

## NEUROLOGICAL PATTERN IN SINGAPORE\*

By A. L. Gwee

(Medical Unit III, General Hospital, Singapore)

That diseases have a regional pattern was known even in the ancient times (1), and that environmental factors like climate and living habits and inborn factors like heredity and constitution have a profound effect upon the incidence and the progress of disease entities has been reported very frequently. However, it is only in the recent decade that geographical pathology has come into prominence. This knowledge is without doubt likely to have some important bearing on our understanding of the aetiology of some diseases. However, study of the disease pattern of a region is not only tedious, but also liable to many sources of errors. In the text-books so far, most of the incidence of diseases is based on figures of a clinic or a doctor, and it is insufficiently stressed that such figures cannot be easily compared, as they are dependent on factors other than regional ones. A doctor or a clinic may by its reputation or individual interest, exercise a selection of material, and selection bias may also be introduced by ephemeral factors like clinic appeal and economic or racial barriers. The ideal approach would of course be a nation-wide survey and registration of new cases, but here too we would be introducing observers errors and differences in a degree that can be serious. Alternatively, a collection of many observations at different centres of the same problem may give an idea of the homogeneity or otherwise of the population observed, leading to a more reliable estimate of the true incidence. Viewed in this light, many of the incidence figures in neurology or other disciplines are suspect, and have still to be tested for validity, and unless clinic incidence figures can be shown to be corrected in such a way as to bear a constant relationship to the population incidence figure, they cannot be used in making comparisons.

Singapore is fortunate in this aspect for many reasons. Firstly, it has a small population concentrated in a small area, so that no one can be more than 15 miles from another at any time. This will make survey a relatively simple and comparatively economic proposition. Secondly, 50% of the population is under the age of 16, and hence geriatric neurology where the patients frequently do not seek medical attention is

insignificant. Thirdly, from 1956 onwards till 1966, there exists a system of medicine far more comprehensive and liberal than any of the nationalised or socialised medicine known at present. The Government provided free medicine, inclusive of specialised services, hospitalisation, and outpatient care to anyone, aliens included, who demanded it without insurance premium or subscription. In addition, we also have a system of social aids which are meant to assist patients in the way of transport subsidies, sick benefits, so that utilisation of free medical facilities is made even more attractive. Needless to say, the cost has been found to be prohibitive, as demands for medical care, like the demand for a luxury, know no bounds; and hence from 1966, there has been some modification of policy. This period of grandeur, like the silver lining of a cloud, has been valuable however in enhancing the utilisation of Government facilities, and that in turn has been of great value in our attempt to assess population incidence of diseases. With no private hospital facilities to speak of in that period, the Government hospital admissions literally represented all the cases that would need hospitalisation. We have further checked this assumption against results of nationwide surveys of tuberculosis and cardiac diseases by miniature chest X-ray, and regional sampling of poliomyelitis and viral encephalitis by serologic typing of antibodies. These have shown that in Singapore, because of the lack of private competition, there is no clinic bias in that a case may prefer one clinic to the other. However, there is a marked racial and sexual bias, in that the Indian population is twice as ready to come to the hospital for the same complaint as the Chinese, and the Chinese in turn is twice as ready as the Malay, and that the male adult is twice as ready as the female adult, but in children under the age of 6, the readiness to seek hospitalisation is the same in both sexes. Moreover, there is also a disease bias such as for example only 10.7% of congenital heart disease have actually been on the loose without seeking medical attention, whereas for hypertensive heart disease and rheumatic heart disease, the figures are 18.2% and 38.5% correspondingly. (2).

\*Read at Second Asian and Oceanian Congress of Neurology 1967 in Melbourne.

Armed with these findings, it would seem, at least to us, that we are able to say with some certainty about our population incidence of some diseases, although we are planning, finance permitting, to have some nationwide surveys of a few entities such as epilepsy and cerebrovascular diseases so as to move from the realm of statistical calculation into that certainty on the basis of actual reckoning of total numbers.

For the moment, it would appear to us that in comparing neurological disease pattern in Singapore with that of countries where good figures are available, Singapore has now become a tropical country with no tropical disease, and has the ravages of all the neurological woes of temperate countries. There are however, certain distinctive exceptions which seem of interest, and will be now discussed.

Firstly, we have Amok, Latah and Koro. Amok is a term which has now crept into lay parlance, and is used widely to indicate a variety of conditions ranging from sudden violence to outright madness. It is typically characterised by the occurrence of a sudden furor and confusion in a man of varying ages, when he promptly attacks anyone within reach murderously with whatever weapon he might happen to be carrying, or to have found to be within reach. In his fury, several people might be seriously injured or killed, and soon (within an hour or so) fury-spent, he becomes docile, amnesic and meekly permits himself to be arrested. A number of them have been shot during the furor. When questioned after the event, a complete amnesia was found and the mental state showed no marked psychiatric disturbance in a good proportion of cases. Some however have been shown to be schizophrenic especially with paranoid tendency. This complaint is overwhelmingly a Malay one, although Chinese cases have also been reported. Gimlette pointed out that amok meant madness in Malay and that the general idea was to die fighting. Also the word "amok" was supposed to be a battle cry of Malay pirates, and that to run amok might be the Malay way of committing suicide: "Europeans commit suicide, Malays run amok."

