

# Traditional Chinese Herbs in Treatment of Neurological and Neurosurgical Disorders

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## EDITOR'S NOTE

*With the rapid increase in communication and exchange of ideas between China and North America during the past decade, there has been considerable interest amongst Western physicians in traditional Chinese medicine and the use of herbal preparations for a variety of medical problems. The exact chemical constituents of many of these preparations are still unknown and few of the treatments have been tested in rigorous controlled clinical trials. Nevertheless it was considered timely to present a review of the use of herbal medicines in certain neurological problems, and Drs. Ding and He were invited to prepare this special feature for the CJNS. Drs. Ding and He are presently both working as visiting scientists in North America — Dr. Ding in the Department of Clinical Neurosciences at University of Calgary and Dr. He in the Department of Neurology at University of Wisconsin.*

Traditional Chinese medicine and herbs have been widely used for at least 3,000 years. During this time there has been a rich accumulation of experience using herbal medication to treat a variety of diseases. Numerous books were written by ancient Chinese physicians and they are still in use today. Since 1949, the further development of Chinese medicine has been encouraged and in some areas important contributions to the health care of the Chinese people have resulted from combining traditional Chinese and Western medicine.

Since effective treatments are still not available for many neurological disorders, there has been a natural tendency to attempt treatment of some of these conditions with traditional herbal medicine. This article will briefly review some of the experience gained from using Chinese herbs in the fields of neurology and neurosurgery.

## Principle for writing an herbal prescription

The theory of Chinese medicine is completely different from that of Western medicine. To write out an herbal prescription of traditional medicine is not simply a matter of combining some Chinese herbs. One must prescribe according to the theory of Chinese medicine using the old "Ying-yang and five-element

theory". Using the four methods of diagnosis (observation, auscultation, interrogation and palpation of the pulse) and eight-principle syndromes, a clinical diagnosis is made, and an appropriate group of herbs is selected. These special groups of herbs were made up thousands of years ago by famous physicians and continue to be used. A special name is given to each of these herbal groups. For example, in cases of pituitary adenoma complicated with weakness, pallor, low body temperature, aversion to cold, and impotence, the symptoms and signs are considered as "Deficiency of Yang (vital function) of the kidney", hence a special concoction named "Chinkui Shenchi Tang" is often used as the chief medicine. The patient with symptoms of lumbago, tinnitus, nocturnal emission, thirst and impotence is considered to have "Deficiency of Ying (vital essence) of the kidney" and another special concoction named "Liuwei Tihang Tang" is used.

The characteristics and functions of Chinese herbs were described in the book "Compendium of Materia Medica" which was written by Li Shi-Zhen (1518-1593 A.D.) over a period of thirty years, and is the earliest Pharmacopeia in the world.

## Cerebrovascular Disease

The first recorded incidence of cerebrovascular disease (CVD) was in China. According to an epidemiological survey among 350,000 residents in Beijing, 1.22% of residents died of CVD, while 0.22% died of myocardial infarct; CVD is the leading cause of death. In the past ten years, the incidence of cerebral thrombosis has become higher than that of arterial hypertensive cerebral hemorrhage, as is the case in Western countries.

Based on the theory of traditional Chinese medicine, there are eight ways to treat a patient suffering from CVD: (1) 'open the aperture of the heart blocked by pathogenic factors' (return to consciousness from coma); (2) 'consolidate the vital energy' (prevent the patient from prostration); (3) 'remove the noxious factors' (treat the patient with the pathogenic factors); (4) 'to maintain the vital energy' (supportive treatment); (5) 'cure the mental state' and (6) 'stimulate the Shu points' (with moxibustion);

(7) 'cure the paralysis of extremities' (8) 'treat the fever'. The stage of illness determines which of the above methods would be used. 'Promoting blood circulation and eliminating stasis' is also generally recognized as effective treatment.

