

Original Articles

A Clinical Study of Oriental Medical Treatment on a Patient with Polyneuropathy

Seo-Young Hong, Hyun-Chol Cho, Yeung-Kee Kim, Seong-No Lee¹⁾, Hyung-Ho Lim

Department of Oriental Rehabilitation Medicine, College of Oriental Medicine, Kyungwon University,
Department of Acupuncture & Moxibustion, College of Oriental Medicine, Kyungwon University¹⁾

Objectives : Polyneuropathies are diseases of multiple peripheral nerves. They are usually characterized by symmetrical, bilateral distal motor and sensory impairment with a graded increase in severity distally. It is generally regarded that the natural courses are poor, so we wanted to study the effects of Oriental medical treatment on a patient with polyneuropathy.

Methods : We treated by conservative Oriental medical treatment a woman of 68 years who was diagnosed as a polyneuropathy and was hospitalized at Seoul Oriental Hospital, Kyungwon University, from 12th Mar. to 31st May, 2003. Changes of functional disability were checked by Amyotrophic Lateral Sclerosis Functional Rating Scale (ALSFRS), muscle atrophy was checked by measuring circumference of the thighs, calves, arms, and sensory impairment was checked by a sensory test.

Results :

1. Functional disability caused by motor impairment was reduced after the Oriental medical treatment
2. Muscle atrophy was reduced after the Oriental medical treatment
3. Sensory impairment was reduced after the Oriental medical treatment

Conclusion : We treated a patient who was diagnosed with polyneuropathy for over 80 days and recorded good effects of Oriental medical treatment on polyneuropathy. (*Korean J of Oriental Med* 2003;24(4):139-148)

Key Words: Wijeung (痿症), motor impairment, sensory impairment, muscle atrophy, case report

Introduction

Polyneuropathy is also called peripheral neuropathy. There are many causes of polyneuropathy. Common causes are toxins, denutrition, metabolic disorder and so on.

It is usually characterized by symmetrical, bilateral distal motor and sensory impairment with a graded

increase in severity distally. The clinical symptoms of polyneuropathy include sensory impairment in both upper and lower extremities, muscle weakness and atrophy, foot drop, skin coldness and drying¹⁾. It can be called Wijeung (痿症) in Oriental medicine. The symptoms of Wijeung (痿症) are also muscle weakness, disability in gripping and walking, muscle atrophy and others^{1,2)}.

There are hundreds of different types of neuropathies and many different ways to categorize them, including by the type of nerve damaged, the causes of the nerve damage, or the pattern of nerve damage³⁾. It is generally regarded that the natural courses are very poor as there

Received 23 June 2003; revised 28 September 2003; accepted 12 October 2003

Correspondence to: Seo-Young Hong, Department of Oriental Rehabilitation Medicine, Seoul Oriental Hospital Kyungwon University, 20-8 Songpa-Dong, Songpa-Gu, Seoul, Korea; Tel: 82-2-425-3456, Fax: 82-2-425-3560, E-mail: hongseoyoung@netian.com

are abundant histologic and electrophysiologic evidences of axonal destruction⁹.

In this study, we treated a patient who was diagnosed as a polyneuropathy through a Magnetic Resonance Imaging (MRI), Electromyography (EMG) and nerve biopsy at ○ ○ hospital with a form of Oriental medicine and achieved good results.

Case

1. Name and Age

Kim ○ ○ (female, 68)

2. Chief Complaint

Weakness, numbness and pain on both upper and lower extremities, shoulder, cervical and low back pain

3. Onset

The first onset was Oct. 2000, and it worsened again after Jan. 2003.

4. Family History

Father: cardiac arrest

5. Past History

1) Diagnosed with hypertension and started medication in Apr. 2001.

2) Diagnosed with hysteromyoma and Bilateral Salping-Oophorectomy (BSO) & Total Abdominal Hysterectomy (TAH) were performed in Sep. 2001.