In the recent years, the incidence has become rare. Aetiologically, it would appear to be a form of acute manic reaction resulting in a motive-less violence, but is distinct in that the manic activity is short-lived, and entirely murder-bent in cases that run true to type. It is also reminiscent of possession syndromes and trance-like states, but

again there is usually no experience of supernatural possession, or passivity. When schizophrenic, the behaviour is more bizarre, and may show itself by sudden aggression in words or deed after a period of brooding.

Latah is also an essentially Malay disease of the adult with a few Chinese cases and more in females than males. The phenomenon can be brought on by a sudden act, such as a tap on the shoulder or a shout, when the affected will straightway become confused, and emulate whatever action the tormentor is making. Again, this is short-lived and also followed by complete amnesia at recovery. Yap reported (3) that most of the cases are females and in one of his personal cases, he noted dementia. In an extensive review, he defined it as a specific reaction produced by sudden psychological shock in naive underdeveloped or poorly endowed personalities, and is characterised by disintegration of the mental organisation and the boundaries of the Ego, with impairment of volition as well as the power of attention; resulting in the exhibition of echo-reactions and automatic obedience, associated with a minimal degree of anxiety and attempts at self-defence which may express itself as coprolalia. Whilst accepting its close resemblance to hysteria, he preferred to regard it as a fright neurosis with minimal hysterical elaborations because of its relation to fear.

It is said to have many forms, from latah mulut which consists of the use of obscene language in a sudden outburst reminiscent of Gilles de Tourette syndrome, to gross coprolalia and echolalia, when the affected make compulsive movements and speech in imitation. Gimlette observed that it appeared to be a form of auto-hypnotism but in general, Malays consider it as a form of personal peculiarity rather than a disease.

Examining these two diseases, one is struck by some similarities. They both shared the features of suddenness of onset, helplessness of the affected, melodramatic exhibition, constancy of an abnormal behaviour, and a complete amnesia at recovery. There is, however, the sex difference, and also, whereas an amok is rarely reported to do so again—perhaps partly because he is either shot dead or incarcerated behind prison or hospital walls, a latah is episodic, and remains so for many years. Culturally, both forms seem to have some reference to the idea of supernatural possession, which is a common belief of Malays, Indians, and Chinese but strangely enough, the afflicted are practically all Malays. Even when Chinese are affected, they

are frequently those who have been in Malaya for a few generations and in fact dress and live and speak like Malays.

Then there is Koro, an affliction of the Chinese, but occasionally Malays. Affecting males only and usually the young adults, the patient is seized with a sudden quaint notion that his penis is retracting into his abdomen, and should this materialise, he would surely die. In his desperation, he employs every physical means at his disposal, manual or mechanical, to prevent this retraction, and frequently he is assisted by a horde of eager and well-intentioned relatives. Thus, strings have been attached for a miniature tug-of-war, clamps have been applied like a retentive shackle, and even pins have been known to be used to immobilise the elusive offending member! My own interest was roused when a boy patient of 8 was encountered and his experience led me to write up this entity as a culture-determined disease. This, however, is not a complaint peculiar to the Malaysian Peninsula, for it has been described in Southern China many years ago (4), and recently has also been reported in many other countries except the European ones. A point of interest is that Latah, Amok and Koro are all decreasing in incidence, and have in the last few years become quite uncommon.

The dramatic change in incidence in these three diseases, leaves me in no doubt that they are all allied to hysteria whose symptomatology as we know has an intense cultural basis, and hence a change in cultural outlook would modify its clinical picture or incidence. The recent dispute between Sir Francis Walshe and Dr. Elliot Slater (9, 10) may have left the question of hysteria unresolved, but whether it is an entity or not, common or rare, there seems no doubt that these conditions are hysterical.

On the organic side, for over 30 years, doctors interested in neurology in my country have noted the conspicuous absence of disseminated sclerosis. As we know it, it is a disease that when atypical, can be extremely difficult to diagnose, but it is inconceivable that continuing attention of doctors, many of whom have seen the disease in its minutiae before they came to Malaya, and the continuing search in necropsy for evidence which is usually striking and distinctive, should miss the disease. The conclusion seems inevitable that up till now disseminated sclerosis is unknown in Singapore's indigenous population. We do see a case now and again, but every one of these has been an imported case, and we do rarely entertain possibilities of such a diagnosis

in local cases from time to time, particularly when we come across cases with deficits of the cerebellar system and the spinal cord, but inevitably when such cases were followed up to the necropsy stage, they were found not to be disseminated sclerosis. I have personal knowledge of two such cases pursued to the bitter end, when they turned out to be neuromyelitis optica and posterolateral sclerosis respectively. Hence, it must seem that disseminated sclerosis as an entity is exceptionally rare, if not entirely absent in Singapore. Contrasting this observation with the finding that we have our share of encephalitis, encephalo-myelitis, and demyelinating diseases like neuromyelitis optica, primary lateral sclerosis, amyotrophic lateral sclerosis, and postero-lateral sclerosis, a more intensive comparison between Singapore and other countries of the various aetiological factors of disseminated sclerosis would seem worthwhile.

