Psychiatric disorders in candidates for surgery for epilepsy

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Abstract

Objective—To provide a descriptive analysis of the prevalence and pattern of psychiatric morbidity among 300 consecutive epileptic patients refractive to treatment and admitted during a six year period for evaluation of their candidature for surgery.

Methods—Patients underwent detailed observation of their seizure and standardised psychiatric assessment. Patients were considered to be refractory to treatment if they continued to manifest seizures with an average frequency of at least once every month even with polytherapy using up to three different anti-convulsants for a period of at least two years. Of the 300 patients, 231 had a temporal lobe focus, 43 had a non-temporal lobe focus, and 26 patients had a generalised and multifocal seizure onset.

Results and conclusions—With the DSM-III-R criteria 142 (47.3%) patients emerged as psychiatric cases. A principal axis I diagnosis was made in 88 (29.3%), and an axis II diagnosis (personality disorder) in another 54 (18.0%) patients. The most common axis I diagnosis was anxiety disorders (10.7%). A schizophrenia-like psychosis was seen in 13 (4.3%). Most patients with personality disorders showed dependent and avoidant personality traits. There was a significantly higher psychotic subscore on the present state examination in the temporal than with the non-temporal group of patients. These findings were not significant when compared with patients with a generalised and multifocal seizure disorder. There were no significant findings between the different seizure focus groups on the neurotic subscores. The findings with regard to laterality of seizure focus and the neurotic or psychotic subscores were not significant.

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Surgical treatment for patients with refractory epilepsy has become common since the pioneering work of Horsley.¹ Resection of the seizure focus or corpus callosotomy to prevent interhemispheric spread of the seizure activity are the most common procedures. The largest number of epilepsy surgery operations have

been performed on patients with temporal lobe epilepsy.

The standard of psychiatric assessment in the units carrying out surgery for epilepsy varies widely. At the first Palm Desert workshop of centres carrying out surgery for epilepsy, it was concluded that psychiatric investigation of patients in epilepsy surgery programmes left much to be desired.² At the most recent Palm Desert workshop, there was general consensus that each patient should have a social and psychiatric care programme with set goals determined before surgery and the patient's progress and relationship to this plan should be evaluated after surgery.³

Psychiatric problems after temporal lobectomy have been reported in many series.⁴⁻¹² Considerable attention has also been focused on specific disorders such as interictal schizophrenia-like psychosis¹³⁻¹⁷ and depression.¹⁸⁻²² However, studies describing the pattern of psychiatric disorders among consecutive patients undergoing assessments in an epilepsy investigations unit or those assessed presurgically are lacking.¹⁰⁻¹¹ Even though Bladin¹² reports that extensive preoperative psychiatric data, including DSM-III diagnosis were available in his series of 115 temporal lobectomy patients, no such information is presented.

The epilepsy unit at University Hospital, London, Canada was formally opened in May, 1986 to investigate and treat patients with medically refractory seizure disorder and particularly to determine if resective surgery or corpus callosotomy would help. We first carried out a pilot study²³ to examine the prevalence of psychopathology in 71 consecutive patients with intractable epilepsy to determine if routine psychiatric assessments were warranted. Using the general health questionnaire (GHQ), a self rated 60 item measure of psychopathology,²⁴ 45% of patients were identified as psychiatric cases. This, in our opinion, was a psychiatric morbidity high enough to warrant the development of a comprehensive psychiatric consultation liaison service for the epilepsy unit. In addition to providing a clinical service, detailed research evaluation of the range of psychopathology in this sample is carried out.

This report provides a descriptive analysis of the prevalence and pattern of psychiatric morbidity among 300 consecutive patients admitted to the epilepsy investigation unit for evaluation of their surgical candidature. To the best of our knowledge, this is the largest series of its kind.