6. Present Illness

This 68-year-old female patient was overweight and the character was urgent. She had the past history described above and she had had some weakness in her arms and legs, numbness in her fingers and toes from Oct. 2000. She visited ○ ○ hospital at 2001 and learned through brain and lumbar MRI that her brain was normal but she had spinal stenosis on her lumbar spine. After treatment at that hospital she had some improvement, but it turned worse again thereafter, so she visited another hospital. There, she was diagnosed

with spinal stenosis and polyneuropathy through MRI and EMG. Then she was transferred to ○ ○ hospital to confirm her diagnosis. Finally, she was diagnosed with polyneuropathy with axonal degeneration through nerve biopsy and was hospitalized.

Again, she had some improvement, but worsened again in Jan. 2003, such that she couldn't walk or stand any more. At that time she wanted to be treated with Oriental medicine, so she was hospitalized at Seoul Oriental Hospital, Kyungwon University, from 12th Mar. to 31st May, 2003.

7. Investigations

1) Physical Examination on first day in hospital

Straight leg raising (SLR) test: (70° / 70°)(-/-)

Dorsi flexion: (+/) (normal: ++)

Plantar flexion: (+/) (normal: ++)

Deep tendon reflex (DTR): knee jerk (+/), elbow jerk (+/+) (normal: ++)

Sensory test: numbness & pain on both upper & lower extremities

Motor power: quadriparesis (Gr. IV, gait: can't)

Bulk: diffuse atrophy

2) Laboratory Tests

· Performed 13th Mar., 2003

Complete blood count (CBC): WBC 12.5×10^3 , others were not remarkable

Biochemistry (BC): γ -GTP 72mg/dl, others were not remarkable

Urine analysis (UA): normal

Serology (S): normal

· Performed 23rd Apr., 2003

CBC: WBC 10.1×10^3 , others were not remarkable

BC: γ -GTP 49mg/dl, others were not remarkable

· Performed 29th May, 2003

There were no remarkable results in CBC, BC, UA and S

3) Spinal Imaging (Fig. 1-3)

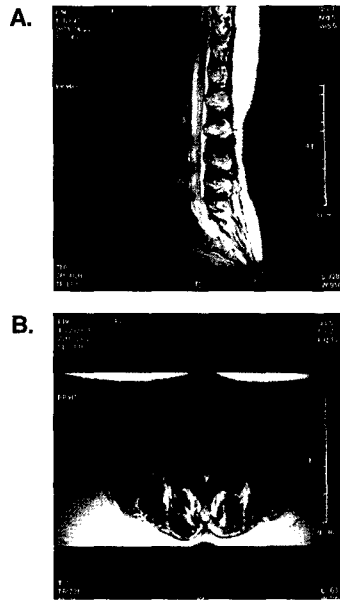


Fig. 1. MRI of lumbar spine, performed 28th Apr., 2001.
 A. Sagittal view.
 B. Transverse view, L4-5
 Mild degree central spinal stenosis in L2-3, 3-4 and L4-5 by the bulging discs and hypertrophy of ligamentum flavum. The stenosis is most prominent in L4-5.



Fig. 3. MRI of thoracic and lumbar spine, sagittal view, performed 24th Aug., 2001.
 Multiple spinal stenosis in T9-10, 10-11, L3-4, 4-5

4) EMG

Performed 29th Aug., 2001

Severe, central and peripheral conduction defects in both tibial nerves

Central and peripheral conduction defects in both median nerves

5) Nerve Biopsy

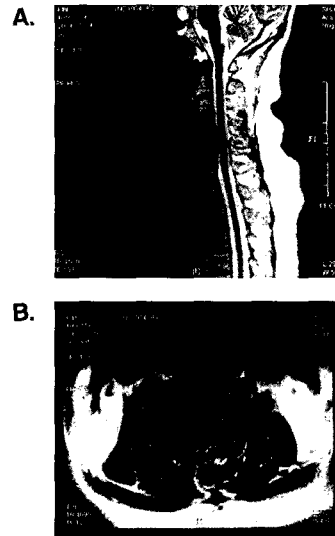


Fig. 2. MRI of cervical spine, performed 24th Aug., 2001.
 A. Sagittal view.
 B. Transverse view, C4-5
 Spinal stenosis in C4-5, 5-6

Performed 7th Sep., 2001

Axonal degeneration

8. Method of Treatment

We applied treatment consisting of herbal-medication, acupuncture, moxibustion, electroacupuncture, bee venom aqua-acupuncture, venesection and physical therapy.

