Epilepsy in Hong Kong: a literature review

Objective. To review data on the causes, clinical features, and management of patients with epilepsy in Hong Kong.

Data sources. MEDLINE and Chinese Current Medical Contents were used to search the literature. A manual search of the Hong Kong Medical Journal, Hong Kong Practitioner, and Chinese Medical Journal (1982-2002) was also undertaken.

Study selection. Key words for the literature search were ‘epilepsy’ and ‘Hong Kong’.

Data extraction. All relevant articles in English or in Chinese language were reviewed.

Data synthesis. Overall, disease characteristics and the response to both medical and surgical treatments of epilepsy among local Chinese patients with epilepsy was found to be comparable to that reported for patients in western countries. Knowledge of epilepsy among the general population was more limited than expected from the international literature, and attitudes to epilepsy relatively more negative, adding to the psychosocial burden for people with epilepsy.

Conclusion. Further research in Hong Kong on aspects of epileptology is indicated with a view to developing more innovative and effective therapy.

Introduction

Existing knowledge on the epidemiology and treatment of epilepsy has been derived mainly from studies conducted overseas. However, differences in ethnic composition, disease prevalence, and socio-economic factors mean that the findings from these studies may not be entirely applicable to the Chinese communities. For example, in China around 50% of patients with epilepsy have no regular access to medical treatment. Local data are important in order to assess the magnitude of the problem and to target resources to patients and projects most in need. This article aims to summarise current knowledge of epilepsy in Hong Kong by reviewing relevant articles on the topic.

Methods

We performed a search of the electronic databases MEDLINE and Chinese Current Medical Contents using the key words ‘epilepsy’ and ‘Hong Kong’, and also conducted a manual search of both English- and Chinese-language journals (Hong
Epilepsy imposes an enormous psychological, social, and economic burden on patients and their families. One Hong Kong cost-of-illness study involved a retrospective cohort of 745 individuals treated medically from 1992 to 1996. Reported total direct costs were USD 0.98 million, and indirect costs USD 1.32 million during this period.17

Although the public’s perception of epilepsy is more positive in Hong Kong than in other Chinese communities, such as in China and Taiwan, it appears to be more negative than in western societies. A recent study in Hong Kong of 1128 members of the public without seizures and without relatives with epilepsy, found that 71% of respondents believed that epilepsy was an inheritable disorder, and 57.7% considered inserting an object into the person’s mouth during an attack constituted appropriate first aid.16 Attitudes towards people with epilepsy were also studied: 32.2% indicated they would not allow their children to marry individuals with epilepsy, 27.5% considered pregnancy to be inappropriate for an individual with epilepsy, and 22.5% of employers indicated they would terminate an affected worker’s employment contract. A belief peculiar to Chinese communities is that mutton consumption during pregnancy can lead to epilepsy in the offspring. Two percent, mainly older respondents, believe that epilepsy is due to possession by evil spirits.

A study of 70 individuals with epilepsy in Hong Kong using the Washington Psychosocial Inventory revealed that many patients had difficulties with emotional, interpersonal, vocational, and financial adjustment.19 Discrimination was reported by 70% of patients as a direct result of having epilepsy.19

Epilepsy also affects carers. Three quarters of carers interviewed in a recent Hong Kong study were found to have low scores on the Chinese versions of the Epilepsy Outcome Scale and the World Health Organization Quality of Life Measure.20 Severe depression was also found in 14%.

Clinical features
A large retrospective review was undertaken of 2952 patients with epilepsy over the age of 10 years seen at eight public hospitals with a neurological service. Primary and secondary generalised tonic-clonic convolution was the most common seizure type—presumably as this is the most readily recognised type.4 Complex partial, simple partial, and myoclonic seizures occurred in 28.3%, 14.4%, and 1.4% of cases, respectively. Overall, mental retardation was found in 14.1% and cerebral palsy in 2.1% of patients; these two figures were twice as high in the subpopulation with refractory epilepsy. Approximately one fifth (20.3%) had refractory epilepsy as defined by persistent seizures despite appropriate treatment with at least two drugs.5 This compares favourably with findings from prospective studies in western countries.21

In childhood epilepsy, abnormal neurodevelopmental status and the presence of more than three seizures in the second 6-month period after treatment have been identified as early predictors of intractability.22 Wong14 found that 7.6% of children with autistic spectrum disorder have recurrent seizures, and Kwong and Wong15 reported only two of 124 children with Down’s syndrome reviewed suffered from epilepsy (due to Lennox–Gastaut syndrome and infantile spasms), a percentage which is notably lower when
compared with the case series reported in white patients. Among 105 children with West syndrome studied in Hong Kong, the majority had a poor outcome—multiple disabilities in 16 cases, cerebral palsy in 22, mental retardation in 94, and Lennox-Gastaut syndrome in 13.