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Method

The sample for this study was drawn from consecutive adult (16 and over) patients refractory to treatment for epilepsy admitted to the epilepsy unit during a six year period (1989–94). Patients are considered to be refractory to treatment if they continue to manifest seizures with an average frequency of at least once every month, even with polytherapy using up to three different anticonvulsants for a period of at least two years. All patients have, therefore, been in treatment and investigated extensively before being sent to the epilepsy unit for assessment of their surgical candidature.²⁵ All patients underwent clinical observation of the seizure phenomena. The type of seizure activity was categorised by an epileptologist (WTB; RSM; SW) according to the classification of the International League Against Epilepsy.²⁶ All patients had standard EEG telemetry with scalp electrodes with continuous monitoring until sufficient seizures were recorded to delineate the focus. When scalp recordings failed to do this, then telemetry was continued with implanted subdural electrodes. This provided the epileptologist with as much certainty as possible of the type of epilepsy and of the seizure focus. In addition, all patients had a detailed clinical assessment by a psychiatrist (RM), who was not aware of the exact seizure focus in these patients at the time of assessment. All patients were informed of the purpose of assessment and the research component to data collection. The project was approved by the ethics committee of the University of Western Ontario. A written consent for participation was also obtained. The method used for evaluation was as follows:

SOCIODEMOGRAPHIC AND CLINICAL VARIABLES

The group comprised 300 consecutive patients admitted to the epilepsy investigation unit at University Hospital. The sociodemographic and clinical variables recorded were age, sex, marital, employment, and living status. The seizure variables included age of onset, duration, frequency, time of occurrence, and family history of seizures. Also noted were patient and family history of psychiatric disorder and previous psychiatric contact if any. A history of physical or sexual abuse and trouble with the law was also recorded.

PSYCHIATRIC INTERVIEW AND HISTORY

The Palm Desert workshop emphasised that psychiatric diagnosis is important and recommended using an international classification system as a standard practice in all units. According to a census of psychiatric availability, it was reported that although 73% of the replying units indicate use of a psychiatric assessment protocol, only 44% used DSM-III or ICD-9 for psychiatric diagnosis. All units were willing to use a standardised psychiatric assessment, if psychiatric expertise was available. The Europeans tended to prefer ICD-9 and the Americans DSM-III-R.³

All patients in this study had a detailed psy-

chiatric interview, which included a history of present and past complaints, personal, social, and family history, and mental state examination. This was carried out to arrive at a diagnosis based on the DSM-III-R criteria.²⁷ Information obtained from the structured clinical interview, present state examination²⁸ (see below) was also used to assist in the diagnostic process. The DSM-III-R provides descriptions of diagnostic categories of various mental disorders. A multi-axial evaluation permits each case to be assessed on several "axes", each of which refers to a different class of information. There are five axes in the DSM-III-R multiaxial classification. The first three axes constitute the official diagnostic assessment. Use of the DSM-III-R multiaxial system ensures that attention is given to certain types of disorders, aspects of the environment, and areas of functioning that might be overlooked if the focus were on assessing a single presenting problem. Axis I refers to the clinical syndromes and axis II refers to the personality disorders. The separation between axis I and axis II ensures that in the evaluation of adults, consideration is given to the possible presence of personality disorders that may be overlooked when attention is directed to the usually more florid axis I disorder. In many instances, there is a disorder on both axes. When a person receives more than one diagnosis, the principal diagnosis is the condition that was the main focus of attention or treatment at the time of evaluation. Axis III permits the clinician to indicate any current physical disorder or condition that is potentially relevant to the understanding or management of the case. All patients in this study had an axis III diagnosis of epilepsy.

PRESENT STATE EXAMINATION²⁸

The present state examination (PSE) consists of a structured clinical interview for ascertaining the presence of various psychiatric symptoms. It consists of 140 items, which systematically cover all the phenomena likely to be relevant when conducting a mental state examination. An important feature is that, although certain initial questions are compulsory, the onus is on the interviewer to carry out clinical cross-examination to establish the presence or absence of a symptom according to the criteria listed in the glossary for each symptom. There is a system of cut off points following obligatory questions, so that the interviewer can move on to another group of symptoms if he considers that there are no symptoms in a particular area. The items are grouped into sections to facilitate the conduct of the interview. Some items are rated on the basis of frequency of occurrence and some on the severity. Most items are rated on a combination of the two (1 = occasional or not severe, 2 = continuous or severe). The score sheet is completed during the interview, so that the rater is not left to trust his memory for such a comprehensive scale. The principal investigator (RM) has been trained in the use of the PSE and is a practised rater. As recommended, the time interval for the presence or absence of symptoms was the month preceding the assessment.

