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Review

Early predictors of outcome in newly diagnosed epilepsy

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ABSTRACT

Longitudinal studies of newly diagnosed epilepsy in children and adults have identified prognostic factors that allow early identification of patients whose seizures are likely to remain uncontrolled with antiepileptic medication. Results from outcome studies may be subject to bias, depending on the setting (community versus clinic), design (retrospective versus prospective) and characteristics of the patient cohort studied (age, types of epilepsy, specific comorbidities). Nevertheless, factors such as early response to medication, underlying aetiology, and number of seizures prior to initiation of treatment have consistently been found to be predictive of seizure outcomes. Other variables such as age, electroencephalographic findings and the presence or absence of psychiatric co-morbidities have been correlated with outcomes in some analyses. This review has examined studies of seizure outcomes in adults and children with newly diagnosed epilepsy identifying the risk factors that are associated with subsequent refractory epilepsy.

1. Introduction

Epilepsy, the tendency to have recurrent unprovoked seizures, is the most common serious neurological disorder. Its prevalence ranges from 0.5 to 1% of the population in developed countries, and is probably higher in developing countries.[1] This condition is, however, merely a symptom of a wide variety of neurological disorders, ranging from self-limiting and benign to devastating and fatal. Regardless of the aetiology, the tendency to suffer recurrent seizures exposes persons with epilepsy to a variety of physical, psychological and social morbidities.[2] Complete control of seizures can negate these consequences to a large extent.[3] The majority of patients diagnosed with epilepsy can expect to achieve good control of seizures with antiepileptic drug (AED) therapy,[4,5] but a substantial minority will continue to experience seizures in spite of a range of AEDs used in adequate doses either singly or in combination.[6] Some patients whose seizures prove difficult to treat could benefit from non-pharmacological strategies, especially epilepsy surgery, which still remains one of the most underutilised effective treatment modalities worldwide.[7,8] Early identification of patients whose seizures are likely to be pharmacoresistant would permit them to be offered referral for epilepsy surgery at the most appropriate juncture.[9]

2. Methodology

This short review will attempt to summarise data from relevant studies of outcomes in newly diagnosed epilepsy in paediatric and adult populations. These were identified from Pubmed using the search terms 'newly diagnosed epilepsy and outcomes' and 'newly diagnosed epilepsy and prognosis'. Search results were reviewed manually to identify relevant publications. All studies with a minimum of 100 patients, who were followed up for at least 2 years, were included in this review (see Tables 1 and 2).

Results from studies of prognosis of epilepsy are often conflicting. Some of the variability can be explained on the basis of differences in populations and methodologies. As the underlying cause of epilepsy can be widely varied, data from studies that 'lump' together all epilepsy types will be skewed in favour of those most frequent in the population. Studying well-defined epilepsy (electroclinical) syndromes separately can provide better prognostic information, but accurate classification is not always achievable even in patients attending specialist services. Studies based in specialist clinics can be expected to have better characterised patient groups, but may be biased towards the more severe epilepsies. Retrospective studies, especially those from specialist clinics, may not include patients with milder forms of epilepsy.

Studies that identify all persons with new onset epilepsy in a defined population over a fixed period of time and follow them up prospectively will have the least recruitment bias. However, identifying all cases can be challenging and the diagnosis may be

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Table 1
List of studies of outcomes in adult epilepsy. Studies from the same population have been grouped together. Studies marked with * (asterix) also inlcuded children.

Study	Recruitment period	Inclusion criteria	Exclusion criteria	Type of study	Setting	*n*	Epilepsy type	Follow up	Method of follow-up	*n* with outcome	Outcomes	Prognostic factors identified
Annegers et al.[13]	1935–74	>2 seizures not provoked by an acute cause followed for minimum of 5 years	Febrile and other provoked seizures	Retrospective	Community	618	Mixed	5–20 years	Chart review	457	5 year remission	Perinatal insult causing physical and intellectual handicap worst outcomes (46% remission)
			Single seizures								65% by 10 years	Post natal acquired epilepsy and idiopathi epilepsy 74% remission
											76% by 20 years	
Elwes et al.[15]	Not stated	Previously untreated epilepsy	None stated	Prospective	Clinic	106	Mixed	6–106 month	Clinical review	106	82% 2 year sf periods by 8 years of fu	Poor prognosis associated with
											35% immediate responders	Partial seizures
											28% SF throughout	High frequency of tonic-clonic seizures before treatment
												A neurologic, social, or psychiatric handicap
												A family history of epilepsy
Collaborative group[18]	1982	Previously untreated afebrile seizures	AEDs started >3 months before enrolment	Prospective	Clinic	280	Mixed	48 (median)	6 monthly review	228	1–year remission 62% at 1 year, 81% by 2	Remission less likely with multiple seizure types, higher number of seizures before treatment
			Polytherapy as initial treatment								Years, 92% by 3 years, and 98% by 5 years	Number of seizures in the first year of AED treatment correlated with risk of refractory epilepsy
			Prophylactic use of AEDs								3–year remission 92% 5 year remission 78%	
			Provoked seizures								22.1% not SF on monotherapy	
Cockerell et al.*[23]	1984–87	Definite epilepsy as judged by panel	Expert panel disagree with diagnosis of epilepsy	Prospective	Community	1091	Mixed	6 years	Contact primary care physician		5 year remission	Age and seizure type no effect on outcomes
Cockerell et al.*[24]						564 definite epilepsy		9 years			Idiopathic seizures 69%	Children lower remission rates than adults
MacDonald*[25]						228 - probable epilepsy		12 years			Remote symptomatic epilepsy 61%	Partial seizures worse than generalised ones
Stephen et al.[33]	1984–97	Newly diagnosed localisation related peilepsy	None stated	Retrospective	Clinic	550	Localisation reltated epilepsy	Median 5 (2–15)	Chart review	550	No difference between cryptogenic and symptomatic LRE	MTS worse than other causes of LRE