In an acute stage of cerebral hemorrhage, the principal treatment is to 'open the aperture of the heart blocked by pathogenic factors', a Chinese method of resuscitation. The main purpose of treatment is to regain consciousness from coma. The pill 'An Gong Niu Huang Wan' or 'Su He Xiang Wan (Storax)' is often used. As we know, there are still arguments about their effects. We have done experimental work to investigate the effect of 'An Gong Niu Huang Wan'.<sup>4</sup> Two groups of 10 rats each were put into an hypoxic environment (5% oxygen and 95% nitrogen). The experimental group was treated with 'An Gong Niu Huang' injection intravenously, and the average survival time was 86.9 minutes. The control group was treated with normal saline intravenously and the average survival time was 47.3 minutes. The statistical difference between the two groups is significant ( $P$  value  $> 0.05$ ). It was found that in the hypoxic environment, the rats in the experimental group not only lived longer but also moved more actively than those in the control group. This led us to believe that 'An Gong Niu Huang Wan' has a protective effect on the brain from hypoxemia. In the convalescent stage, the pills 'Ginseng ZaiZao Wan' and 'Huo Luo Dan' are used to promote recovery from aphasia and hemiplegia.

Chinese ways of rehabilitation such as massotherapy and acupuncture are often recommended as early as possible. It was reported that 283 cases of CVD were treated with acupuncture twice a day in a period of less than 6 months. Eighty-four percent of the cases with various degrees of hemiplegia/aphasia improved with acupuncture.<sup>2</sup> In cases complicated by gastrointestinal hemorrhage after cerebral stroke, an herbal powder named 'Yun Nan Bai Yao' may be used to control the hemorrhage by way of a feeding catheter. A distinct coagulative effect follows. In an experimental investigation on the coagulative effect of 'Yun Nan Bai Yao' Du Yan-Chong (1982)<sup>5</sup> thought that the action of this herbal powder is possibly due to promoting the release of platelets and healing the wound.

In acute stages of cerebral thrombosis, the principle of treatment based on the theory of Chinese medicine is 'to invigorate the blood circulation and resolve the stasis'. The herbal compound concoction 'Bu Yang Huan Wu Tang' is often used. An experimental observation on the effect of 'Bu Yang Huan Wu Tang' showed a dominant inhibitory effect on aggregation of blood platelets.<sup>6</sup> Another herbal compound concoction named 'Tong Mai Tang' had been used to treat cerebral thrombosis. The main effect is that it improves the viscosity of blood, thereby improving the microcirculation of the brain. A group of 152 cases of acute cerebral thrombosis was treated with 'Bu Yang Huan Wu Tang' over a period of 3 months. Eighty-eight percent of cases with hemiplegia were improved, among them 40% recovered completely.<sup>7</sup> Another group of 107 cases of acute cerebral thrombosis was treated with 'Tong Mai Tang'. All cases showed various degrees of hemiplegia before treatment, after a period of 2 to 3 months on medication, 44.9% of them had recovered completely while 37.4% were markedly improved.<sup>3</sup>

There was also some experimental work on some herbs such as 'Rhizoma Ligustici Chuanxiong', 'Radix Salviae Miltiorrhizae' and 'Flos Carthami'. An alkaloid 'Tetramethylpyrazine' was extracted from 'Rhizoma Ligustici Chuanxiong' and pharmacological observation showed an antispasmodic effect on smooth

muscle of blood vessels. By electron microscopic examination, 'Chuanxiong' also showed a depolymerization on coactivated blood platelets, therefore the cerebral blood flow (CBF) was increased. Pharmacological observation on the effect of 'Radix Salviae miltiorrhizae' revealed that 'miltiorrhizae' plays a role as a vasodilator and reduces blood viscosity, thereby increasing the CBF. In some cases, where patients suffered from idiopathic pain of the extremities after stroke, stereotactic thalamotomy was recommended. If the patient declines this surgical procedure, tablets or injections made of 'Fructus chaenomelis indicis' are often used to control pain with good results. Special pills of 'Ginseng ZaiZao Wan' and 'Huo Luo Dan' are also commonly used. Massotherapy and acupuncture to proper acupoints, such as Niéguan (PC6), Quchi (IC11), Hegu (IC4), Jianyu (IC15) and Waiguan (SJ5) (upper extremities) and Jinmen (VU63), Zusanli (V36), Weizhong (VU40) and Huantiao (VF30) (lower extremities) are often recommended as a Chinese way of rehabilitation.<sup>1,8</sup>