Table 1 Sociodemographic and clinical characteristics (n = 300)

	Seizure focus		
	Temporal (n = 231)	Non-temporal (n = 43)	Generalised (n = 26)
Age (mean (SD))	31.85 (9.60)	29.05 (8.86)	27.92 (8.04)
Sex:			
Men	116	24	13
Women	115	19	13
Marital status:			
Single	110	25	19
Married	96	14	5
Others	25	4	2
Age of onset (mean (SD))	12.88 (10.09)	12.33 (7.19)	12.73 (8.00)
Duration (mean (SD))	19.09 (10.32)	16.67 (9.11)	15.31 (8.91)
Number of seizures per month (mean (SD))	20.63 (36.86)	23.81 (43.50)	24.64 (41.52)

There were no statistically significant differences between the three groups.

The between rater reliability of the PSE has been studied extensively^{29,30} and studies have shown high levels of rater agreement for the instrument within a single centre, between centres, and between psychiatrists.^{31,32} The main practical limitation of the PSE is the difficulty in completing the full scale with patients who are disturbed, uncooperative, or uncommunicative. Also, minor psychopathology at assessment may be missed because of the high threshold for rating the PSE. However, this would ensure that there is a significant psychopathology in the patients who rate positively on the different items of the PSE. The routine statistical output (using the CATEGO program) provides symptoms and syndrome profiles, subscores and a total score, and a classification into categories which are highly concordant with an ICD clinical diagnosis. Symptoms are combined in the first stage of the CATEGO program to form 38 syndromes. Four subscores are derived from summing up the ratings on appropriate symptoms³² as follows: delusional and hallucinatory syndromes (DAH); behavioural, speech and other syndromes (BSO); specific neurotic syndromes (SNS); non-specific neurotic syndromes (NSN). Knights *et al*³³ combined DAH and BSO to derive a psychotic subscore and SNR and NSN to derive a neurotic subscore. The widespread use of the PSE in different countries helps bring uniformity and clarity into diagnosis and descriptive psychopathology.

Table 2 Epilepsy and psychopathology: DSM-III-R diagnosis (n = 300)

	Temporal (n = 231)	Non temporal (n = 43)	Generalised (n = 26)	Total sample (n = 300)
No psychiatric disorder	127 (55)	19 (44.2)	12 (46.2)	158 (52.7)
Psychiatric disorder	104 (45)	24 (55.9)	14 (53.8)	142 (47.3)
Axis II personality disorder	43 (18.6)	6 (14.0)	5 (19.2)	54 (18.0)
Axis I	61 (26.4)	18 (41.9)	9 (34.6)	88 (29.2)
Anxiety disorders	23 (10.0)	7 (16.3)	2 (7.7)	32 (10.7)
Schizophrenia	10 (4.3)	1 (2.3)	2 (7.7)	13 (4.3)
Mood disorders	7 (3.0)	2 (4.7)		9 (3.0)
Adjustment disorder	4 (1.7)	3 (7.0)		7 (2.3)
Impulse control disorder	2 (0.9)	4 (9.3)		6 (2.0)
Substance misuse	7 (3.0)		3 (11.5)	10 (3.3)
OMS with psychosis	4 (1.7)			4 (1.3)
OMS without psychosis	2 (0.9)	1 (2.3)		3 (1.0)
Conversion disorder	2 (0.9)		2 (7.7)	4 (1.3)

Values are numbers of patients (%). There were no statistically significant differences in the diagnostic type between patients with a temporal or non-temporal seizure focus or a generalised seizure disorder.

Results

GENERAL DEMOGRAPHICS (TABLE 1)

A total of 300 consecutive patients was assessed in the epilepsy unit during a period of six years. There were 147 women (49.0%), and 153 men (51.0%). The mean age was 31 (SD 9.44) years with a range of 16 to 61 years. Marital status was: single 154 (51.3%) and married 115 (38.3%). There were 159 (53.0%) living on their own and 141 (47.0%) with their parent/s. The mean age of onset of epilepsy was 12.79 (SD 9.54) and mean duration of epilepsy was 18.42 (SD 10.09) years. The mean frequency of seizures per month in the preceding year was 21.43 (SD 38.17). There was a family history of epilepsy in 89 (29.7%) and psychiatric illness in 117 (39.0%). Dexterity was right in 238 (79.3%), left in 43 (14.3%), and 16 (5.3%) were ambidextrous.