1) Medication

We prescribed *BoYangHwanO-Tang* (*buyang-haiwu-tang*) from 12th Mar. to 9th May. This herbal-medicine is a prescription of Seoul Oriental Hospital, Kyungwon University and has had good effects on replenishment of qi and yang and promotion of the blood flow to remove blood stasis, so is used mainly for paralysis after stroke and muscle weakness.

After 9th May, we changed prescription to *CheongJo-Tang* (*qingzao-tang*). It is also a prescription of Seoul Oriental Hospital, Kyungwon University and has had good effects on removal of

damp-heat (濕熱). We usually use this prescription for muscle weakness and gait disturbance caused by damp-heat (濕熱).

We gave this herbal-medicine 3 times a day after meals. We didn't give any western-medicine except an anti-hypertension drug.

2) Acupuncture and Moxibustion Treatment

We performed acupuncture therapy on large intestine meridian (LI) and stomach meridian (ST) such as LI4 (合谷), LI11 (曲池), LI15 (肩髃), ST36 (足三里) and EX-B2 (華佗夾脊穴). Also we stimulated the trigger points of trapezius, levator scapulae, quadratus lumborum, erector spinae and other muscles. We used 0.25×40mm (Tongki Co. Korea), 0.30×30mm, 0.30×50mm, 0.30×80mm (DongBang Acupuncture. Inc. Korea) acupuncture needles. The depth was around 8–20mm, according to the acupoints, and we performed this acupuncture therapy every day.

In electroacupuncture treatment, we used mixed or continuous wave, 3 Hz, 2–6V by PG-6 (伊藤超短波株式會社. Japan). The treatment points were EX-B2, ashi-points and above-mentioned acupoints. We selected these points alternately and stimulated for about 20 minutes.

Also, we performed direct-moxibustion treatment on EX-UE11 (十宣穴) twice a day and venesection treatment on 12-well points (十二井穴).

3) Physical Therapy

We performed electrical stimulation treatment (EST) and exercise therapy for one hour every day.

4) Bee Venom Aqua-Acupuncture Therapy

Bee venom was collected by stimulation of a microchip which can produce an electromagnetic wave and was dried and then was diluted with normal saline to 3000:1 in clean bench. Then after this, we operated on each acupoint with capacity of 0.1 cc, with depth of 3–6mm using a syringe of 1.0

ml (26gauge, Hwajin Medical Co. Ltd. Korea). We chose EX-B2 of C4-5, 5-6, L3-4, 4-5 part, ashi-points and the points of LI and ST such as LI4, LI11, LI15, ST36. We did this bee venom aqua-acupuncture therapy every other day (3 times a week, 30 times total during the hospitalization).

9. Progress

1) Changes of functional disability

We used the Amyotrophic Lateral Sclerosis Functional Rating Scale (ALSFRS). The ALSFRS is a useful instrument for evaluation of functional status and functional change in patients with amyotrophic lateral sclerosis (ALS)⁹⁾. The ALSFRS is composed of a 10 item functional inventory such as speech, handwriting, walking. Each item is rated on a 0–4 scale by the patient and/or caregiver, yielding a maximum score of 40 points (appendix). In this study, we assessed her ALSFRS every week (Fig. 4).

This patient had weakness in her arms and legs from Oct. 2000. She increased in strength so was able to walk with a cane and able to stay at home after the hospitalization in ○○ hospital in 2001. However, her weakness started to worsen again from Jan. 2003. She was able to sit but standing and walking was impossible by her first visit the Seoul Oriental Hospital, Kyungwon University. Her paralysis of limbs proceeded a little more so it became Gr. III by the 15th day (26th Mar.) of hospitalization. She also had some impairment in swallowing and breathing at that time.

