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An audit of treated epilepsy in Glasgow

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An audit of patients receiving antiepileptic drug therapy for epilepsy was carried out in 25 general practices in Glasgow. Patients were identified from computerized records of repeat prescriptions for antiepileptic drugs. Overall, 1052 (0.72%) of 145,609 screened patients had treated epilepsy. Only 5% were children, while 19% were over 65 years. Twenty-nine per cent were diagnosed by a neurologist, and in 24% no record was available of who had made the diagnosis. Fifty per cent had tonic–clonic seizures only. Partial seizures occurred in 39%, absences in 4%, and myoclonic jerks in 3%. In only 39% of case records was current seizure control documented. Seventy-four per cent and 41% of patients had surface electroencephalography and computerized tomographic brain scanning, respectively. In more than 80% of patients the presence or absence of birth injury, febrile convulsions in childhood, and a family history of epilepsy were not mentioned. Seventy-six per cent of patients were receiving anticonvulsant monotherapy. The most commonly prescribed drugs were carbamazepine (43%), phenytoin (34%), sodium valproate (22%) and phenobarbitone (15%). Eighty-four per cent had attended a hospital clinic with their epilepsy, and 19% had been admitted to hospital with seizures or complications. A standard record form for the assessment and follow-up of epileptic patients in general practice would help in providing optimal management and in facilitating the setting up of a shared-care programme.

Key words: epilepsy; antiepileptic drugs; seizures; diagnosis; hospital admission.

INTRODUCTION

Epilepsy is the second most common neurological disorder affecting an estimated 50 million people world-wide[1]. The incidence ranges from 50–122 per 100 000 individuals[2]. It has a prevalence of 5–10 per 1000, with a life-time prevalence of around 5%. Over 300,000 people in the UK have active epilepsy and more than 1 million will have a history of one or more seizures at some time in their life. A recent report suggests that epilepsy in the UK costs in the region of £1930 million per annum[3].

Epilepsy brings the patient into contact with a number of medical and other agencies. However, despite this, there seem to be deficiencies in the overall level of care[4]. This may be due to the variable quality of these services, their fragmentary nature and their poor organization[5]. In addition, epilepsy is a condition that carries a unique burden for the patient and his or her family. For many there is the effect, imagined and actual, of stigma resulting in considerable physical, psychological and social problems.

There have been a number of audits of epilepsy in general practice, usually of small numbers of patients[5–13]. These studies, mainly of single practices, found that treatment was generally poor. There were deficiencies in care, particularly in the area of patient assessment and investigation. Seizure control was inadequate. There was inappropriate prescription of anticonvulsant drugs. Drug concentrations were hardly ever measured. Chronic side effects were rarely recorded. Family doctors are the gatekeepers to secondary health care, and can only provide a high standard within a structure offering good specialist services. The West of Scotland Epilepsy Research Group (WOSERG) has carried out an audit of patients with treated epilepsy in 25 general practices in Glasgow with a view to developing and setting up a shared-care programme.

METHODS

The protocol was designed by WOSERG, which included a number of general practitioners. The

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prototype was discussed at the General Practice Subcommittee of the Greater Glasgow Area Medical Committee who made suggestions for improvement. A letter of introduction was then sent to all general practitioners working in Glasgow. This outlined the aims of the study and invited them to allow perusal of their patients' records. The protocol had the approval of the West of Scotland General Practice Ethical Committee. A number of general practitioners agreed to take part. Practices were chosen to provide representation of the entire Glasgow population.

From March 1993 to February 1994 the audit was carried out by a research nurse. All the patient records from 25 practices were examined. Demographic and clinical details were obtained from computerized records of repeat prescriptions for antiepileptic drugs. Patients taking these drugs for other indications were excluded by reviewing their notes. Of the 25 practices examined, 21 used the computer system GPASS and the remaining 4 had VAMP.

Data were collected on a specially designed record form. The following information was obtained for each patient when available: (1) name, age and gender, (2) appropriateness of diagnosis, (3) specialist investigations, (4) classification of seizures, (5) duration of epilepsy, (6) history of birth injury, family history of epilepsy, febrile convulsions and any other potential aetiological factors, (7) current seizure control, (8) antiepileptic drug treatment, (9) attendances at hospital clinics, (10) referrals to Accident and Emergency Departments and hospital admissions. All data were later transcribed into a database created in Paradox for Windows.