A retrospective review of 37 Chinese children admitted to a hospital in Hong Kong with the diagnosis of status epilepticus (SE) from 1989 to 1993 found a mortality rate of 11%. Death in these cases was attributed to the underlying aetiology rather than to seizures per se.26 Neurological complications were reported in 27%. Acute CNS pathologies were the most common cause (observed in 60%), followed by idiopathic (11%), pre-existing CNS insult (13%), febrile illness (5%), and progressive encephalopathy (11%). The authors concluded that the outcome was favourable in patients with normal baseline neurological status, and without acute CNS insult or progressive encephalopathy.

Among adults presenting with SE, the most common identifiable aetiologies were cerebrovascular disease (23%), lack of compliance with anticonvulsants or drug withdrawal (15%), and metabolic derangement (12%); alcoholic-related SE was noted to be uncommon when compared with series from the US and Europe. Of the 107 cases reviewed, 82 (77%) required admission to the intensive care unit, with a mean stay of 3.6 days, and 65 patients (61%) required ventilation, with a mean duration of 2.7 (standard deviation, 5.6) days. Increasing age, delay in treatment, SE due to cerebrovascular disease, and CNS infection were associated with poor outcome (mortality and/or morbidity). Non-convulsive SE has also been reported, highlighting the importance of electroencephalography (EEG) in patients with altered mental status.28-30

Medical management

The majority of patients with epilepsy in Hong Kong are managed in the public sector.31 First-line antiepileptic drugs are the mainstay of therapy but there are no local randomised controlled trials investigating the use of these therapeutic agents. Data obtained from the 1997 Hong Kong Epilepsy Registry survey indicate that the four most commonly prescribed antiepileptic drugs are phenytoin (38.7%), carbamazepine (32.8%), valproate (22.4%), and phenobarbital (11.1%). Monotherapy is used in the majority of cases (57.4%). The effects of phenytoin, as measured by brain-stem auditory evoked potentials, have been studied in local patients. Chan et al demonstrated that phenytoin produces abnormalities both peripherally on the auditory nerve/cochlea, as well as centrally on brain stem conduction.

Kumana et al conducted a comparison study of diazepam pharmacokinetics in healthy Chinese and white volunteers. Serum concentrations of diazepam and desmethyldiazepam were measured using enzyme-linked immunoassay and high-performance lipid chromatography. Mean peak diazepam concentration (Cmax) was similar in both groups but in the Chinese group, mean diazepam apparent volumes of distribution were smaller and time to Cmax (tmax) was more often prolonged. The authors attributed these differences to the greater body fat and stature of those in the white volunteer group.

The effects of more recently developed antiepileptic drugs, topiramate, and vigabatrin have been studied in local patients. Thirty children with intractable seizures received vigabatrin as add-on treatment; the epilepsy was cryptogenic in 16 cases and symptomatic in 12. Vigabatrin 40 to 80 mg/kg per day was titrated according to clinical response for up to 2 years. Overall, 43% of children experienced a 50% to 75% reduction in seizure frequency. There was no relationship seen between response to vigabatrin therapy and age of onset, type of seizure, aetiology, and presence/absence of mental retardation. A small, observational study has also indicated that vigabatrin is effective for treating infantile spasms.

Topiramate was also used as an add-on therapy in a multi-centre open-label trial of 103 patients, including the local Chinese patients.36 Of these patients, 53% had a more than 50% reduction in seizure frequency, 31% had a 75% reduction, and 12% became seizure free. In contrast to studies from the West, there were no reports of gastro-intestinal upset, speech disturbance, or psychomotor slowing, but the overall withdrawal rates were similar at 7%.

A prospective trial looked at the effect of increasing anticonvulsant medication dose in seizure-free cases with low serum anticonvulsant levels. Seventy-nine subjects were randomised to either:
(1) a study arm in which drug levels were maintained in the subtherapeutic range; or
(2) another arm in which the dose was increased until the therapeutic range was reached.

The study showed that the dose increment did not lead to significant improvement in seizure control but did lead to the occurrence of more neurotoxic side-effects. These results suggest that increasing the anticonvulsant therapy dose in a patient with relatively well-controlled epilepsy is unnecessary. The need for expensive drug monitoring could also be reduced.

An increased risk of thrombocytopenia with valproate therapy has also been described in a Hong Kong population. Children with a trough level of 450 µmol/L or above, or a daily dose of 40 mg/kg or above, were shown to be more likely to develop thrombocytopenia, although the thrombocytopenia was mild in most cases.