Cerebrovascular diseases, with us as with other more affluent nations, constitute a main cause of death. However, it is in the investigation of subarachnoid and cerebral haemorrhages, with and without hypertension, that we come across a distinct difference between our series and others', in that the incidence of aneurysm and arteriovenous malformations are much lower in our cases. This is entirely an arteriographic finding, and our procedure is to do the arteriogram after 14 days from the bleed. 95% of these have only a bilateral carotid angiogram, but in the last year, we have also performed vertebral studies as well, and are now embarking on some cases of panarteriogram via the aortic arch. We have found that aneurysm and arterio-venous malformations together constitute less than 10% of all cases of bleeding. This seems to be a remarkably low figure, and as the quality of our arteriograph is satisfactory, this may be a true finding of a low incidence. It is admitted that confining the arteriography to carotids only in the large proportion of cases, and delaying the investigation to as late as 14 days after the bleeding episode would tend to bias against demonstrating the aneurysm or arterio-venous malformation. Nevertheless, the difference in incidence is such a large one between our figures and those of other centres, that more thorough aetiological study of bleeding cases in Singapore would seem worthwhile, and we are at present planning projects to investigate further this problem locally.

It remains for me to refer to malignancies. Amongst them, the only one that has been a source of intrigue is nasopharyngeal cancer

which has a high incidence in Singapore, and literally confined to the Chinese. Anatomically, this tumor very commonly metastasises from the primary site to involve the base of skull, and characteristically produces intractable headaches and cranial nerve palsies. Most of the metastasis to the central nervous system remains in the extradural space along as a sheet, although very exceptionally, a deposit may be found intracerebrally or in the spinal cord. It is extremely radio-sensitive, but unfortunately, when the bone is invaded, irradiation produces only a brief period of improvement.

Brought into prominence in S.E. Asia first by Digby of Hong Kong (5) who found that it accounted for 27.2% of 419 cases of neoplasia, and subsequently by Mekie (6) from Singapore who quotes an incidence of 16.41% in 530 cases. Much of what was said remains applicable, and in the last one and a half decade, our observations in Singapore especially those of Shanmugaratnam (7 & 8) have confirmed most of the previous conclusions with figures which are acceptable statistically. Its predominance in Southern Chinese males, and its mode of intracranial spread have been confirmed, and the use of tissue culture technique has established firmly its origin from epithelial sources. Aetiological studies, mostly retrospective, in Singapore cases, have tended to lay to rest many speculations such as the eating of spicy food, the use of snuff, opium smoking, the inhalation of incense or smoke of a domestic origin, and the topical applications of traditional Chinese medicine. The strong racial preponderance would suggest a genetic factor, but so far our studies in Singa-

pore have produced no positive evidence to that end.

Thus, it can be seen that the comparison of neurological pattern of Singapore with that of other countries has shown some distinct differences, and in the pursuit of these differences, we may yet be given a clue to some of the aetiological factors of a number of neurological conditions.

#### ACKNOWLEDGEMENT

The kind permission for access to materials of Professor K. Shanmugaratnam, Professor of Pathology, University of Singapore, and Dr. Chia Kim Boon, Radiotherapist, General Hospital, Singapore.

#### REFERENCES

1. The Yellow Emperor's classic of Internal Medicine Translated by Ilza Veith, University of California Press, Berkeley and Los Angeles 1966.
2. Gwee A. L. (1964): Unpublished figures.
3. Yap P.M. (1952): "The Latah Reaction: Its Pathodynamics and Nosological Position", *Jour. Ment. Sci.* 98/413, 515-564.
4. Gwee A.L. (1963): "Koro—a cultural disease", *Sing. Med. J.* 4/3, 119-123.
5. Digby K. H., Fook W.L., Che Y.T., (1941): "Nasopharyngeal Carcinoma", *Brit. J. Surg.* 28, 517-537.
6. Meki D.E.C., (1949): "Lymphoepitheloma", *Mal. Med. Journal* 3/4, 236-245.
7. Shanmugaratnam K. (1965): Personal Communication.
8. Chia K.B. (1965): Personal Communication.
9. Slater E. (1965): Diagnosis of Hysteria. *Brit. Med. J.* 1, 1395-1399.
10. Sir Francis Walshe (1965): Diagnosis of Hysteria *Brit. Med. J.* 2, 1451-1454.