Table 1: Practice sizes with the corresponding numbers of patients with epilepsy

Practice No.	Practice Size	No. of patients with epilepsy	Prevalence
001	4058	36	0.89
002*	4500	25	0.58
003*	4000	34	0.85
004	6934	44	0.63
005	7420	66	0.89
006	7150	55	0.77
007	2447	17	0.69
008	5535	38	0.69
009	6571	52	0.79
010*	8000	50	0.63
011	3467	17	0.49
012	1758	13	0.74
013*	3800	19	0.50
014*	4200	19	0.45
015	5650	37	0.65
016	3112	19	0.61
017	6078	34	0.56
018	3910	54	1.38
019*	5000	50	1.00
020	5947	57	0.96
021	7789	87	1.12
022	4697	26	0.55
023	7286	53	0.73
024	10911	66	0.60
025	15389	83	0.54
Total	145609	1052	0.72

* Estimated size of practices on more than one site.

RESULTS

Demography

The audit included a total population of 145 609 patients, 1052 (0.72%) of whom had treated epilepsy. The range of prevalences in individual practices is shown in Table 1. Five hundred and sixty-four (54%) patients were male and 488 (46%) were female. The age range in decades is illustrated in Fig. 1. There were 53 (5%) children, while 203 (19%) patients were over 65 years of age. At the time of analysis, 322 were married, 82 were divorced or separated, 277 were single and 66 were widowed or widowered. The marital status of the remaining 252 (24%) patients was not entered in the notes.

Employment details were available for 540 patients. One hundred and eighteen had jobs, 203 were retired and 219 were unemployed. The study also included 135 (13%) patients in whom the general practitioner had mentioned in the notes some degree of learning disability. The work status of the remaining 324 patients

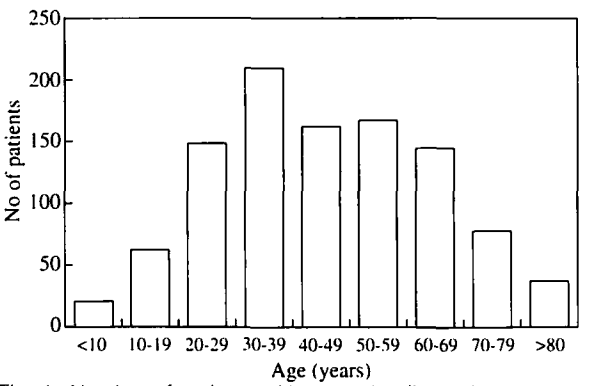

Fig. 1: Number of patients with treated epilepsy by age.

(excluding the 53 children) could not be ascertained from the notes.

Diagnosis

Three hundred and ten (29%) patients had been diagnosed as having epilepsy (Fig. 2) by a neurologist, 256 (24%) by a general physician, 110 (10%) by a paediatrician, 45 (4%) by a general practitioner, 38 (4%) by a neurosurgeon and 11 (1%) by a clinical pharmacologist with a specialist interest in epilepsy. A paediatric neurologist or a psychiatrist made the diagnosis in 7 (0.7%) patients, and 6 (0.6%) were diagnosed by a geriatrician. In the remaining 250 (24%) patients, no record was available of who had made the diagnosis of epilepsy.

Three hundred and two (29%) patients were diagnosed on clinical history alone. Two hundred and three (20%) had had an EEG performed as an aid to diagnosis. In 117 (11%) patients, one or more seizures had been witnessed. Twenty-six patients (2%) were started on an antiepileptic drug on the basis of a single seizure. Criteria for the diagnosis of epilepsy could not be found in the notes of 351 (33%) patients. Duration of antiepileptic drug therapy is shown in Fig. 3.

Seizures

Five hundred and thirty-one patients (50%) had tonic–clonic seizures only. Partial seizures occurred in 353 (33%) patients, 179 (17%) of whom also had secondarily generalized tonic–clonic seizures. Less common seizure types were generalized absences ($n = 49$; 4%) and myoclonic jerks ($n = 34$; 3%). Seventeen (2%) patients had akinetic seizures, and 14 (1%) were thought to

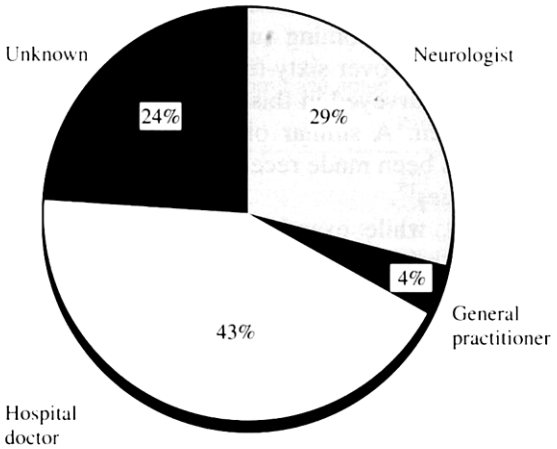

Fig. 2: Who made the diagnosis of epilepsy?