She could do slow-handwriting, handle a spoon, dress with help and started walking with a walker on the 22nd day (2nd Apr.) of hospitalization. Her impairment in swallowing and breathing disappeared. She could handle chopsticks, walk with a cane, and climb stairs with assistance on the 36th day (16th Apr.) of hospitalization. Finally, she was

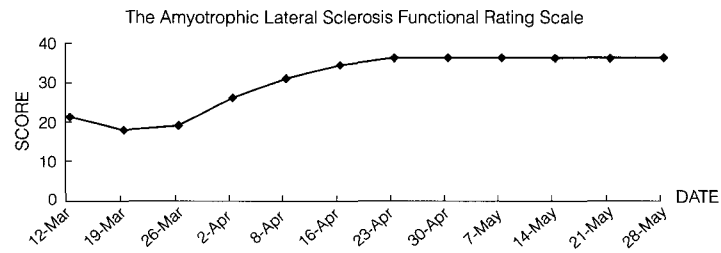


Fig. 4. Changes of ALSFRS after the treatment.

Table 1. Changes of Muscle Atrophy after Treatment

DATE	Mar 12	Mar 19	Mar 26	Apr 2	Apr 9	Apr 16	Apr 23	Apr 30	May 7	May 14	May 21	May 28
Thigh*	39/39	39/39	39/39	39/39	39/39	39/39	40/40	39/39	39/39	39/39	39/39	41/39
Calf†	31/30	31/30	31/30	31/31	32/32	33/33	33/34	33/33	33/33	33/34	33/33	34/33
Arm‡	27/27	27/27	27/27	28/28	28/28	29/29	29/30	29/29	29/29	30/30	29/29	30/29

* Thigh: Circumference measurement of 15cm above the patellar (Rt./Lt.)(cm)

† Calf: Circumference measurement of 15cm below the patellar (Rt./Lt.)(cm)

‡ Arm: Circumference measurement of 10cm above the elbow (Rt./Lt.)(cm)

able to walk alone and lead an independent daily life but had some feelings of anxiety about walking or climbing stairs after the 43rd day (23rd Apr.) of hospitalization.

She was able to leave hospital on the 81st day (31st May) of hospitalization.

2) Changes of Muscle Atrophy (Table 1)

3) Changes of Sensory Impairment

The patient had numbness and pain in both upper and lower extremities. There was hypesthesia in her calves, feet, forearms and hands and the sensation there was about 20% lower comparing with other normal areas (Fig. 5)⁶⁾. There was an improvement in the distribution and degree of hypesthesia after the treatment reaching normal sensation through the sensory test (in all the tests for temperature, pain, and tactual perception) by the 49th day (29th Apr.) of hospitalization (Fig. 6). Also, there was some reduction in the numbness and pain in extremities after the treatment.

Discussion

The peripheral nerves are the nerves outside of the brain and spinal cord, including the autonomic, cranial and spinal nerves. Peripheral neuropathy thus means disease of the peripheral nerves external to the brain and spinal cord, which includes diseases of the nerve roots, ganglia, plexi, autonomic nerves, sensory nerves and motor nerves.

Generally, it can be classified in demyelinating neuropathy and axonal degeneration neuropathy. Peripheral neuropathy also can be classified by where it occurs in the body.

Nerve damage that occurs in one area of the body is called mononeuropathy, in many areas, polyneuropathy. When the disorder occurs in the same places on both sides of the body, the condition is called symmetric neuropathy. There are many causes of polyneuropathy, however, in up to 50% of patients with polyneuropathy, no underlying cause can be found⁷⁾.