The focus of seizure onset was determined by telemetry using surface or subdural electrodes. Of the 300 patients 231 had a temporal lobe focus (116 left temporal lobe, 93 right temporal, and 22 bitemporal focus), 43 had a non-temporal focus, and in 26 patients there was no definite seizure focus. This last group consisted of patients with generalised, widespread, bilateral, or multifocal epileptiform abnormalities on EEG. The primary type of seizure in these patients was as follows: complex partial 146 (48.7%), simple/complex partial with secondary generalised 93 (31.1%), complex and simple partial 26 (8.7%), primary generalised 20 (6.7%), simple partial 12 (4.0%), and no seizure disorder detected one (0.3%).

PSYCHIATRIC DIAGNOSIS

Using the DSM-III-R criteria, 142 (47.3%) patients emerged as psychiatric cases. A principal diagnosis on axis I was made in 88 (29.3%) patients and an axis II diagnosis (personality disorder) in another 54 (18.0%). Table 2 shows the different diagnosis in the three groups of patients. The most common axis I diagnosis was anxiety disorders (10.7%). The word "neurosis" has been deleted from the official nomenclature, and the division among the various anxiety disorders has been made on the basis of valid and reliably recognisable clinical criteria. Anxiety disorders refer to pathological anxiety states, which are an inappropriate response to a given stimulus by virtue of either its intensity or its duration. This group of disorders includes panic disorder with or without agoraphobia, social phobia, generalised anxiety disorder, and obsessive-compulsive disorder.

The distribution of other psychiatric disorders was as follows: schizophrenia 13 (4.3%), mood disorders nine (3.0%), adjustment disorder seven (2.3%), organic brain syndrome seven (2.3%), impulse control disorder six (2.0%), substance misuse 10 (3.3%), and conversion disorder (pseudoseizures) four (1.3%).

An axis II diagnosis of personality disorders was made in 54 (18%) of our sample. Personality disorders refer to behaviours or traits that are characteristic of the persons'

Table 3 Epilepsy and psychopathology: present state examination CATEGO classes

	Total sample (n = 292)	Temporal lobe (n = 225)	Non-temporal (n = 42)	Generalised (n = 25)
No psychiatric disorder	157 (53.8)	117 (52.0)	24 (57.1)	16 (64.0)
Psychiatric disorder	135 (46.2)	108 (48.0)	18 (42.9)	9 (36.0)
Anxiety states	61 (20.9)	43 (19.1)	12 (28.6)	6 (24.0)
Neurotic depression	30 (10.3)	25 (11.1)	4 (9.5)	1 (4.0)
Schizophrenic psychoses	11 (3.7)	10 (4.4)		1 (4.0)
Obsessional neurosis	7 (2.3)	7 (3.1)		
Hysteria	1 (0.3)	1 (0.4)		
Uncertain psychosis	8 (2.7)	8 (3.6)		
Paranoid psychosis	8 (2.7)	7 (3.1)	1 (2.4)	
Depressive psychosis	3 (1.0)	3 (1.3)	1 (2.4)	
Manic psychoses	2 (0.7)	2 (0.9)		
Retarded depression	4 (1.3)	2 (0.9)		1 (4.0)

Values are numbers of patients (%). There were no statistically significant differences in the CATEGO classes between patients with a temporal or non-temporal seizure focus or a generalised seizure disorder.

recent and long term functioning and cause either significant impairment in social or occupational functioning, or subjective distress. Behaviours or traits limited to episodes of illness are not considered in making a diagnosis of personality disorder. Most of our cases did not meet criteria for a specific subtype of personality disorder and often showed dependent and avoidant personality traits.

