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Epidemiological study of multiple sclerosis in Hong Kong Chinese: questionnaire survey

香港華人多發性硬化症的流行病學研究：問卷調查

Objective. To study the epidemiology of multiple sclerosis in Hong Kong Chinese.
Design. Cross-sectional questionnaire survey.
Setting. Neurology and paediatric neurology departments in Hong Kong from January through June 1999.
Participants. All confirmed multiple sclerosis patients.
Main outcome measures. Demographic data, investigation results, Kurtzke's Expanded Disability Status Scale during the last follow-up visit, number of relapses between 1997 and 1998, and treatments used/currently in use.
Results. Fifty-three Chinese multiple sclerosis patients were identified. The prevalence was thus estimated to be 0.77 per 100 000 population. This low prevalence was also noted in other multiple sclerosis studies from South-East Asia (range, 0.8-4 per 100 000 population). The female to male ratio among the Chinese multiple sclerosis sufferers was 9.6:1, a figure somewhat higher than that reported in the other studies from South-East Asia (range, 3.2-6.6:1). The Chinese multiple sclerosis patients in this study also had a high spinal cord involvement (66%) and a low presence of cerebrospinal fluid oligoclonal banding (40%). These findings were different from those in Caucasian multiple sclerosis patients.
Conclusion. Multiple sclerosis in Hong Kong Chinese has a low prevalence, a high female to male ratio, and a low cerebrospinal fluid oligoclonal banding presence.

目的：研究香港華人多發性硬化症的流行病學。
設計：橫向問卷調查。
安排：1999年1月至6月期間在香港診治多發性硬化症患者的所有腦內科醫生和部份兒科腦內科醫生。
參與者：所有確診的多發性硬化症患者。
主要結果測量：人口學數據，調查結果，最後跟進查訪期間患者Kurtzke擴大的殘障狀態等級，1997和1998年間復發的次數，已使用過的和目前正在使用的治療。
結果：已確定有 53 名華人患有多發性硬化症，因此流行率估計是每 10 萬人口 0.77 。東南亞地區的其他多發性硬化症研究也有相同的低流行率(範圍：每 10 萬人口0.8-4)。在華人多發性硬化症患者中女性與男性的比例為9.6:1，這比例高於東南亞研究中所報告的數據(範圍：3.2-6.6:1)。本研究中的華人多發性硬化症患者涉及脊髓較多(66%)，而出現腦脊液少突細胞交換的情況較少(40%)。這些發現與白人多發性硬化症患者中的結果是不同的。
結論：香港的華人多發性硬化症流行率低，女性比男性的發病比率較高，以及出現腦脊液少突細胞交換的情況較少。

Key words:
Epidemiology;
Hong Kong;
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關鍵詞：
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Introduction

Multiple sclerosis (MS) is a particularly devastating disease of the central nervous system (CNS), as it strikes predominantly young adults during their most productive years. Even when patients are asymptomatic, they cannot predict when their condition will relapse again. The use of interferon and other immunomodulating therapies has been shown to be effective in the treatment of MS. For

example, studies have clearly shown that patients on interferon treatment have significantly longer mean symptom-free periods, shorter hospitalisation stays, and less burden of disease according to magnetic resonance imaging (MRI) brain scans.[1-4] However, these trials involved Caucasian MS sufferers, and to date there have been no controlled trials of interferon treatment in Chinese MS sufferers. Although it is tempting to assume that Chinese MS patients will respond to interferon treatment in the same way as their Caucasian counterparts, a study in Japan has shown that not only do Asians have a lower prevalence of the disease, but also a different pattern, suggesting heterogeneity in the immunogenetic background.[5] Accordingly, this survey was designed to study the prevalence of MS in Hong Kong Chinese and to characterise the clinical features of the disease.

Methods

Between January and June 1999, a territory-wide, cross-sectional survey of MS patients in Hong Kong was carried out among all neurologists and some paediatric neurologists who look after paediatric MS patients. Questionnaires concerning patients' demographic and clinical characteristics were compiled. Investigation results including computed tomography (CT), MRI, evoked potential studies, and lumbar puncture studies (cerebrospinal fluid [CSF] oligoclonal banding) were also documented. Patients' clinical status, ie degree of neurological impairment, were assessed using Kurtzke's Expanded Disability Status Scale (EDSS).[6] The number of relapses patients experienced over a 2-year period (1997-1998) were recorded, as were their past and present treatment.