There are hundreds of different types of neuropathies and many different ways to categorize them including

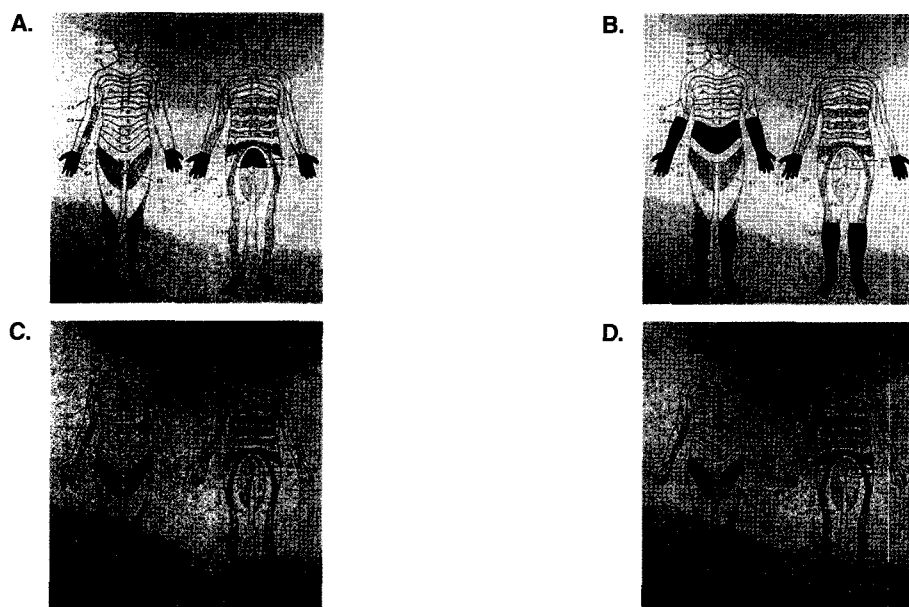


Fig. 5. Result of sensory test performed 12th Mar., 2003.

Black shows the area of hypesthesia.

A. Test of temperature perception by ice

C. Test of pain perception by needle

B. Test of temperature perception by warm water

D. Test of tactual perception by light touch

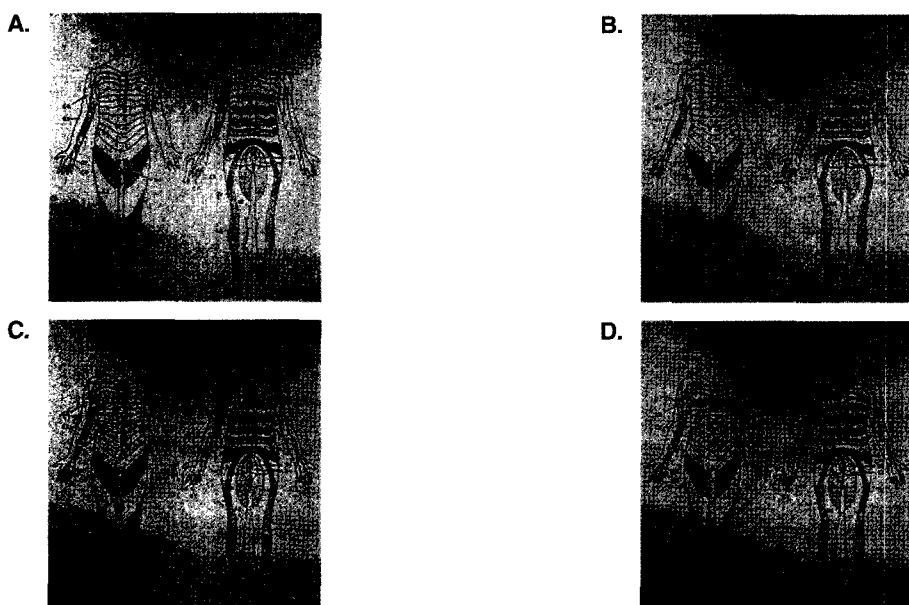


Fig. 6. Result of sensory test performed 29th Apr., 2003.

There were no areas of hypesthesia.

A. Test of temperature perception by ice

C. Test of pain perception by needle

B. Test of temperature perception by warm water

D. Test of tactual perception by light touch

by the tempo (e.g., acute, subacute or chronic), by the type of nerve affected (e.g., sensory, motor, or autonomic), or by the distribution of nerve injury (e.g., symmetrical, asymmetric, distal or proximal). It also can be categorized by cause, such as diabetic neuropathy and nutritional neuropathy. The motor symptoms are weakness, paralysis, foot drop and sometimes muscle contractions and spasms. The sensory symptoms are composed of negative and positive symptoms. The negative symptoms are decreased sensations usually of the symmetrical, bilateral distal part. This is called a "stocking and glove pattern". The positive symptoms are a burning sensation, dysaesthesia, hyperalgesia, hyperpathia and so on. Other signs of polyneuropathy include impaired in two-point discrimination, vibration sense, joint-position sense and muscle atrophy, loss or absent of reflexes⁸.