Based on the CATEGO classes derived from the PSE, a total of 135 (46.2%) patients received a psychiatric diagnosis (table 3). The commonest psychiatric disorders based on this schedule were anxiety states 61 (20.9%) and neurotic depression 30 (10.3%). Other psychiatric disorders were as follows: schizophrenic psychosis 11 (3.7%), paranoid psychosis eight

(2.7%), uncertain psychosis eight (2.8%), obsessional neurosis seven (2.3%), depressive psychosis three (1.0%), retarded depression four (1.3%), manic psychosis two (0.7%), and hysteria one (0.3%). It should be noted that the PSE is not well suited to evaluate the category of personality disorders which cannot be evaluated on the basis of recording of symptomatology alone. It is possible that a number of patients who were diagnosed with a personality disorder on the basis of the DSM-III-R received a diagnosis of anxiety states or neurotic depression because of a degree of subjective distress at the time of evaluation. This would seem likely because of the discrepancy in the prevalence of anxiety disorders in 10.7% of patients based on the DSM-III-R and 20.9% based on the PSE.

PSYCHOPATHOLOGY AND SEIZURE FOCUS

The individual item ratings on the 140 item PSE were computed to arrive at 36 syndrome profiles. Table 4 shows the more commonly rated PSE syndromes based on the seizure focus. The highest ratings were on the syndromes of worrying, loss of interest/concentration, irritability, social unease, and ideas of reference. Given the relative infrequency of some of these ratings, the 38 syndromes were further categorised into the specific neurotic syndromes and non-specific neurotic syndromes leading to a neurotic subscore and a delusional and hallucinatory syndrome and behaviour, speech, and other syndromes leading to the psychotic subscore (table 5). There was a significant difference between the temporal and non-temporal groups on the delusional and hallucinatory syndrome ($P < 0.01$), behavioural speech and other syndromes ($P < 0.05$), and the psychotic subscore ($P < 0.01$). These findings were not significant when compared with patients with a generalised seizure focus. Also, the comparison between seizure focus and the neurotic subscores was not significant. Further statistical analysis was carried out to compare the ratings on the above syndromes and the laterality of seizure focus. These findings were also non-significant.

Discussion

There has generally been an agreement that psychopathology is overrepresented in epileptic populations. Surveys of unselected populations³⁴⁻³⁶ as well as specialised clinic samples^{23 37-40} disclose a considerable excess of psychopathology in patients with epilepsy. Candidates for surgery for epilepsy form a special group of such patients. However, the prevalence and pattern of psychiatric disturbance tend to vary across studies. Walker and Blumer¹¹ reported that 32% of their sample required admission to psychiatric hospital, whereas Jenkins and Larsen¹⁰ reported that only 8% of their sample were psychiatrically normal.

The present study is in keeping with the need for comprehensive psychiatric assessments for all candidates for surgery for

Table 4 Psychiatric symptoms and seizure focus

PSE syndromes	Temporal focus (n = 225)	Non-temporal focus (n = 42)	Generalised (n = 25)
Worrying	146 (69.9)	25 (59.5)	22 (88.0)
Loss of interest/concentration	99 (44.0)	19 (45.3)	10 (40.0)
Irritability	94 (41.8)	23 (54.8)	5 (20.0)
Social unease	89 (39.6)	10 (23.8)	8 (32.0)
Ideas of reference	78 (34.7)	10 (23.8)	5 (20.0)
Somatic symptoms of depression	70 (31.2)	12 (28.5)	5 (20.0)
Lack of energy	60 (26.7)	11 (26.2)	11 (44.0)
Tension	57 (25.3)	11 (26.2)	8 (32.0)
Special features of depression	55 (24.4)	8 (19.1)	6 (24.0)
Situational anxiety	44 (19.5)	11 (26.1)	6 (24.0)
General anxiety	22 (14.2)	7 (16.6)	5 (20.0)
Depressed mood	18 (8.0)	11 (26.2)	2 (8.0)
Obsessional syndrome	16 (7.1)	4 (9.5)	0
Non-specific psychosis	14 (6.2)	1 (2.4)	1 (4.0)
Organic impairment	12 (5.3)	1 (4.8)	2 (8.0)
Delusions of reference	9 (4.0)	0	1 (4.0)
Auditory hallucinations	6 (2.7)	0	1 (4.0)

Values (numbers of patients (%)) are for the most frequently occurring symptom clusters out of 38 syndromes based on the present state examination. There were no statistically significant differences based on the seizure focus.

