**LETTER TO THE EDITOR**

**Development of Clinical Neuropathology in China During the Past Half Century: A Publication Survey**

The beginning of Chinese neuropathology can be traced to the early years of the 20th century. In the 1920s to 1940s, a few neurologists from Beijing and Shanghai, such as Cheng Yu-lin, Hsu Yin-kuei, Huang Ke-wei, Zhang Yuan-chang, and Wang Wei-zeng, went to Europe and the United States for training in clinical neuropathology (1). When they returned to China, they became the pioneers of Chinese neuropathology. In 1938, Drs. Hsu Yin-kuei and Cheng Yu-lin published a landmark article on the neuropathology of carbon monoxide poisoning in the famous journal *Brain* (2). Clinical neuroscience was still under the umbrella of internal medicine in that period. In 1951, neurology and psychiatry were separated as independent subjects with the founding of the Chinese Neurology and Psychiatry Society. From then on, Chinese clinical neuroscience and neuropathology experienced a great development.

The important forum, Clinicopathological Conferences (CPCs) in Neurology, was imported to China in the 1950s. The most famous CPC in China was the Beijing CPC, which was formally established by Prof. Huang Ke-wei in 1978 and has continued since then for more than 30 years. The current manager is Prof. Wang Lu-ning. The Beijing CPC is held monthly on the second to last Wednesday afternoon at the Chinese PLA General Hospital. Two puzzling cases provided by the hospitals on a rotating basis are presented and discussed at every session. Moreover, hospitals in other provinces have also intermittently participated in the Beijing CPCs and have presented their cases. In 2008, the 30th anniversary was celebrated at the Chinese PLA General Hospital.

The *Chinese Journal of Neurology and Psychiatry (Chin J Neurol Psychiatry)* was founded in 1955 as the official journal of the Chinese Neurology and Psychiatry Society; it was split into the *Chinese Journal of Neurology (Chin J Neurol)* and *Chin J Psychiatry* in 1996. Most studies in China have been published in Chinese. *Chin J Neurol* and its predecessor are the main publishers of case reports from the CPCs; there is a special unit that publishes these reports on a timely basis.

To document the development of clinical neuropathology in China during the past half century, we searched PubMed (from 1966 to 2009), China National Knowledge Infrastructure (from 1979 to 2009), and Wanfang Data (from 1984 to 2009) using the terms “brain pathology,” “muscle pathology,” “neuropathology,” “autopsy,” and “biopsy” or their Chinese equivalents. In addition, all print issues of *Chin J Neurol* and *Chin J Neurol Psychiatry* from 1955 to 2009 in the Chinese PLA Library of Medicine, Peking Union Medical College Library, and Beijing Xuanwu Hospital Library were reviewed. There were no issues published from January 1960 to March 1963 or from July 1966 to June 1978 because of historical events.

We found 35 Chinese publications in English in PubMed; of these, 18 were case reports. We identified 1,496 Chinese publications from China National Knowledge Infrastructure and Wanfang Data. From 1955 to 2009, the total publications and neuropathologic publications in *Chin J Neurol* and *Chin J Neurol Psychiatry* were 5,914 and 905, respectively. Of the latter, 86 were from CPC case reports. The number of publications in the 1970s was the lowest because of closure of *Chin J Neurol Psychiatry* for most of that period. The percentage of neuropathologic publications in the 1960s was the highest (20.81%); the percentage in the 1990s was the lowest (11.58%). There was a significant difference in these periods ($\chi^2 = 7.977$, $p = 0.005$). The percentages of publications with autopsies were relatively high, that is, 69.23%, 55.34%, and 59.09% for the 1950s, 1960s, and 1970s, respectively. Beginning in the 1980s, this percentage began to fall; in the 2000s, it dropped to 18.77% ($\chi^2 = 87.684$, $p < 0.001$). We attribute this significant change to the wide application of modern neuroimaging technology and molecular biology.

Tumors were the most frequent subjects in the 1950s, 1960s, and 1980s; cerebrovascular disease publications were most numerous in the 1970s. In the 2 recent decades, the percentage of neuromuscular diseases publications increased to a large extent (Table). In general, tumors, cerebrovascular disease, infectious diseases, and demyelinating diseases have been important subjects of neuropathologic research in China. For example, the neurologic complications of infectious diseases, schistosomiasis and leptospirosis, were popular subjects in some areas of China from the late 1970s to the early 1980s; a noteworthy number of cases with “sporadic encephalitis” were clinically diagnosed in China during those periods. Follow-up of these cases showed that responses to treatment and prognosis were quite different. Therefore, Chinese neuropathologists paid close attention to these cases, and autopsy studies were conducted. Ultimately, cases of clinical “sporadic encephalitis” were clarified by pathologic analyses as herpes simplex virus encephalitis, acute disseminated encephalomyelitis, multiple sclerosis, and so on (3).