In some hospitals where there was no neurologist, the questionnaires were sent to physicians with an interest in neurology. To ensure that they were fully completed, the questionnaires were followed-up by telephone. Hospital visits and reviews of case notes were carried out on demand to confirm the diagnosis and current status of MS sufferers. Patients remained anonymous throughout the data collection process, thereby protecting their privacy, and only those who had been followed-up in the 2 years prior to the study (ie 1997-1998) were included in the survey.

Results

Fifty-three Chinese MS patients were identified, of whom 48 were women and five were men. Fifty-one patients already had their diagnoses established by neurologists, while the two remaining MS sufferers had their diagnoses confirmed after neurologists had the opportunity to review their hospital records. Two non-Chinese (Caucasian) MS patients were also identified, but were not recruited to this survey.

The patients' demographic and clinical characteristics (Tables 1 and 2), evoked potential and CSF oligoclonal banding results (Table 3), and use of immunomodulating therapies (Table 4), are summarised. Two patients had a family history of the disease. For each patient, the clinical course of the disease was classified according to the criteria suggested by Poser et al[7]: relapsing-remitting type; secondary progressive type; primary progressive type; or progressive relapsing type.

Table 1. Demographic characteristics of Chinese multiple sclerosis patients in Hong Kong

Demographic characteristic	
Female:male	9.6:1
Age of onset of symptoms (years)	29.4 (range, 11-60)
Age of diagnosis (years)	32.8 (range, 13-64)

Table 2. Clinical characteristics of Chinese multiple sclerosis patients in Hong Kong

	Patients, n=53 No. (%)	
Clinical course		
Relapsing-remitting	38 (72)	
Secondary progressive	9 (17)	
Primary progressive	4 (8)	
Progressive relapsing	2 (4)	
Signs and symptoms	*At onset*	*During the course*
Limb weakness	34 (64)	36 (68)
Paraesthesia	35 (66)	36 (68)
Blurring of vision/ blindness/scotoma	24 (45)	27 (51)
Vertigo	1 (2)	2 (4)
Dysphasia	1 (2)	1 (2)
Sphincter dysfunction	5 (9)	19 (36)
Ataxia	3 (6)	6 (11)
Facial palsy	1 (2)	2 (4)
Partial transverse myelitis	22 (42)	35 (66)
Cerebellar lesion	12 (23)	13 (25)
*EDSS**	*On diagnosis*	*During last visit*
0-3.0	34 (64)	29 (55)
3.5-5.0	11 (21)	9 (17)
5.5-6.0	4 (8)	3 (6)
6.5-7.0	2 (4)	3 (6)
7.5-8.0	2 (4)	8 (15)
8.5-9.0	0 (0)	1 (2)
>9.0	0 (0)	0 (0)

* EDSS Kurtzke's Expanded Disability Status Scale

Table 3. Investigations in multiple sclerosis

	Abnormal No. (%)	Total No.
Evoked potential studies		
Visual evoked potential	26 (67)	39
Brainstem auditory evoked potential	11 (32)	34
Somato-sensory evoked potential	18 (62)	29
Cerebrospinal fluid oligoclonal banding	10 (40)	25

Table 4. Use of immunomodulating therapy

Immunomodulating agents	Used	Currently used
Interferon-beta	13	8
Azathioprine	13	3
Cyclosporin	1	-
Copolymer I	1	-
Intravenous immunoglobulin	1	-
Adrenocorticotrophic hormone	1	-

Investigations

Fifty-two of the 53 patients had MRI and/or CT scans of the brain/spinal cord. Of these, 46 (ie 88% of the total number of patients and 87% of the number with scans) had

abnormalities that were compatible with the diagnosis of MS. These patients belonged to the clinically definite diagnostic group that had laboratory-supported evidence. The remaining seven patients belonged to the clinically possible diagnostic group, because some investigations, such as MRI, were not performed. Thirty-five patients had paraesthesia at the onset of their disease indicating spinal cord involvement. Nineteen (36%) patients had selective involvement of their optic nerves and spinal cords. Of these, four (7.5%) had normal MRI brain scans, and were included because they satisfied the diagnostic criteria.

The questionnaire revealed that only 25 (47%) of the 53 patients had their CSF sent for oligoclonal banding, a test that helps confirm the diagnosis of MS. Of these, 10 (40%) had banding present, namely: four (40%) out of 10 patients who presented during a relapsing phase of their disease; and six (40%) out of 15 patients who presented during a non-relapsing phase of their disease.

Clinical status

The mean EDSS was 3.0 (range, 0-8.0) at the time of diagnosis, increasing to 3.6 (range, 0-8.5) by the last follow-up visit. In other words, these MS patients, who on average started with moderate disability were more disabled after 2 years, although they still remained ambulatory. The mean number of relapses within the 2-year period (1997-1998) was 1.1.