Table 5 Psychiatric symptoms and seizure focus

	Temporal (n = 225)	Non-temporal (n = 42)	Generalised (n = 25)
Delusional and hallucinatory syndromes (DAH)	0.42 (1.78)	0.07 (0.46)	0.28 (1.40)
Behavioural, speech, and other syndromes (BSO)	0.39 (1.23)	0.12 (0.63)	0.32 (1.60)
Psychotic subscore	0.81 (2.60)	0.19 (1.09)	0.60 (3.00)
Specific neurotic syndromes (SNR)	1.55 (2.21)	1.62 (2.23)	1.40 (2.0)
Non-specific neurotic (NSN)	5.59 (4.69)	4.98 (4.4)	6.00 (7.73)
Neurotic subscore	7.14 (6.38)	6.60 (5.46)	7.40 (8.26)

Values are mean (SD). The 38 syndromes on the PSE were further categorised into the DAH and BSO (psychotic subscore) and the SNR and NSN (neurotic subscore). There were significant differences between the temporal and non-temporal seizure focus groups on psychotic ($P = 0.01$) scores, DAH ($P = 0.01$) and BSO ($P = 0.03$) but not on the neurotic scores. There were no significant findings based on the laterality of seizure focus.

epilepsy and is the largest series to date. As more centres across the world undertake surgery for epilepsy, it is important to have some idea of the kinds of psychiatric problems likely to be encountered during the assessment for surgical candidature. This cohort of candidates for epilepsy surgery was formed through a process of extensive outpatient investigation and careful selection of treatment refractory patients. It is representative of patients deemed suitable for consideration for epilepsy surgery and forms a subset of a larger group of patients with chronic treatment refractory epilepsy. Thus our findings cannot be generalised to epilepsy at large. Further, patients are more likely to be admitted if a focal onset of seizures is suspected during their outpatient evaluation and follow up. Also, they should be considered cooperative with assessment and monitoring. Patients are not denied admission because of a specific psychiatric disorder. Our sample is large ($n = 300$) and used standardised diagnostic criteria such as the PSE and the DSM-III-R. Further, the patients studied in this group had extensive documentation on their seizure variables and as much certainty as possible as to their seizure focus. The present investigation also provides a database for comparison with postoperative psychiatric morbidity.

In this study, nearly half of the patients (47.3%) had evidence of a psychiatric disorder. Axis I diagnosis was made in 88 (29.3%) and axis II disorder in 54 (18.0%). This is lower than in previous studies. In a recent study of patients with complex partial seizures,⁴¹ a lifetime prevalence of axis I diagnosis was found in 70% and axis II disorder in 18.3%, giving a total lifetime prevalence of 88.3%. Blumer *et al*¹⁸ studied 97 consecutive patients admitted to an epilepsy monitoring unit and found that 65% had a psychiatric morbidity. In a study of 100 consecutive temporal lobe epileptic patients,⁶ the prevalence of psychiatric disorders was 87%. The patients were categorised as normal ($n = 13$), neurotic ($n = 30$), psychopathic ($n = 48$), psychotic ($n = 16$) or of epileptic personality ($n = 5$). In 12 patients, two diagnoses were made. In the neurotic group, 17 patients were considered depressed and 22 patients had one or the other form of anxiety disorders. In the psychotic group, eight had schizophreniform psychosis as described by Hill⁴² and Pond.⁴³ This would correspond to the schizophrenia like psychosis of epilepsy.⁴⁴ Our PSE findings of anxiety states in 20.9% and neurotic depression in 10.3% of patients are comparable with those of Taylor.⁶ Based on the DSM-III-R classification, 16% of patients had a diagnosis of anxiety disorders, mood disorders, and adjustment disorders. A total of 13 (4.3%) patients presented with a schizophrenia like psychosis. Another four (1.3%) had an organic psychosis. Overall, 6.0% of patients with a temporal lobe focus and 7.7% of patients with a generalised seizure disorder had a psychotic illness at the time of assessment. The 5.6% overall prevalence of psychotic illness is comparable with many studies. In a recent review, Trimble⁴⁵

concluded that when the outliers are excluded, the prevalence of psychosis in epilepsy ranges from 2.4% to 8%.