In acute stages of CVD, respiratory tract infections such as bronchitis and pneumonia are common complications. In order to control the inflammatory process, the herbs with antipyretic and detoxicant effects are used according to the theory of Chinese medicine, except where antibiotic therapy is required. 'Flos Lonicerae', 'Radix Scutallariae', 'Herba Taraxaci', 'Antelopsis Cornu' and other herbs all show a wide antimicrobial spectrum without side effects. In cases of hypersensitivity reaction to penicillin and other antibiotics, these herbs may play an important role in controlling infections.

#### Intracranial Tumours

The experimental and clinical trials on antitumour qualities of Chinese herbs have been investigated widely. Many kinds of herbs were used to control the somatic malignant tumours, such as cancer of lungs, stomach, liver, as well as leukemia and metastatic cancer. Until now, only a few results were reported concerning the effect of herbs on intracranial tumours. However, since these results were clinical observations only and no experimental investigation has been done, further study is needed.

A Methylcholanthrene-induced glioblastoma model in rats was used in our laboratory last year to investigate the antitumour effects of herbs. The herbs (XH-84) were injected directly into the tumour of a group of rats. Twelve hours after local injection of XH-84, the size of the tumours began to diminish and 24 hours later the tumours had vanished entirely. Electron microscopic observation showed that the structure of the tumour cells dissolved. After 4 weeks of observation, the tumours had not recurred while in the control group the tumours were growing rapidly.<sup>9</sup> Such a preliminary observation led us to believe that some of the Chinese herbs might play an important role in controlling the experimental glioma. In our opinion the effect of herbs on cerebral glioma (astrocytomas and glioblastoma) deserve further clinical investigation.

Apart from the cerebral gliomas of the brain, 4 patients with pituitary chromophobe adenoma were treated with Chinese herb concoctions. After 2-10 years follow-up, one patient was cured, two patients improved markedly and one patient was improved clinically. In all 4 patients the headache had disappeared, vision improved and visual fields became normal or improved while plain skull roentgenograms remained unchanged.<sup>10</sup>

Today, Chinese herbs are used mainly as a supplementary approach combined with chemotherapy and radiation therapy for patients with malignant brain tumours, such as metastatic

carcinomas, glioblastoma multiforme, and medulloblastoma. Some kinds of herbs such as 'Rhizoma polygonati', 'roots of Astragalus', 'Caulis spatholobi', 'roots of Codonopsis' and 'Jinseng' all appear to have beneficial effects on strengthening patients' resistance and immunological state. Although the antitumour effect of Chinese herbs has been investigated widely both clinically and experimentally, further studies on its effects and mechanisms of action on intracranial tumours should be carried out.

Acupuncture anaesthesia for craniotomies was begun in 1965 in our hospital. Over 2,000 cases of brain tumour in various structures of the brain have been removed under acupuncture anaesthesia. Of these, 84% had excellent and good results. Frontal, occipital and suboccipital (unilateral) regions of the brain are the primary surgical sites amenable to acupuncture anaesthesia.

### Epilepsy

Epilepsy is another common disorder in China. Although many new antiepileptic drugs have been developed in the past 12 years, there are still 20 to 30% of patients who are intractable or difficult to control.

