

Asian neurology as a discipline of study

Chong Tin TAN *FRCP MD*

Department of Medicine, Faculty of Medicine, University of Malaya

Abstract

Asian neurology should be viewed as a discipline of study. This is because ethnic, geographical, environmental, social and cultural factors influence neurological disease causation, manifestation, outcome, treatment, and clinical practice. Ethnic factor affecting disease pathology is reflected in severe spinal cord involvement as a universal feature of Asians with multiple sclerosis, and intracranial stenosis as a common pathological feature of Asians with stroke. Geographical and environmental factors influencing disease occurrence is reflected in the peculiar causes of central nervous system infections in the Asian patients. The large treatment gap in epilepsy among many Asian populations, and attribution of “heatiness” and sun exposure to causing headache in Malaysia are example of social cultural factors influencing disease outcome and treatment. Unlike tropical medicine and tropical neurology, Asian neurology is not rooted in colonial history. Asian neurology can be defined as the medical science applied to neurological diseases occurring primarily in Asia, and aspects of diseases peculiar to Asia. The field of study should include epidemiology of neurological diseases in Asia, neurological diseases occurring primarily in Asia, aspects of neurological diseases peculiar to Asia, and related basic sciences. It should be given priority in research and publication in Asian neuroscience community.

Asian Neurology should be viewed as a discipline of study. This is because ethnic, genetic, geographical, climatic, environmental, ecological, social and cultural factors influence neurological disease causation, manifestation, outcome, treatment, and clinical practice.

ETHNIC FACTORS AFFECTING DISEASE PREVALENCE AND MANIFESTATION

Ethnic and genetic factors affecting disease pathology and manifestation is seen in many neurological diseases in Asia. Multiple sclerosis is one of the most important clinical problems in neurology practice in the West. On the other hand, in a study on the spectrum of neurological diseases in Thailand, there was only 0.1% patient encounter as compared to 6% for neurologists in United Kingdom.¹ A joint Asia study has reported severe spinal cord involvement as a universal feature of Asians with multiple sclerosis. The mean length of spinal cord lesion on MRI was 3.8 vertebral segments for optic-spinal recurrent, and 2.9 for Western forms of multiple sclerosis among Asians.² Long segment of spinal cord involvement is unusual in classical multiple sclerosis among Caucasians. The recent diagnostic criteria from the International Panel on the Diagnosis of Multiple Sclerosis mentioned that the spinal cord

lesion should be under two vertebral segments in length.³ This would have excluded many Asian patients with multiple sclerosis.

There has been a number of studies confirming that whereas the Caucasians have more severe diseases of the large extracranial arteries, intracranial pathologies is more common among the Orientals.⁴⁻⁶ In a Hong Kong stroke study, 33% of patients had intracranial occlusive diseases and 6% had extracranial carotid stenosis.⁶ A recent imaging and microembolic study suggests that occlusion of a single penetrating artery to produce a small subcortical lacuna-like infarct and an artery-to-artery embolism with impaired clearance of emboli that produces multiple small cerebral infarcts, especially along the border zone region may be the common stroke mechanisms in patients with middle cerebral artery stenosis.⁷ Intracranial occlusive disease has also been found to be predictive of further vascular events or death.^{8,9} A recent study showed that the risk of recurrent stroke during the first year for those with intracranial stenosis was 17.1%; 24.3% for those with intracranial and extracranial atherosclerosis, as compared with 10.9% for patients without vascular lesion.⁹ The common occurrence of intracranial stenosis also have implication on Asian neurology practice. As transcranial Doppler ultrasound has been found

to be a safe, reliable and relatively low cost tool for diagnosis of intracranial occlusive disease⁹, it is an invaluable diagnostic tool for neurology practice in Asia.