Personality disorders were diagnosed in 54 (18%) of our patients. Most of these patients did not meet the criteria for a specific type of DSM-III-R axis II disorder, but there was significant personality dysfunction to justify this diagnosis. We did not see so-called "epileptic personality" with features of hypergraphia, hyperreligiosity, increased philosophical interest, and altered sexuality as reported in earlier studies.^{6,46,47} This impression is based on the clinical interview and utilisation of the DSM-III-R criteria for personality disorders. It was limited by the fact that the PSE is not suited for the investigation of personality disorders. Taylor⁶ considered his patients to be psychopathic (48%) if they had a character disorder as well as aggressive and rude behaviour. The term "epileptic personality" ($n = 5$) was used in extremes of religiosity or stickiness or arrogant personality. Four of these patients were also included in other categories. Taylor also used various adjectives for psychopathic disorders—for example, aggressive (27%), immature or inadequate (15%), paranoid (7%), antisocial (6%), cyclothymic (4%), schizoid (3%), and sexual deviations (2%). Most of these patients would not fit into a modern psychiatric diagnostic criteria. Most of our patients had personality traits of dependent and avoidant type.

The association between epilepsy and psychopathology has been discussed for many years, and over time there has generally been an agreement that psychopathology is overrepresented in epileptic populations.⁴⁸ Our study in a selected population of treatment refractory epileptic patients admitted for investigation of their surgical candidature also supports this hypothesis. However, the controversy as to whether or not psychiatric disturbance is related to the type of epilepsy continues to persist. We failed to confirm that patients with focal epilepsy, particularly deriving from the temporal lobes, show more psychopathology than those with a generalised seizure disorder or with a non-temporal seizure focus. Interestingly, when we looked at specific psychiatric symptomatology based on standardised rating criteria of the PSE, we found that patients with a temporal lobe seizure focus had significantly higher psychotic symptomatology than those with a non-temporal seizure focus. There was no significant difference on psychotic subscore between the temporal lobe group and patients with a generalised seizure disorder. This is probably due to the presence of one psychotic patient in the generalised seizure disorder group. Patients with temporal lobe seizure focus, however, did not rate significantly higher on the neurotic syndromes when compared with non-temporal lobe focus or a generalised seizure disorder (table 5). Several investigators^{38,39,49,56} found no difference in the incidence of various psychiatric disorders in different types of epilepsies. Others, however, have reported a very increased incidence of psychiatric disorders in

patients with temporal lobe epilepsy compared with those with other types of the illness.⁵⁷⁻⁶⁸

The role of the temporal lobe in the development of psychosis in epilepsy has been a matter of considerable disagreement in the medical literature. A classification system for psychosis in epilepsy should ideally consider psychopathology, duration, and course of psychosis, type of epilepsy, relation to seizure activity, drug treatment, EEG findings, and psychosocial factors.¹⁵ Variations in phenomenology and precipitation can also be seen between patients who experience recurrent psychotic episodes.⁶⁹⁻⁷⁰ The usefulness of both clinical application and research purposes of previously proposed syndromic classification systems⁷¹⁻⁷⁴ is therefore limited. Rather than looking at the type of psychotic disorder based on a diagnostic system, we looked at psychotic symptomatology presented by our patient population. It is widely accepted that psychoses are positively linked to temporal lobe epilepsy³⁷⁻⁴⁴ but this has not been confirmed unequivocally by controlled studies.⁷⁵ Several controlled studies have shown that psychotic disorders are no less frequent in generalised epilepsies than in temporal lobe epilepsies.³⁸⁻³⁹⁻⁶⁷⁻⁷⁶⁻⁸⁰ Our findings are similar. However, when we examined the presence of any psychotic symptoms based on PSE ratings, patients with a temporal lobe seizure focus had a significantly higher psychotic subscore than patients with non-temporal focus (table 5). There are other studies which show an increased risk for psychosis in temporal lobe epilepsy compared with generalised epilepsies.⁴⁰⁻⁶⁸⁻⁷⁹ Results from studies to date suggest that (a) psychoses are rare complications in a group of patients with epilepsy, (b) patients with epilepsy and psychosis are overrepresented in special centres, and (c) there is a link between more severe and more "Schneiderian" psychoses and temporal lobe epilepsy compared with generalised epilepsy. Our study would support this conclusion. The strongest risk factors for psychosis and epilepsy are long duration of epilepsy,⁶⁰ multiple seizure types,⁷²⁻⁷⁹⁻⁸¹⁻⁸⁵ and poor response to drug treatment.⁸¹⁻⁸⁵ All our patients were refractory to treatment. Further, the mean duration of epilepsy in patients with a psychotic disorder was 24.3 years compared with the mean duration of 18.4 years in the total sample.