Therapy for peripheral neuropathy differs depending on the cause. For example, controlling diabetes may reduce diabetic neuropathy⁷. However, because the basic pathophysiologic mechanism of polyneuropathy is not yet understood, drug therapy has been empirical and, to date, universally unsuccessful. Symptomatic control is the present therapeutic goal. In addition, it is very difficult to recover, especially in case of axonal degeneration. In result, there are many studies for preventing axonal degeneration and regenerating the axons^{9,10}.

If polyneuropathy's main symptom is paralysis or weakness of the limbs, it can be called Wijeung (痿症) in Oriental medicine. Wijeung (痿症) is characterized by weakness of bilateral limbs and impairment of movement¹. According to many Oriental medical texts, the causes of Wijeung (痿症) can be summarized as "hypofunction of the spleen and stomach (脾胃虛弱)", "invasion of damp-heat (濕熱浸淫)", "hypofunction of the liver and kidney (肝腎虛弱)", etc. The therapy can thus be determined as "clear up heat and promote

secretion of body fluids (清熱生津)", "remove damp-heat (清利濕熱)", "invigorate the spleen and replenish qi (健脾益氣)", "tonify the liver and kidney (補益肝腎)", "replenish qi and promote blood flow (益氣活血)" and so on, depending on the causes¹¹. In connection with this Wijeung [(痿症)], there are many studies which show the good effects of Oriental medical treatment¹²⁻¹⁴. However, these are chiefly related to ALS or Guillain-Barre syndrome, and there are few studies on polyneuropathy, so I'd like to verify the effect of Oriental medical treatment on polyneuropathy.

The patient in this study was diagnosed with polyneuropathy with axonal degeneration through clinical symptoms, MRI of spine, EMG and nerve biopsy at ○○ hospital. She was hospitalized at Seoul Oriental Hospital, Kyungwon University, from 12th Mar. to 31st May, 2003. We use the ALSFRS for evaluation of functional status and functional change in this patient. The ALSFRS was devised for use in therapeutic trials in ALS. ALS is a degenerative disorder affecting upper motor neurons in the brain and lower motor neurons in the brain stem and spinal cord. Clinical manifestations include progressive weakness, atrophy, fasciculation, hyperreflexia, dysarthria, dysphagia and eventual paralysis of respiratory function. It also can be called Wijeung (痿症) in Oriental medicine¹². Besides this, we measured the circumference of the thighs, calves and arms for evaluation of the changes of muscle atrophy and performed sensory test for checking the changes of sensory impairment.

This patient had weakness in her limbs and sensory impairment with constipation, dipsia, red-face, reddened tongue with white coating, frequent pulse, etc. We made a diagnosis of Wijeung (痿症) caused by invasion of damp-heat (濕熱浸淫) and prescribed BoYangHwanO-Tang (*buyanghaiwu-tang*) and CheongJo-Tang (*qingzao-tang*) in order to cure the motor and sensory

impairment and remove the damp-heat (清利濕熱). BoYangHwanO-Tang (*buyanghaiwu-tang*) derived from Yi Lin Gai Cuo (醫林改錯) has an effect of replenishment qi and promotion of blood flow, so it is usually used for cerebral paralysis and poliomyelitis¹⁵. CheongJo-Tang (*qingzao-tang*) has the effect of removal the damp-heat (清利濕熱), so it treats Wijeung (痿症) caused by invasion of damp-heat (濕熱浸淫)¹⁶. In acupuncture treatment, we mainly chose the points of yang-ming meridian (陽明經) such as LI4, LI11, LI15, ST36 etc., in order to invigorate the spleen and stomach¹⁷. Sometimes we chose EX-B2, which can promote the flow of qi and increase neurotransmission¹⁷. We performed bee venom aqua-acupuncture therapy every other day, because it has analgesic effect and can enhance the immune system¹⁸. Also we did electroacupuncture treatment. In addition, we performed direct-moxibustion treatment in EX-UE11 and venesection treatment in 12-well points in order to cure the numbness and pain of extremities. EST and exercise therapy stimulated muscle contractions and prevented muscle atrophy¹⁹.