According to the old theory of Chinese medicine, the causes of epilepsy or convulsions were thought to be an 'abnormality of the liver'. The principle of treatment more commonly used is to subdue the 'endogenous wind', such as 'Scorpion', 'Centipede', 'Antelope's horn', 'Bombyx batryticatus', 'Rhizoma gastrodii' and 'Uncaria rhynchophylla'. The tablet 'Kang Jian Ling' is made from 'Pepper' and '718' is made from 'Bombyx batryticatus'. Their anticonvulsant effect rate ranged from 60-70% without side-effects. In 32 patients with generalized major motor seizures 'Qingyangsen (roots)' were used to control the convulsions. Despite adequate treatment with other kinds of antiepileptic drugs, each patient suffered a seizure at least 4 times a month before medication of Qingyangsen. After a course of 2-9 months treatment, seizures were controlled in 9 patients, none of them suffering side-effects. Experimental investigation on 'Qingyangsen' by means of 'kindling test' in kindled rats also showed that 'Qingyangsen' had an antiepileptic effect on the animals.<sup>11</sup> Based on the clinical observation, we believe the herbs exert an anticonvulsant effect, but control of epileptic attacks using herbs alone still requires further study. At the moment, it seems that Chinese herbs can only be used as adjuncts to improve the effect of other antiepileptic drugs.

### Brain Injuries

Patients suffering from brain concussion, brain contusion and traumatic intracranial hematomas might be left with a post-traumatic syndrome with symptoms such as headache or dizziness. According to the theory of Chinese medicine, the post-traumatic syndrome should be divided in several types. For instance: 'insomnia, restlessness, palpitation, nocturnal emission' are thought to be the first type of 'breakdown of the normal physiological coordination between the heart and kidney'. The second type is 'Deficiency of functional activities and blood control of heart and spleen', giving rise to such symptoms as palpitation, forgetfulness, loss of appetite, abdominal distension and lassitude. The third type is 'Stasis of blood', resulting in frequent complaint of headache (migraine type). Prescribed forms of herbs should be based on the type of syndrome.

In cases with brainstem injuries remaining in a comatose state, 'An Gong Niu Huang Wan' and 'Su He Xiang Wan' are used for resuscitation. Acupuncture also plays an important role in resuscitation and functional brain recovery.

### Neurosis and Hysteria

Neurosis and hysteria are common disorders. Patients suffering with neurosis often complain of headache, tinnitus, insomnia, blurred vision and are easy to excite. These symptoms can be treated with many groups of herbs that are prescribed by Chinese physicians and the results are different. Generally, the symptoms of neurosis can be improved with 'Chinese Gentian' (radix Gentiane), 'Di Huang Wan' and many groups of herbs decocted, for instance, 'Gui Pi Tang' for the patient's loss of memory; 'Shen Qi Wan' or 'Herba Epimedii' for loss of libido or impotence; 'Chuanquong Chatiao San' for headache; 'Seed of Ziziphus Spinosa' for insomnia and so on. As a rule, the herbs are used in compounds or mixtures.

### Headache

Some types of headache, such as vasogenic (migraine) and tension headache, can be controlled with the herbal compound concocted 'Chuan Qiong Cha Tiao San'. This group of herbs is often prescribed to drink when mixed with tea. In 100 cases of vasogenic headache treated with 'Chuan Qiong Cha Tiao San', 86% improved and 25.6% were cured.<sup>14</sup> An injection of 'Rhizoma Gastrodiae' was administered into acupoints to control the vasogenic headache. Among 35 cases, in 57.1% the headaches ceased and in 22.7% the headaches improved markedly.<sup>12</sup> Another herbal compound concocted is 'Yang Jiao Chong Ji' (medical granules). Fifty percent of cases with vasogenic and tension headache were improved after medication in a period of 1 - 4 weeks.<sup>13</sup> Migraine is also treated with another group of herbs including 'Concha haliotidis', 'Rhizoma Ligustici', 'Radix Angeliae dahuricae' and 'Herba Asari'. After 2 weeks of medication and 3 months follow-up among 100 patients, 53% were cured, 46% were improved and 1% had failed.<sup>13</sup> Acupuncture was also used once a day in 100 cases with vasogenic headache, after 3-20 courses of treatment, 72% were cured, 25% had improved and 3% were without any effect.<sup>13</sup>