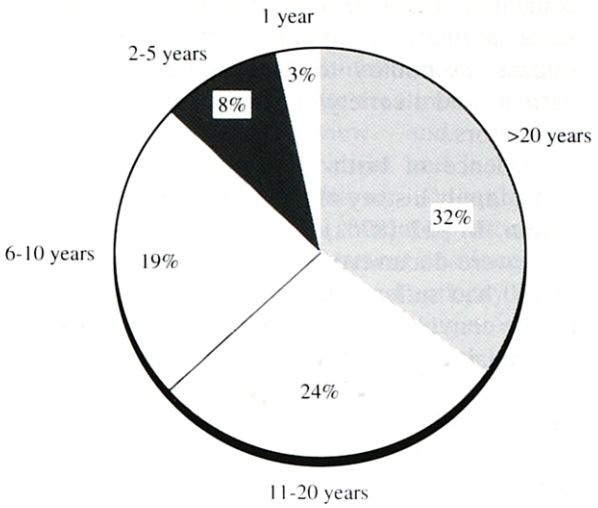

Fig. 3: Duration of antiepileptic drug treatment.

have pseudo-seizures. One hundred and thirty-seven patients were recorded as having more than one seizure type. In 121 (11%) patients it was not possible to deduce from the notes from what type of seizures the patient suffered. In only 414 (39%) patients was current seizure control documented in the case notes (Fig. 4). Of these, 302 patients (73%) were seizure-free. Another 33 reported more than five seizures per month. We were unable to obtain seizure frequency data for 61% of the patients.

Predisposing factors

In 627 (60%) patients a possible predisposing factor for the seizure disorder was identified. A major contributing factor was head trauma ($n = 185$). Alcohol abuse was considered to be relevant in 151 patients and 86 had suffered a cerebrovascular accident. Forty-two had had encephalitis or meningitis, 26 a neoplasm, 25 a

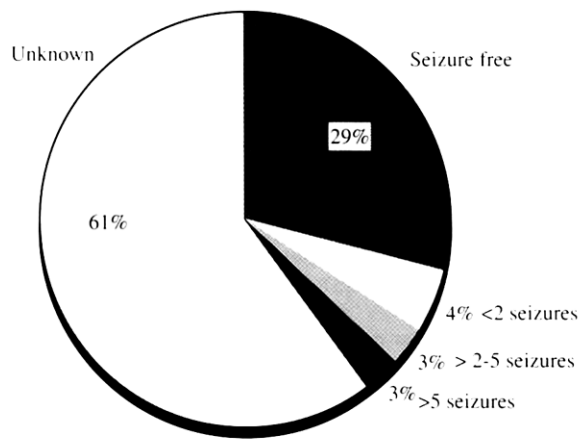

Fig. 4: Number of seizures per month.

congenital malformation, 23 cerebral atrophy and 22 a perinatal problem. Eleven patients had seizures secondary to drug abuse. Another 55 patients had a variety of other possible contributing factors.

Evidence of birth injury, febrile convulsions and a family history of epilepsy proved difficult to obtain. In 912 (87%) patients, no details of the birth were documented. In the remainder, 56 out of 140 had suffered birth injury. The figures for febrile convulsions showed a similar pattern with no available information in 925 (88%) patients. In the rest, 80 had not had febrile episodes, while 47 patients had. We were unable to obtain a family history of epilepsy in 758 (72%) patients. In 114 of the remaining 274 patients a family history of epilepsy was elicited.

Investigations

A total of 1466 surface electroencephalographic (EEG) examinations were carried out. Seven hundred and eighty-three patients (74%) had an EEG at some point in their history. Two hundred and fourteen of these had had two EEGs, 89 three, 43 four and 18 five. Sixteen patients had six or more EEGs. In 269 (26%) patients with treated epilepsy, there was no evidence to suggest that an EEG had ever been performed.

A total of 614 computerized tomographic (CT) brain scans had been carried out. Four hundred and thirty-four (41%) patients had had a CT scan performed. Three hundred and fifteen had one scan, 82 underwent a second, 25 a third, with 12 having four or more. One hundred and fifty-three patients had isotope scans, and 9 were noted to have had magnetic resonance imaging of the brain.

