dondey, M., et al. A glossary of terms most commonly used by clinical electroencephalographers. *Electroencephalogr Clin Neurophysiol* 1974;37:538-548.
13. Commission on Classification and Terminology of the International League Against Epilepsy. Proposal for revised classification of epilepsies and epileptic Syndrome. *Epilepsia* 1989;30:389-399.
14. Annegers JF, Hauser WA, Elveback LR. Remission of seizures and relapse in patients with epilepsy. *Epilepsia* 1979;20:729-737.
15. Okuma T, Kumashiro H. Natural history and prognosis of epilepsy: report of a multi-institutional study in Japan.

- Epilepsia* 1981;22:35-53.
16. Emerson R, D'Souza BJ, Vining EP, Holden KR, Mellits ED, Freemann JM. Stopping medication in children with epilepsy: predictors of outcome. *N Engl J Med* 1981;304:1125-1129.
  17. Camfield C, Camfield P, Gordon K, Smith B, Dooley J. Outcomes of childhood epilepsy: A population-based study with a simple predictive scoring system for those treated with medication. *J Pediatr* 1993;122:861-868.
  18. Shafer S, Hauser WA, Annegers JF, Klass DW. EEG and other early predictors of epilepsy remission: a community study. *Epilepsia* 1988;29:590-600.
  19. Beghi E, Tognoni G (Collaborative group for the study of epilepsy). Prognosis of epilepsy in newly diagnosed referred patients: a multicenter prospective study. *Epilepsia* 1988;29:236-243.
  20. Semah F, Picot M.C, Adam C, Broglin D et al. Is the underlying cause of epilepsy a major prognostic factor for recurrence? *Neurology* 1998;51:1256-1262.
  21. Van Paesschen W, Duncan J.S., Stevens J.M., Connelly A. Etiology and early prognosis of newly diagnosed partial seizures in adults: A Quantitative hippocampal MRI study. *Neurology* 1997;49:753-757.
  22. Engel J Jr. Etiology as a risk factor for medically refractory epilepsy: A case for early surgical intervention. *Neurology* 1998;51:1243-1244.