Substantial evidence indicates that patients with epilepsy experience a higher rate of depressive symptoms²²⁻⁸⁶ than do non-epileptic patients with the same degree of disability.²⁰ These findings have been reported both in patients with primary generalised epilepsy and those with complex partial seizures of temporal lobe origin.⁷⁸⁻⁸⁷ In a recent study,⁸⁸ of 53 patients with medically intractable complex partial seizures, 33 (62%) had a history of interictal depressive disorders, 16 (30%) of whom met criteria for one or more major depressive episodes. Based on the DSM-III-R diagnosis, only nine (3%) of our patients had a diagnosis of a mood disorder and another seven (2.3%) patients had a diagnosis of an

adjustment disorder. On the basis of the PSE, 30 (10.3%) patients had a neurotic depression. Other diagnoses consisted of depressive psychosis three (1.0%), retarded depression four (1.3%), and manic psychosis two (0.7%), making a total of 39 (13%) for mood disorders. The prevalence of depression in our patients is much lower than those seen in other studies. One explanation may be that our findings are point prevalence of depression as opposed to lifetime prevalence. Further, it may be argued that on admission to an epilepsy monitoring unit, the entire focus is on the seizures and the patients may not mention complaints of an emotional nature. Depressive symptoms in evidence may therefore be viewed as reasonable reaction to a difficult chronic disorder. We would argue against this, as all patients were clinically evaluated in detail and were observed for several days by the nursing staff. On the other hand, our patients wait for about a year before admission to the unit and are unlikely to refuse admission because of emotional difficulties such as depression. Also, they may be more hopeful than at any other time because of the possibility of relief from their chronic disorder.

There was a high prevalence of epilepsy in family members (29.7%). Such a familial predisposition has been well documented in generalised epilepsy and even in focal epilepsy.⁸⁹ The potential impact of epilepsy on the family is difficult to gauge and likely to be variable. The prevalence of psychiatric disorders in the first degree relatives of our patient sample was also high (39%). In an epidemiological study, Rutter and colleagues⁹⁰ reported that one fifth of mothers of children with epilepsy had a history of nervous breakdown. Hoare⁹¹ reported an association between psychiatric disturbance in the child with chronic epilepsy and increased psychiatric morbidity in the mother. It was proposed that if a child continues to have epilepsy, it may adversely affect the psychological health of the mother. Bagley⁹² reported a similar finding of increased emotional distress in mothers of children presenting with more disturbed behaviour. Further, higher levels of anxiety and depression were reported in the main caretakers of patients with epilepsy⁹³ compared with those reported in general medical outpatients and within the general population. The group of patients in our sample are highly selected, with a long duration of epilepsy refractory to treatment. These patients and their immediate family members are a particularly vulnerable group.

The phenomenology experienced by the patients with a seizure disorder is comparable with those patients with a psychiatric disorder but without epilepsy. Esquirol's⁹⁴ view that all manner of mental reactions may accompany epilepsy remains true, despite the fact that we are looking at a selected group of patients for possible surgical intervention. Vasquez⁹⁵ considered that no specific mental state identified the patient with temporal lobe epilepsy. According to Fenton,⁷⁴ the interictal psychiatric disorders of epilepsy manifest the same range of mental state and behavioural phe-

nomena as the functional psychiatric syndromes in the absence of epilepsy. Himmellhoch⁹⁶ argued that epileptic patients present with atypical behavioural syndromes, which may not be comparable with the non-epilepsy associated psychiatric disorders. Whereas this may be true in a few patients with a severe neurological and psychiatric disorder, as evidenced in some of the older medical literature, there is not much evidence to generalise it for all psychiatric disturbances seen in epileptic patients. The present study was not specifically designed to test this hypothesis. However, an assessment of a selected group of candidates for surgery for epilepsy shows that a wide range of psychiatric morbidity is present.

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