Table 2: Prescribed antiepileptic drugs

Drug	Patients
Carbamazepine	453 (43%)
Phenytoin	358 (34%)
Sodium valproate	227 (22%)
Phenobarbitone	160 (15%)
Primidone	49 (5%)
Lamotrigine	24 (2%)
Vigabatrin	24 (2%)
Clobazam	15 (1%)
Clonazepam	11 (1%)
Gabopentin	6 (1%)
Ethosuximide	5 (0%)
Potassium bromide	1 (0%)
Remacemide	1 (0%)
Tiagabine	1 (0%)

Treatment

Eight hundred and three (76%) patients were on anticonvulsant monotherapy and the remaining 249 (24%) took more than one drug [211 (20%) two drugs, 33 (3%) three drugs, 2 four drugs]. The most commonly prescribed drugs (Table 2) were carbamazepine (43%), phenytoin (34%), sodium valproate (22%) and phenobarbitone (15%). Monitoring of drug serum levels was recorded in the notes of only 353 (34%) of patients.

Hospital attendance

Eight hundred and ninety-eight (85%) of the patients had attended a clinic for their epilepsy at some point in their history. When the diagnosis was made, 717 (68%) patients were investigated at an out-patient clinic (48% neurology, 26% general medicine, 16% paediatric, 5% epilepsy, 4% neurosurgery, 1% psychiatry). The number of patients currently being seen at a hospital clinic was 296 (26%). This included neurology 134, epilepsy 59, general medicine 35, paediatric 32 and psychiatry 14. Overall, 172 (16%) patients had attended an Accident and Emergency Department due to a seizure. One hundred and eleven (11%) had been kept overnight in hospital. A total of 202 (19%) patients had been admitted to hospital at some time with seizures or complications.

DISCUSSION

The mean prevalence figure for treated epilepsy in the 25 practices scrutinized was 0.72%, which is a little higher than previously reported[7,8]. The range was 0.49–1.38%. The reasons for these differences were not obviously apparent. Today the elderly are becoming an increasing large part of society. The 'over sixty-fives' made up 19% of the patients surveyed in this audit, while only 5% were children. A similar observation in a Kent practice has been made recently by Cockerell and his colleagues[15].

McKee[16], while examining admissions to casualty at the Western Infirmary with a first seizure, found that 30% had alcohol as a possible predisposing factor. This may explain the male predominance in thie study, the high proportion of patients with head injury, and the substantial number with generalized tonic–clonic seizures. Most of the remaining patients had partial

seizures. Those with myoclonic epilepsy seemed under-represented[17]. The use of EEG and CT scans are important tools in classifying seizure type and identifying underlying pathology. Over a quarter of the patients had not had one of these investigations performed. Nearly 20% of the patients had been admitted to hospital due to their epilepsy. This provides a substantial contribution to the cost of epilepsy to the NHS[3].

The move towards monotherapy, proposed initially by Shorvon and Reynolds in 1979[18], is gaining momentum. However, this goal is still unobtainable in the 25% of patients with refractory epilepsy[19]. We were pleased to note that more than 70% of patients were established on just on antiepileptic drug. Only 35 patients were receiving more than two agents. It is, perhaps, not surprising that 20% were still taking barbiturate drugs. Although current seizure control was not documented in more than 60% of patients, it is likely that anticonvulsant therapy could be withdrawn successfully in a substantial number of the 994 patients receiving treatment for more than 5 years.

In this audit, we examined the case notes of more than 1000 patients with treated epilepsy. Overall, information was difficult to obtain since much of the necessary data were missing (Table 3), including seizure classification, aetiological factors contributing towards the development of epilepsy (particularly birth trauma and family history of epilepsy), and the number of seizures that the patient currently suffered. Accurate classification of seizure type, in particular, is important in assisting the appropriate choice of antiepileptic drugs[20].

CONCLUSION

Although it would be difficult to obtain unanimous agreement on how epilepsy should be managed, a consensus is emerging[5]. As with any chronic condition certain principles are accepted: rapid initial assessment, suitable investigation, safe diagnosis, appropriate treatment, regular follow-up, periodic review and effective communication with the patient and his or her family. The general practitioner is required to co-ordinate this exercise. A standard protocol for documenting the initial assessment and long-term follow-up of patients with treated epilepsy would help in providing optimal investigation and management for this vulnerable patient population. This will set out to guide clinical management and decision-making within a locally agreed framework of shared-care[21]. Such a system is being devised for Glasgow.

Table 3: Data missing from case notes

Question	Patients
Who made diagnosis?	250 (24%)
Criteria for diagnosis?	351 (33%)
Seizure classification?	121 (11%)
Seizure control?	638 (61%)
Predisposing factors?	425 (40%)
Family history?	756 (72%)
Birth trauma?	912 (87%)
Febrile convulsions?	925 (88%)
Electroencephalogram?	269 (26%)
Tomographic scan?	618 (59%)
Clinic attendance?	154 (15%)

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