The results according to the above treatments are as follows. The functional disability checked by ALSFRS was 21 at the first examination and became 18-19 because of proceeding paralysis until the 15th day of hospitalization. Then, she improved gradually such that the ALSFRS went up to 36 by the 43rd day of hospitalization. Finally, she could live an independent daily life with some remaining feelings of anxiety about walking or climbing stairs. She had diffuse atrophy upon her first examination but there was no procession of muscle atrophy after the treatment and muscular bulk started to increase after 2nd Apr., once beginning to walk. This patient had numbness, pain and decreased sensation on both upper and lower extremities upon first examination but there was no hypesthesia after the 49th day of hospitalization and some improvement in

numbness and pain of extremities.

We were able to get good results through conservative Oriental medical treatment for polyneuropathy. However, there is some limitation in that we studied only one case.

It is known that the natural courses of polyneuropathy are poor, showing repetitive improvement and deterioration. Sometimes patients recover naturally having no concern for treatment. Therefore, study of more cases of patients with polyneuropathy and a long term study will be necessary in the future.

Summary

We performed a conservative Oriental medical treatment on a woman of 68 years, who had weakness, paralysis, numbness and pain in her limbs and extremities. We diagnosed her with polyneuropathy and Wijeung (痿症) and performed herbal-medication, acupuncture and moxibustion, bee venom aqua-acupuncture therapy from 12th Mar. to 31st May, with hospitalization at Seoul Oriental Hospital, Kyungwon University. Following these Oriental medical treatments, she saw improvement in functional disability, muscle atrophy and sensory impairment. From this we can study the good effects of Oriental medical treatment on polyneuropathy.

References

1. Korean Association of Oriental Rehabilitation Medicine. Oriental Rehabilitation Medicine. Seoul: Koonja Publishing Inc. 2003:128,133,294-295.
2. No JH, Ko CN, Cho GH, Kim YS, Bae HS, Lee GS. A Study on Wijeung in Oriental Medicine and Western Medicine. Korean J. Orient. Int. Med. 1996;17(1):81-106.
3. Editors of Harrison's. Harrison's Principles of Internal Medicine. New York: McGraw-Hill Inc. 1994:2368-