Surgical management

Investigations such as EEG, CT, and magnetic resonance imaging (MRI) are widely available in Hong Kong, while long-term video-EEG monitoring, single photon emission computed tomography and positron emission tomog-
rathy are performed in a growing number of specialist centres.6,39,40 Vagus nerve stimulation is an adjunctive treatment for patients with refractory partial-onset seizures who are not suitable for epilepsy surgery.41 The procedure was first introduced in South-East Asia in Hong Kong during the mid-nineties, with results comparable to those reported overseas.41,42 In patients with an epileptic syndrome amenable to surgery, resection is the most effective mode of therapy; those with mesial temporal lobe abnormalities on MRI were more likely to proceed to surgery than those with extrahippocampal lesions.40 Results from one surgical centre showed that eight of 11 patients became seizure free following temporal lobe resection for intractable epilepsy.43 Nine of these reported significant improvement in social functioning as a result. No major postoperative complications or deaths were reported in this series.

Using the Chinese version of the World Health Organization Quality of Life Measure Abbreviated Version, validated in Hong Kong, Ho et al44 found that the quality of life of participants after successful surgery was still poorer than that of 157 healthy controls, suggesting that additional factors are important in determining quality of life other than seizure control alone.

Discussion

Data from studies over the past decade have provided a clearer picture of the clinical characteristics of patients with epilepsy in Hong Kong. One of the most valuable contributions has been made by the territory-wide survey conducted in 1997 which showed that overall, clinical features of epilepsy (such as seizure types and prognosis) in patients in Hong Kong appear to be comparable to those of their western counterparts.6 The effectiveness of antiepileptic drugs and surgery, a further major focus of research activities again has yielded similar findings to those reported overseas. This suggests that broadly speaking, disease characteristics and the response to treatment among local Chinese patients with epilepsy can be expected to be comparable to that seen in western countries. This helps to validate the extrapolation of findings generated in Europe and North America to the Chinese populations and vice versa. Important differences, including differences in pharmacokinetic profile, and attitude to and knowledge of the condition do exist, however.

Differences seen in pharmacokinetic profile were attributed to differences in body composition in one study.33 Genetic polymorphisms contribute significantly to variations in drug response in both pharmacokinetic and pharmacodynamic terms among ethnic groups.45 For instance, polymorphisms in the hepatic cytochrome P450 enzyme system result in differences in the metabolism of phenytoin.46 There is also considerable ethnic variation in the frequency of polymorphism of the MDR1 gene.47 This gene has been shown to be associated with response to drug therapy in patients with epilepsy, and it is possible that such genetic variations might influence the response to specific antiepileptic drugs in different ethnic groups.47,48

Differences in public attitude towards patients with epilepsy between Hong Kong Chinese and their western counterparts reflect underlying cultural differences in the perception of this condition.18,19,49,50 The Hong Kong Epilepsy Association and the Community Rehabilitation Network are non-governmental organisations that offer advice and support to people with epilepsy and their families in the form of quarterly newsletters, regular group and educational meetings, and a website (http://www.hkepilepsy.com). Local studies concerning public knowledge of epilepsy and attitudes towards people with epilepsy should be encouraged since they have direct relevance to health education and promotion. These studies have a valuable role in our efforts to bring epilepsy “out of the shadows.”51

Future research directions

Despite the efforts of clinicians over the past decade, knowledge gaps are clearly evident in many important aspects of epileptology. Understanding epileptogenic mechanisms through insights from genetics, imaging, electrophysiology, and developmental biology has been identified as the key to developing more innovative and effective therapies.52 In keeping with this overall strategy and to produce data that are directly applicable to the Chinese communities, future research in Hong Kong should focus on the following directions:

1. Epidemiology: one of the priorities is a community-based prevalence and incidence study. Without such information, sensible allocation of resources cannot be made for clinical service and research purposes.

2. Natural history: the natural history of epilepsy in response to treatment is still poorly understood. Hong Kong has a major methodological advantage in this regard since it is routine practice for patients presenting with a first seizure to be admitted to hospitals for investigation and observation. The majority of in-patients with epilepsy are managed in public hospitals, where medical records are linked by a territory-wide database;

3. Genetics: a growing number of gene mutations associated with familial epilepsy syndromes have been identified. Genetic polymorphisms may play an important role in disease susceptibility, as well as response to drug treatment. Ethnic variations in these polymorphisms should be studied so that pharmacogenetically based prescription may be realised;

4. Psychosocial aspect: there is a growing trend to include psychosocial outcome in the evaluation of treatment effectiveness; psychometric testing is also an essential part of presurgical evaluation. Many of the tools for assessment of psychological function and quality of life have not been translated and validated among Chinese patients; and

5. Basic science: there has been a lack of basic research on epilepsy in Hong Kong. Investigation in this area is
needed for a better understanding of the mechanisms of seizures and epileptogenesis.

References