There are numerous other examples of the importance of ethnicity in neurological diseases. In spinocerebellar ataxias (SCAs), the distribution of SCA loci differs among various ethnic groups. SCA 3 was found to be common among Chinese in China, Taiwan and Singapore. On the other hand, SCA 2 was more common in India and Korea, and SCA 3 and 6 in Japan.¹⁰ The prevalence of Huntington's disease in the West is estimated at 5-10 per 100,000 population. It is much lower for countries in Asia.¹¹ Periodic paralysis is not an uncommon complication among Oriental males with thyrotoxicosis, whereas it is rare among the Caucasians.^{12,13} Within the multi-ethnic population of Malaysia, systemic lupus erythematosus has been found to be more common among the Chinese versus the Indians.¹⁴ Similarly, nasopharyngeal carcinoma and the associated post-irradiation bulbar palsy are mainly seen among Chinese.¹⁵

GEOGRAPHICAL, CLIMATIC, ENVIRONMENTAL, AND ECOLOGICAL FACTORS AFFECTING DISEASE CAUSATION

This is best exemplified with the many infective diseases, seen commonly though not exclusively in Asia. Many of these infections have animals as reservoirs requiring insect vectors for transmission and with complicated life cycle. Thus, neurocysticercosis and Japanese encephalitis are related to pigs, rabies requires bites from rabid dogs, toxoplasmosis from cats, malaria and Japanese encephalitis requiring mosquitoes as vectors of transmission. The mosquito population is influenced by socio-economic factors as well as climatic change.

The recently emergent Nipah encephalitis illustrate the importance of ecological environment. In the outbreak of Nipah encephalitis in Malaysia in 1998 and 1999, close contact with pigs was responsible for viral transmission to humans.^{16,17} The reservoir of Nipah virus is very likely the Pteropus fruit bat.¹⁸ It has been proposed that the slash-and-burn deforestation resulted in the formation of a severe haze that blanketed much of South East Asia in the months preceding the Nipah virus disease outbreak. This was exacerbated by a drought driven by the severe 1997-1998 El Nino Southern Oscillation (ENSO) event lead to a reduction in the availability of

flowering and fruiting trees for foraging by fruit bats, and culminated in unprecedented encroachment of fruit bats into cultivated fruit orchards. The location of piggeries in orchards allowed transmission of the paramyxovirus from its reservoir host to the domestic pigs and ultimately to the human population.¹⁹

The influence of environmental factor is not limited to infective diseases. Snake bite is mainly seen on the feet and ankles among agricultural workers in the rural area. Lathyrism, occurring in Asia mainly in the Indian subcontinent, is a disorder of central motor pathway caused by excessive consumption of grass or chickling pea. It usually occurs in adverse environmental conditions such as following flood or draught, resulting in dependency on the hardy grass pea for food.²⁰

SOCIAL AND CULTURAL FACTORS AFFECTING DISEASE CAUSATION, MANIFESTATION, OUTCOME, TREATMENT AND CLINICAL PRACTICE

Social factors affect disease causation. This is exemplified by tuberculosis and leprosy, which remains prevalent in many parts of Asia, is related to poverty and overcrowding. Cultural concepts of health and disease can cause specific illnesses. Examples are amok, latah and koro, classical diseases of culture bound syndrome found in South East Asia. Amok affects mainly Malay men, who has episodes of violent behaviour and sometimes dangerous use of weapons, with amnesia of the episodes. Latah affects adult Malay women, where on tapping the shoulder or a shout, become confused and emulate whatever action her "tormentor" is making. Koro affects young Chinese men, who are seized by the belief that his penis is retracting into the abdomen and should this happen, he would die. He thus desperately employs every physical means to prevent this retraction.¹²

Concepts of health and disease also affect disease outcome, treatment and clinical practice. This is seen in epilepsy treatment gap. Epilepsy treatment gap is the percentage of persons with active epilepsy who at any one time are not receiving anticonvulsant treatment.²¹ It is believed that there is high epilepsy treatment gap particularly among the rural populations in Asia. A recent door-to-door survey in China showed a treatment gap of 63%.²² Other than costly drugs and poor access to medical services, negative public attitudes towards epilepsy and concepts of

the cause and treatment are likely to contribute to the large treatment gap.^{22,23}