Discussion

Hong Kong has a population of 6.8 million people, of whom more than 99.7% are of southern Chinese origin. This study thus shows that the prevalence of Chinese MS sufferers is at least 0.77 per 100 000 population. There are 42 hospitals in Hong Kong, of which 11 are general hospitals receiving referrals. For complicated diseases, such as MS, patients will most likely be referred to these hospitals. Hence, we targeted all the neurologists at these 11 referral hospitals and followed-up our questionnaires by telephone.

In the event, the neurologists and their hospital notes provided a comprehensive catchment for all MS patients in Hong Kong. At the time the survey was conducted (1999), there were 35 neurologists in Hong Kong. This group formed a small scientific community characterised by frequent academic and social meetings. Moreover, they had a track record of frequent, successful collaborative studies for diseases, such as epilepsy, stroke, tuberculous meningitis, and Creuztfeldt-Jacob disease. Added to this, all relevant records in public hospitals had been computerised and coded using the International Classification of Disease coding system. When MS patients were at an advanced stage of their disease, ie with high EDSS step and much debilitation, they were cared for by the out-reach medical staff of public hospitals, the Community Geriatric Ambulatory Team.

It is possible that information from one neurologist who looked after another two MS patients was overlooked. When we cross-checked our data with the only MS patient support group in our locality, the number of participants was small, and all were under the care of (known) neurologists.

The Chinese MS patient population is a very specific and highly selected group. Because of its small size, we tried to identify every individual through stringent diagnostic criteria, and then only to count those who were being actively followed-up, as this would provide maximum patient information. Those MS sufferers who did not attend any follow-up, or who were being followed-up under the care of private practitioners, would thus have been beyond the reach of our survey. However, we believed this number to be very small, as the treatment provided by public hospitals was relatively inexpensive and also of a high standard.

A study reported by Yu et al[8] in 1989 found that the prevalence of MS in Hong Kong Chinese was 0.88 per 100 000 population. Hence, the local prevalence of MS in Chinese appears to have remained persistently low over the intervening 10-year period. Our study also showed a high female to male ratio of MS sufferers (9.6:1). In 1999, the female to male ratio among the general population of Hong Kong was 49.7:50.3. This combination of a low prevalence of MS and a high female to male ratio has also been observed in several other South-East Asian cities/countries (Table 5).[5,8-12] In each case, the female to male ratio is much higher than in western MS, where it is about 1.5:1. We thus conclude that low prevalence and high female to male ratio are two characteristics of MS in Asians. The prevalence of MS in the West varies from 5-25/100 000 in Italy to 59-103/100 000 in Sardinia.[13] Comparatively, Asian MS has a much lower prevalence.

Notably, less than half of the patients had their CSF sent for oligoclonal banding, which was present in 40%, regardless of whether they were in a relapsing or non-relapsing phase of their disease. This figure is much lower than that reported for western MS, in which about 80% to 90% of patients show positive banding. However, positive banding in the CSF is not a pathognomonic feature for MS, and nowadays many patients will be investigated with MRI instead of a lumbar puncture.

Most (72%) patients in this study had relapse-remitting–type MS, of whom a further majority (71%) had EDSS steps between 0 and 5.0, meaning that they remained ambulatory. Caucasian MS patients with these disease characteristics

Table 5. Demographic characteristics of multiple sclerosis in Asia

City/country	Prevalence (per 100 000 population)	Female:male
Hong Kong	0.77*-0.88[8]	9.6:1*
Malaysia[9]	2	6.6:1
Thailand[10]	2	4:1
Japan[11]	4	2.1:1[5]
Taiwan[12]	0.8	3.2:1

* Data from this study

are generally expected to benefit from receiving immunomodulating therapy. Whether this is also true for their Chinese counterparts depends, of course, on the degree of similarity between the two disease types.

Conclusions

This study has shown that the prevalence of MS in Hong Kong Chinese was at least 0.77 per 100 000 population. Taken together with the observed high female to male ratio of sufferers and low CSF oligoclonal banding presence compared to that observed in western MS, these findings may imply heterogeneity in the immunogenetic background of the disease. Accordingly, the response of Chinese MS patients to interferon treatment will be important to note.[5] Given the small number of patients identified, a randomised, placebo-controlled trial to test the efficacy of interferon among Chinese MS sufferers in Hong Kong is not feasible.[14] Collaboration with other areas and countries is necessary.

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