### Disorders of Cranial and Spinal Nerves

Facial palsy (Bell's), facial tic and trigeminal neuralgia are three of the more common cranial nerve disorders in adults or elderly patients. Though much treatment has been used, clinically the results are not satisfactory. A series of 1,000 cases with primary trigeminal neuralgia received treatment with acupuncture on alternate days over a period of 10 days to 3 months. In 54% of the cases, the pain was relieved within 3 months and in 29% of cases the pain improved markedly. Unfortunately, long-term follow-up studies (among 540 cases) showed the recurrent rate of pain within 5 years was as high as 39.4% of overall cases (Li Shi-Ming, *personal communication*). For this reason another treatment of trigeminal neuralgia was developed combining acupuncture with acupoint injections of herbs. With injections made of 'Fructus chaenomalis', both experimental and clinical observations demonstrated that 'Fructus chaenomalis' can raise the threshold of pain. Bell's paralysis in the acute stage can also be cured by acupuncture therapy. In a group of 46 cases of Bell's paralysis in acute and subacute stage, except 4 cases of sequelae, acupuncture was performed

once every other day. After 14 sessions of treatment, 30 cases were cured, 9 cases improved markedly, 4 cases showed moderate improvement, and 3 cases failed, the net effective rate was 93.4%.<sup>18</sup> Another method for facial paralysis is point injections of herbs. An injection made of 'Dong Gii (Radix angelicae)' was administered into points once a day. After 2-4 weeks treatment, 90% of cases were improved.<sup>18</sup> One interesting observation is that 70-80% of facial tic cases could also be improved by means of the same therapy which had been used in cases of facial paralysis. It is considered as the 'adjustment of herbs and acupuncture'.

Radiculities of peripheral nerves such as Guillain-Barré syndrome, sciatic and radiculitis of spinal nerves are not uncommon. Better results are achieved in Guillain-Barré syndrome when dexamethasone is combined with herbs. Acupuncture and massotherapy also plays an important role in improving some sequelae such as paralysis, hypalgesia and hyperaesthesia, the effective rate ranging from 60-90%. Acupuncture alone or combined with injected herbs into acupoints are often used for sciatica with better results. A group of 106 cases of sciatica were treated with acupuncture once a day. After 3-50 sessions of treatment, 50% of cases were cured and 33% were markedly improved.<sup>15</sup> Another group of 318 cases with sciatica were treated with acupuncture in the same way: of these 78% were cured and 10% markedly improved.<sup>16</sup> Acupoint injections of herbs were performed once a day combined with acupuncture to treat sciatica in 118 cases (including 63 cases primary and 55 cases secondary). After an average of 8 weeks treatment, 42.5% were cured, 35.5% markedly improved and 21.1% moderately improved.<sup>17</sup>

#### Encephalitis and Encephalopathy

Viral encephalitis in the acute stage can often cause high fever, loss of consciousness, convulsions and the risk of brain herniation from cerebral edema. From the point of view of Chinese medicine, the principle of treatment is 'to clear up and remove the evil heat with febrifugal drugs' and 'open the aperture of the heart with aromatic drugs'. The pill 'An Gong Nui Huang Wan' is often relied on as the main drug helpful in improving the clinical condition. The herbal compound concocted according to the clinical manifestation also plays an important role in controlling convulsions, lowering the temperature, and recovery from the unconscious state. In the convalescent stage, tonifying therapy is used to replenish vital energy and strengthen body resistance. A Chinese method of rehabilitation such as massotherapy and acupuncture has been demonstrated to be very useful and effective in improving the quality of speech, motor function and mental disturbances. Though the Chinese herbs are useful, it is best to combine Chinese herbs with popular clinical therapy.

In recent years Chinese neurologists have paid more attention to amentia of children (mental retardation) along with the

'one-child family' policy. Amentia may be caused by congenital factors or be secondary to various brain insults such as perinatal asphyxia. We had prescribed a group of herbs 'Yi Nao Wan' (pills) to a group of 378 cases of amentia of children caused by diverse etiologies. After 6-12 months of treatment, their mental state and intelligence testing had improved in 40% of the cases and a few went to school and obtained a job. Motor disturbance also recovered or improved. The Chinese physician thought 'Yi Nao Wan' possibly plays a role in improving brain function through adjustment of cerebral metabolism.<sup>19</sup>

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