Headache is another disease where concepts of disease affect disease causation, and treatment. In a community survey in Malaysia, 52% of subjects with migraine and 56% with tension headache attributed their headache to sun exposure.²⁴ In a community based inter-cultural study of headache in Malaysia and Australian, significantly more Malaysian headache sufferers attributed their headaches to heat, exposure to sun, fried food, mutton and other “heaty” food. There were also significantly more Malaysian subjects who resorted to drinking lots of water and taking other “cooling” food as remedies for headache. This was consistent with the common cultural belief among Malaysians that “heatiness” causes headache.²⁵

THE DEBATE ON TROPICAL MEDICINE

Any discussion on Asian neurology as a discipline of study must involve the related disciplines of tropical medicine and tropical neurology. There has been recent debate on the continuing relevance of tropical medicine, whether tropical medicine as a formal discipline should be abandoned.²⁶ Similarly tropical neurology is languishing as a discipline of study.²⁷ The main arguments for abandonment of tropical medicine are that the discipline was formulated during end of nineteenth century to protect the health of the colonial subjects working and living in the tropics. Presently, it no longer reflects the medicine of the tropics. With the decline of the colonial powers, the future of the discipline is in demise. The term “tropical” is a misnomer, Western or Euro-centric. It covers temperate South Africa, but excludes tropical Australia. Furthermore, many diseases now categorized as tropical formally existed in temperate parts of the world, Britain included, an example is malaria. It is more accurately termed medicine of the developing world. The main arguments for maintaining tropical medicine as a discipline include that it is based on geography and climate, which define a population at risk, similar to aviation medicine or military medicine.²⁶

Unlike tropical medicine and tropical neurology, Asian neurology is not rooted in colonial history, and is not Western or Euro-centric. It is based on many unique features of Asia, with important differences in genes, geography, environment, social characteristics and culture.

ASIAN NEUROLOGY DEFINED

Asian neurology can be defined as the medical science applied to neurological diseases occurring primarily in Asia, and aspects of diseases peculiar to Asia. The field of study should include epidemiology of neurology diseases in Asia, neurological diseases occurring primarily in Asia, aspects of neurological diseases peculiar to Asia, and the related basic sciences. It should cover the causation, manifestation, outcome, treatment and clinical practice of these diseases, due to ethnic, genetic geographical, environmental, ecological, social, cultural, or economic influences.

For the discipline to grow and prosper, Asian neurology must be given high priority in research and publication in Asia. This is concentrating the limited human and economic resources on pursuit of knowledge where the rest of the world pays little attention, with high clinical relevance, and there is abundance of research materials. Asian neurology has rightly been given high priority in the *Neurological Journal of South East Asia* since the inception in 1996. The Journal should continue this editorial policy in the foreseeable future.

REFERENCES

1. Boongird P, Soranastaporn S, Menken M, Vejjajiva A. Spectrum of neurological disease in Thailand. *Neurol J Southeast Asia* 1996;1:65-7
2. Chong HT, Li PCK, Ong B, *et al*. Severe spinal cord involvement is a universal feature of Asians with multiple sclerosis: A joint Asian study. *Neurol J Southeast Asia* 2002;7:35-40.
3. McDonald WE, Compston A, Edan G, *et al*. Recommended diagnostic criteria for multiple sclerosis: Guidelines from the International Panel on the Diagnosis of Multiple Sclerosis. *Ann Neurol* 2001;50:121-7
4. Leung SY, Ng THK, Yuen ST, Lauder IJ, Ho FCS. Pattern of cerebral atherosclerosis in Hong Kong Chinese, severity in intracranial and extracranial vessels. *Stroke* 1993;24:779-86.
5. Liu HM, Tu YK, Yip PK, Su CT. Evaluation of intracranial and extracranial carotid steno-occlusive diseases in Taiwan Chinese patients with MR angiography, preliminary experience. *Stroke* 1996;27:650-3.
6. Wong KS, Huang YN, Gao S, Lam WW, Chan YL, Kay R. Intracranial stenosis in Chinese patients with acute stroke. *Neurology* 1998;50:812-3.
7. Wong KS, Gao S, Chan YL, *et al*. Mechanisms of acute cerebral infarctions in patients with middle cerebral artery stenosis: A diffusion-weighted imaging and microemboli monitoring study. *Ann Neurol* 2002;52:74-81.
8. Wong KS, Li H. Long-term mortality and recurrent stroke risk among Chinese stroke patients with

