Neurology

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Recent progress in the study of neurological diseases in Japan has been comprehensive and extensive. In this article, however, eight topics among many are reviewed.

Unique leukoencephalopathies with skeletodermatopathy

Two types of hereditary (autosomal-recessive) leukoencephalopathy unique to this region have been reported during the last two decades. One is 'membranous lipodystrophy', first described by Nasu et al. in 1973, which is clinically characterized by the onset of pain and pathological fractures in the extremities and progressive mental and intellectual deterioration. Recently, computed tomography or magnetic resonance imaging (MRI) has revealed atrophy or demyelination of the cerebral white matter [1, 2]. The other is 'familial young-adult-onset arteriosclerotic leukoencephalopathy (Binswanger type) associated with alopecia, lumbago and no hypertension', first described by Maeda et al. in 1965 and later referred to as a new syndrome by Fukutake et al. [3]. This syndrome has been reported only in Japan. The clinical characteristics are predominant in males, pyramidal-extra-pyramidal symptoms, pseudobulbar palsy, intellectual and mental impairments, and lack of vascular risk factors. Six cases showed demyelination with sparing of U-fibres, multiple small foci of perivascular softening in the cerebral white matter and severe arteriosclerosis on post mortem.

Neural mechanism of reading and writing in the Japanese language

The written Japanese language is unusual in having two distinct sets of characters, kanji and kana. Recently, neuropsychological studies have revealed that the processing of kanji and kana involves different intrahemispheric mechanisms. Lesions to the inferior temporal lobe have been shown to lead to alexia and agraphia specific to kanji [4]. Lesions of the left parietal lobe can produce selective agraphia for kana [5] and Japanese dyslexic subjects have been found to be able to read kanji, but not kana [6]. A patient with left unilateral agraphia for kana without apraxia having a lesion of the posterior body of the corpus callosum was reported [7], illustrating the possibility that there are different interhemispheric pathways for these two writing systems.

Multiple sclerosis (MS)

MRI of the brain and spinal cord has proven to be the most sensitive method for detecting the asymptomatic demyelinated lesions of MS [8]. The combination of Gd-DTPA and T2-weighted MRIs could distinguish between oedema and demyelinated lesions, and was much more sensitive than clinical examination in detecting disease activities [9]. Unmasking subclinical demyelinated lesions by intravenous administration of lidocaine should be useful also [10]. The usefulness of multimodal evoked potentials (MEPs) for detecting the lesions was assessed, and at least one of the MEPs was abnormal in 80% of the patients with clinically definite MS [11].

Nationwide survey of spinocerebellar degeneration (SCD)

A nationwide survey was performed during the period 1988 to 1991 by the Research Committee on Spinocerebellar Degeneration of The Japanese Ministry of Welfare and Health [12]. It consisted of three parts. The first postal survey estimated that the total number of patients with SCD in Japan was 5050 and the prevalence was 4.53 in 100,000. The second survey clarified the neurological and functional status of patients with SCD and showed a higher proportion of non-hereditary types of SCD in Japan, which is in contrast to a study in Europe, where hereditary SCD is predominant. The third,
three-year follow-up, survey revealed a death rate of about 10%.

**Dentato-rubro-pallido-luysian atrophy (DRPLA)**

DRPLA, named by Smith in 1975, is a SCD characterized by combined system degeneration of the cerebellar efferent system and the extrapyramidal pallido-luysian system. Cases of this disease have been reported mainly in Japan, and were classified into three clinical forms [13]: ataxo-choreoathetoid, pseudo-Huntington and myoclonus epilepsy. Japanese cases of Machado–Joseph’s disease show clinical features very similar to those of the ataxo-choreoathetoid form [14]. In the pseudo-Huntington and myoclonus epilepsy forms, diffuse high-signal areas in T₂-weighted MRI are often observed in the white matter responsible for dementia [15]. An extensive review on DRPLA has been published [16].

**Juvenile muscular atrophy of the distal upper limb (Hirayama’s disease)**

This disease occurs in young persons, mainly in males in their late teens. The main clinical features include predominantly unilateral weakness and atrophy of the hand and forearm, and the clinical course turns non-progressive after some years of progression. In Japan, the first cases were reported in 1959 and many clinical cases have been described. This disease now appears in a chapter of the diseases of the motor system in the *Handbook of Clinical Neurology* [17] and was presented as the presidential lecture at the National Congress of Neurology of Japan in 1993. The lesions of this disease were limited in the anterior horn, mainly at the 7th and 8th cervical cord, and some circulatory insufficiency in the spinal cord was suggested [18]. Neuro-radiological studies show that the posterior wall of the lower cervical dural canal with the cord moves forward when the neck is flexed. By this displacement, the spinal cord is compressed antero-posteriorly mainly at C7 and C8 segments [19]. MRI shows the lower cervical posterior epidural space as a high intensity area in T₂- and T₂-weighted phase. In the progressive stage, electrophysiological studies reveal active denervation and reinnervation of the affected muscles showing damage to the anterior horn cells, while in the non-progressive stage there is only inactive reinnervation. A conservative cervical collar therapy preventing neck flexion is effective [20].

**Human T-cell lymphotropic virus type I (HTLV-I)-associated myelopathy**

A close association between HTLV-1 infection and chronic progressive spastic paraesthesia was reported in Japan [21]. Characteristic neurological features are a slowly progressive course, prominent pyramidal tract signs and mild sensory and sphincteric disturbance. Females are more affected than male, with an age of onset from 6 to 75 years. A subgroup related to previous history of blood transfusion (2 years after). Another early-age subgroup was believed to be transmitted vertically from mother to child. The essential pathological features are a chronic inflammatory process in the lower thoracic cord with marked parenchymal exudation of leucocytes [22]. Various therapies with erythromycin [23], salazosulphapyridine, interferon-α, plasma exchange and high-dose immunoglobulin [24] are on trial.

**Acute pandysautonomia (AP) and Shy–Drager syndrome (SDS)**

Clinical features of patients with AP were analysed by a survey of the Research Committee on Peripheral Neuropathies in Japan [25]. The median duration between the appearance of prodromal symptoms and the first autonomic symptoms (urinary disturbances or abdominal symptoms) was 4.5 days and that of the peak period from the onset was 18 days. Sweat disturbances, orthostatic hypotension and areflexia did not recover well and sural nerve biopsy revealed poor restoration of myelinated fibres in the recovery period [26]. Sera from patients with AP showed higher neurite-promoting effects on autonomic ganglionic neurons of cultured embryonic chick than sera from healthy subjects [27]. The results suggest that patients with AP have increased activity in the recovery of the autonomic neurons. Plasmapheresis was reported to be effective in a patient with AP [28]. The above-mentioned nationwide epidemiological study of SCD estimated total number of patients with Shy–Drager syndrome in Japan was about 350, 7% of SCD, and prevalence of 0.31 in 100,000 [12]. Functional prognosis of Shy–Drager syndrome was the poorest in SCD and about half of the patients with Shy–Drager syndrome found it impossible to walk independently within about 6 years. High-field strength MRI showed the narrow width of the pars compacta signal in SDS, indicating degeneration of the substantia nigra [29].

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References