Representative reports in Chinese publications mainly were of Wilson disease (4), rabies (5), and amyotrophic lateral sclerosis (6) in the 1950s; multiple sclerosis (7), cerebral schistosomiasis (8) (Fig. 1A), and amaurotic family idiocy (9) in the 1960s; Mooyama disease (10), BalE sclerosis (11), acute disseminated encephalomyelitis (3), intravascular lymphoma (12) (Fig. 1B), and carcinomatous meningitis (13) in...
the 1980s; leptospira-related cerebral angiopathy (14), Machado-Joseph disease (15) (Fig. 1C, D), MELAS-type mitochondrial encephalomyopathy (16), and tomaculous neuropathy (17) (Fig. 1E) in the 1990s; and CADASIL (18), dementia with Lewy bodies (19), Huntington disease (20), heroin spongiform leukoencephalopathy (21), frontotemporal dementia (22), and dysembryoplastic neuroepithelial tumors (23) in the 2000s.

**CURRENT RESOURCES IN CHINA**

Based on our survey of publications, we conclude that case report is the most commonly used format in Chinese clinical neuropathology publications; case series reports are relatively rare. International trends in neuropathology indicate that brain banking is becoming more important with declines in autopsy cases, particularly for neurodegenerative diseases. At present, a few brain banks have been established in China, for example, the brain bank of neurodegenerative diseases at the Chinese PLA General Hospital. Low autopsy rates in China may hinder the development of brain banking, however. In the future, collaborative networks will probably be necessary for overcoming the difficulties of brain collection and analyses.

**TABLE.** Disease Categories in Neuropathologic Publications of the Chinese Journal of Neurology and Chinese Journal of Neurology and Psychiatry From the 1950s to 2000s

<table>
<thead>
<tr>
<th>Years</th>
<th>Cerebrovascular Diseases</th>
<th>Infectious Diseases</th>
<th>Tumors</th>
<th>Neurodegenerative Diseases</th>
<th>Demyelinating Diseases</th>
<th>Metabolic Diseases</th>
<th>Neuromuscular Diseases</th>
<th>Other Neurologic Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950s</td>
<td>2 (3)</td>
<td>17 (26)</td>
<td>23 (35)</td>
<td>2 (3)</td>
<td>3 (5)</td>
<td>9 (14)</td>
<td>5 (8)</td>
<td>4 (6)</td>
</tr>
<tr>
<td>1960s</td>
<td>20 (19)</td>
<td>22 (21)</td>
<td>29 (28)</td>
<td>4 (4)</td>
<td>5 (5)</td>
<td>7 (5)</td>
<td>7 (7)</td>
<td>11 (11)</td>
</tr>
<tr>
<td>1970s</td>
<td>7 (32)</td>
<td>1 (5)</td>
<td>5 (23)</td>
<td>—</td>
<td>3 (14)</td>
<td>2 (9)</td>
<td>—</td>
<td>4 (18)</td>
</tr>
<tr>
<td>1980s</td>
<td>28 (12)</td>
<td>37 (16)</td>
<td>80 (35)</td>
<td>5 (2)</td>
<td>5 (2)</td>
<td>4 (2)</td>
<td>33 (14)</td>
<td>38 (17)</td>
</tr>
<tr>
<td>1990s</td>
<td>15 (9)</td>
<td>26 (15)</td>
<td>16 (9)</td>
<td>19 (11)</td>
<td>17 (10)</td>
<td>13 (7)</td>
<td>43 (24)</td>
<td>27 (15)</td>
</tr>
<tr>
<td>2000s</td>
<td>39 (13)</td>
<td>35 (11)</td>
<td>36 (12)</td>
<td>24 (8)</td>
<td>12 (4)</td>
<td>15 (5)</td>
<td>86 (28)</td>
<td>62 (20)</td>
</tr>
<tr>
<td>Total</td>
<td>111 (12)</td>
<td>138 (15)</td>
<td>189 (21)</td>
<td>54 (6)</td>
<td>45 (5)</td>
<td>48 (5)</td>
<td>174 (19)</td>
<td>146 (16)</td>
</tr>
</tbody>
</table>

Values are presented as n (%).

n, number of publications.

Chinese neuropathology has always been practiced by neurologists or pathologists after specialized neuropathologic training. With a history of 3 decades, the CPC continues to be an important platform for education of young neuropathologists in China. There are also some special study classes regularly organized by certain hospitals, including a neuropathology class in Xuanwu Hospital and a muscle biopsy and pathology class in Peking University Hospital. Official associations, such as the Neuropathology Group in the Neurology Society of the Chinese Medical Association, have also organized academic meetings that provide chances for young neuropathologists to learn and communicate the field.

In conclusion, the start of neuropathology in China was relatively late but experienced a great development during the past half century. Although neuropathologic publications are just the tip of the iceberg for all the neurologic diseases, they reflect the development of Chinese clinical neuropathology.

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