- predominant intracranial atherosclerosis. *Stroke* 2003;34:2361-6.
9. Wong KS, Huan Li, Chan YL, et al. Use of transcranial Doppler ultrasound to predict outcome in patients with intracranial large-artery occlusive disease. *Stroke* 2000;31:2641-7.
 10. Tan EK. Autosomal dominant spinocerebellar ataxias: An Asian perspective. *Neurol J Southeast Asia* 2002;7:1-8.
 11. Ng WK, Teh BT, Malmberg I, et al. Huntington's disease in Malaysia: a clinical and genetic disease. *Neurol J Southeast Asia* 1997;2:57-63.
 12. Gwee AL, Ransome GA. Neurological disorder in Singapore. In: Spillane JE, ed: Tropical neurology. London: Oxford University Press, 1973:283-98.
 13. Vejajiva A. Neurology in Thailand. In: Spillane JE, ed: Tropical neurology. London: Oxford University Press, 1973:335-52.
 14. Wang F, Wang CL, Tan CT, Manivasagar M. Systemic lupus erythematosus: a study of 539 patients and comparison of prevalence and disease expression in different racial and gender group. *Lupus* 1997;6:248-53.
 15. Chew NK, Sim BF, Tan CT, Goh KJ, Ramli N, Umapathi P. Delayed post-radiation bulbar palsy in nasopharyngeal carcinoma. *Neurology* 2001;57:529-31
 16. Parashar UD, Lye MS, Ong F, et al. Case-control study of risk factors for human infection with the new zoonotic paramyxovirus, Nipah virus, during a 1998-1999 outbreak of severe encephalitis in Malaysia. *J Infect Dis* 2000; 181:1755-9.
 17. Tan KS, Tan CT, Goh KJ. Epidemiological aspects of Nipah virus infection. *Neurol J Southeast Asia* 1999; 4:77-81.
 18. Chua KB, Koh CL, Hooi PS, et al. Isolation of Nipah virus from Malaysian flying-foxes. *Microbes Infect* 2002; 4:145-51
 19. Chua KB, Chua BH, Wang CW. Anthropogenic deforestation, El Nino and the emergence of Nipah virus in Malaysia. *Malaysian J Pathol* 2002;24:15-21.
 20. Spencer PS. Lathyrism. In: de Wolff FA, ed: Handbook of Clinical Neurology, Vol 21 (65). Intoxication of the Nervous System, Pt II. Elsevier Science B.V. 1995:1-20.
 21. Meinardi H, Scott RA, Reis R, Sander JW. The treatment gap in epilepsy. *Epilepsia* 2001;42:136-49.
 22. Wang WZ, Wu JZ, Wang DS, et al. The prevalence and treatment gap in epilepsy in China. *Neurology* 2003;60:1544-5.
 23. Lai CW, Huang XS, Lai YHC, Zhang ZQ, Liu GJ, Yang MZ. Survey of public awareness, understanding and attitudes toward epilepsy in Henan province, China. *Epilepsia* 1990;31:182-7.
 24. Alders EEA, Hentzen A, Tan CT. A community-based prevalence study on headache in Malaysia. *Headache* 1996;36:379-83
 25. Koh CW, Tan LP, Tan CT. A community based inter-cultural study on precipitating factors of headache. *Neurol J Southeast Asia* 2002;7:19-24.
 26. Cook GC (proposer), Warrell DA, Bryceson ADM (opposers). Debate: tropical medicine as a formal discipline is dead and should be buried. *Trans R Soc Trop Med Hyg* 1997;91:372-5.
 27. Keystone JS. Book review: Shakir RA, Newman PK, Poser CM, eds: Tropical neurology. *N Eng J Med* 1996;335:1075-6.