- 2378.
4. Kim KM, Suh DW, Lee SB, Myung HJ, Lee GW. Study on Clinical Courses of Vasculitic Neuropathies. *The Journal of the Korean Neurological Association*. 1995;13(1):47-53.
 5. The Amyotrophic Lateral Sclerosis Functional Rating Scale. The ALS CNTF treatment study (ACTS) phase I-II Study Group. *Arch Neurol*. 1996;53(2):141-147.
 6. JSP Lumley, P-MG Bouloux. *Clinical Examination of the Patient*. Oxford: Butterworth-Heinemann Ltd. 1994:155-160.
 7. Adams RD, Victor M, Ropper AH. *Principles of Neurology (Korean Language edition)*. Seoul: JungDam Publishing Co. 1998:1202-1212.
 8. Lindsay KW, Bone I. *Neurology and Neurosurgery Illustrated (Korean Language edition)*. Seoul: PanMun Book Co. 2002:741-767.
 9. Song DH, Rhee WI, Ko YJ, Shin JN, Lee SE, Yeo JH. Electrophysiologic and Clinical Effects of Thioctic Acid on Diabetic Polyneuropathy. *Journal of the Korean Association of EMG-Electrodiagnostic Medicine*. 2001;3(2):97-102.
 10. Park YC, Suh JK, Yi SD. The Effect of Gangliosides Administration on Motor Nerve Conduction Velocity in Diabetic Peripheral Neuropathy. *J. Korean Med. Assoc.* 1987;30(8):863-868.
 11. Park CG. A Study of Literature Review on the Therapeutic Measures of Wijeung. *Journal of East-West Medicine*. 1992;17(4):36-55.
 12. Park BW, Lee E, Ko H. A Study on the Efficiency of Riluzole and Oriental Medical Treatment in Amyotrophic Lateral Sclerosis. *Korean J. Orient. Int. Med.* 2001;22(2):279-283.
 13. Kim YK, Kim KN, Song YS, Lim HH. A Case Report on Wijeung (痿證). *J Oriental Rehab Med* 2001; 11(3):165-173.
 14. Kim DE, Shin KS, Kim KH, Jeong SH, Shin GC, Lee WC. A Case of a Patient Suspected as Guillain-Barre Syndrome. *J. of Oriental. Chr. Dis.* 2000;6(1):133-138.
 15. Yun GY. *Herbal Prescription and It's Explanation*. Seoul: Uiseongdang. 1998:493-495.
 16. Heo J. *Donguibogam*. Seoul: Namsandang. 1978:305.
 17. Ahn SG, Lee SR, Yang YS. The Treatise Research on Hua-Tuo-Jia-Ji-Xue (華佗夾脊穴). *The Journal of Korean Acupuncture & Moxibustion Society*. 2000;17(4):139-148.
 18. Kim YM, Lee JD, Park DS. The Anti-Cancer Effect of Apamin in Bee-Venom on Melanoma Cell Line SK-MEL-2 and Inhibitory Effect on the MAP-Kinase Signal Pathway. *The Journal of Korean Acupuncture & Moxibustion Society*. 2001;18(4):101-115

Appendix

The Amyotrophic Lateral Sclerosis Functional Rating Scale (Max 40 point)

1. Speech: Normal speech process (4), Detectable speech disturbance (3), Intelligible with repeating (2), Speech combined with nonvocal communication (1), Loss of useful speech (0)
2. Salivation: Normal (4), Slight but definite excess of saliva in mouth, may have night time drooling (3), Moderately excessive saliva, may have minimal drooling (2), Marked excess of saliva with some drooling (1), Marked drooling, requires constant tissue or handkerchief (0)
3. Swallowing: Normal eating habits (4), Early eating problems-occasional choking (3), Dietary consistency changes (2), Needs supplemental tube feedings (1), NPO (0)
4. Handwriting: Normal (4), Slow or sloppy-all words are legible (3), Not all words are legible (2), Able to grip pen but unable to write (1), Unable to grip pen (0)
5. Cutting food and handling utensils
 - Patient without gastrostomy: Normal (4), Somewhat slow and clumsy, but no help needed (3), Can cut most foods, although clumsy and slow, some help needed (2), Food must be cut by someone, but can still feed slowly (1), Needs to be fed (0)

- Alternate scale for patients with gastrostomy: Normal (4), Clumsy but able to perform all manipulations independently (3), Some help needed with closures and fasteners (2), Provides minimal assistance, but can still feed slowly (1), Unable to perform any aspect of task (0)
- 6. Dressing and hygiene: Normal function (4), Independent and complete self care with effort or decreased efficiency (3), Intermittent assistance or substitute methods (2), Needs attendant for self-care (1), Total dependency (0)
- 7. Turning in bed and adjusting bed clothes: Normal (4), Somewhat slow and clumsy, but no help needed (3), Can turn alone or adjust sheets, but with great difficulty (2), Can initiate, but not turn or adjust sheets alone (1), Helpless (0)
- 8. Walking: Normal (4), Early ambulation difficulties (3), Walks with assistance (2), Non ambulatory functional movement only (1), No purposeful leg movement (0)
- 9. Climbing stairs: Normal (4), Slow (3), Mild unsteadiness or fatigue (2), Needs assistance (1), Cannot do (0)
- 10. Breathing: Normal (4), Shortness of breath with minimal exertion (3), Shortness of breath at rest (2), Intermittent ventilatory assistance (1), Ventilator-dependent (0)