

원저

Clinical Studies of Amyotrophic Lateral Sclerosis (ALS) through Korean Medicine

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국문초록

한방치료를 통한 근위축성 측삭경화증(ALS)의 임상적 연구

권기록

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목적 : 대표적인 motor neuron disease(MND)이면서 가장 치명적인 신경퇴행성 질환인 ALS의 발생 양상과 한방치료효과에 대하여 연구하였다.

방법 : 상지대학교 부속 한방병원에 래원한 ALS 환자들의 성별, 연령, 발병일, 발병양상, 래원 당시의 병태양상 등을 분석하였고, 이 중 3개월 이상 입원치료를 통하여 치료과정 평가가 가능하였던 18명의 환자들의 치료 전과 치료 후의 변화양상을 평가하였다.

결과 : 외국의 보고에 비하여 여성 환자가 많았고 발병 연령도 유의하게 낮았으며 상지에서 최초의 증상이 발현되는 비율이 상대적으로 높았다.

Bulbar Form의 비율도 높았고, 대부분의 환자가 여성인 것도 특이하였다.

환자들이 생각하는 질병의 발생원인 중 약 80%가 stress나 정신적 충격 등을 지적하여 정신적 불안상태가 질병의 발생과 연관함을 추정할 수 있었다.

한방치료가 ALS를 호전시키지는 못하였으나 진행을 억제하였고, 국소적인 주소증을 완화시키며 심리적 안정 상태를 유지하는데 도움이 된다고 평가되었다.

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Introduction & Background

ALS, also known as Lou Gehrig's disease, is a progressive disorder that causes degeneration of the motor neurones of the brain and spinal cord¹⁾. Symptoms include spasticity, muscle weakness and paralysis, impaired speaking, swallowing and breathing. ALS is extremely distressing for patients and their families. The disease is relentlessly progressive and death usually occurs within 3–5years.^{2),3)} Survival time is significantly reduced when the disease starts with bulbar symptoms or at an older age. Death usually occurs from respiratory infection and failure and complications of immobility. There is no cure and treatment consists mostly of symptomatic, supportive and palliative.

Epidemiology

The prevalence of motor neurone disease is around 7 per 100,000. ALS constitutes between 65–85% of this. Incidence rises with age. The worldwide incidence of the disease is about 6 cases per 100,000 population²⁾. Onset of the

disease is usually between the ages of 40–60.

Results

Then we have conducted clinical studies on 46 ALS patients diagnosed by EMG or biopsy, including 18 admitted patients at the Sangji University Oriental Medicine Hospital to see how Oriental medicine can help the treatment of ALS.

The treatment methods from Oriental medical perspectives are classified into 4 types of ; acupuncture, herbal acupuncture, Bee venom herbal acupuncture therapy, and herbal therapy.

1. Acupuncture treatment was done mainly using five elements acupuncture according to specific symptoms. Tonification and sedation were done by twisting the needle. Two meridian points were selected bilaterally and the treatment was rendered once a day.

2. For the herbal acupuncture treatment, to prevent possible uprising of fever from the treatment, points of GB21(fengchi, 風池) and GB20(jianjing, 肩井) were carefully selected. And 0.1 cc of *Juglandis Semen* (JsD) herbal acupuncture was injected at these points.

To treat the heat in the lower chest, 0.1cc of BUM(Calculus Bovis · Fel Ursi · Moschus) herbal acupuncture was injected CV17(tanzhong, 膻中), CV16(zhongting, 中庭), CV12(zhongwan, 中完), and others. Herbal acupuncture treatment was done in conjunction with acupuncture.

3. Bee venom acupuncture was administered on the points of ST36(zusanli, 足三里), LI11(quchi, 曲池), BL23(shenshu, 腎俞), and BL26(guanyuanshu, 關元俞) to fortify atrophied muscles. CV6(qihai, 氣海) was chosen to bring down the fire. Early in the treatment, patients received 0.2cc(5×10^{-4} mg/ml) of bee venom on two points and gradually increased to 2cc on several points per day.

4. Prescriptions were generally made based on the differential diagnosis of visceral organs and the patients with distinctive constitution were given four constitutions formula. Yanghyuljanggeungunbohwan was used as the primary prescription⁴⁾.

And follow-up carried out using ALS Functional Rate Scale(ALSFRS)⁵⁾. ALSFRS evaluated 18 patients who were admitted for more than 3 months and it was conducted once a month.

Statistics

Statistical analysis were performed using the Statistical Package for Social Science software SAS(version 6.1.2). Data were analyzed by Wilcoxon Signed Ranks Test. $P < 0.05$ was considered to indicate statistical significance.

ALSFRS is most commonly used evaluation technique for progression of ALS. ALSFRS was compared between before and after treatment. ALSFRS is consist of as follows.

【The Amyotrophic Lateral Sclerosis Functional Rating Scale(ALS FRS)】

- (1) Speech
 4. Normal speech processes.
 3. Detectable speech disturbances.
 2. Intelligible with repeating.
 1. Speech combined with nonvocal communication.
 0. Loss of useful speech.
- (2) Salivation
 4. Normal.
 3. Slight but definite excess of saliva in mouth ; may have nighttime drooling.
 2. Moderately excessive saliva ; may have minimal drooling
 1. Marked excess of saliva with some drooling.
 0. Marked drooling ; requires constant tissue or handkerchief.
- (3) Swallowing
 4. Normal eating habits.
 3. Early eating problems ; occasional choking.
 2. Dietary consistency changes.
 1. Needs supplemental tube feeding.
 0. NPO(exclusively parenteral or enteral feeding)
- (4) Handwriting
 4. Normal.
 3. Slow or sloppy ; all words are legible.

2. Not all words are legible.
 1. Able to grip pen but unable to write.
 0. Unable to grip pen.
- (5) Cutting Food and Handling Utensils(patients without gastrostomy-feeding tube)
4. Normal.
 3. Somewhat slow and clumsy, but no help needed.
 2. Can cut most foods, although clumsy and slow ; some help needed.
 1. Food must be cut by someone, but can still feed slowly.
 0. Needs to be fed.
- (6) Dressing and Hygiene
4. Normal function.
 3. Independent and complete self-care with effort of decreased efficiency.
 2. Intermittent assistance or substitute methods.
 1. Needs attendant for self-care.
 0. Total dependence.
- (7) Turning in Bed and Adjusting Bed Clothes
4. Normal.
 3. Somewhat slow and clumsy, but no help needed.
 2. Can turn alone or adjust sheets, but with great difficulty
 1. Can initiate, but not turn or adjust sheets alone
 0. Helpless.
- (8) Walking
4. Normal.
 3. Early ambulation difficulties.
 2. Walks with assistance.
 1. Non-ambulatory functional movement.
 0. No purposeful leg movement.
- (9) Climbing Stairs
4. Normal.
 3. Slow.
 2. Mild unsteadiness or fatigue.
 1. Needs assistance.
 0. Cannot do.
- (10) Breathing
4. Normal.
 3. Shortness of breath with minimal exertion(e.g. walking, talking).
 2. Shortness of breath at rest.
 1. Intilator intermittent(e.g. nocturnal) vey assistance.
 0. Ventilator dependent.

Results

1. Gender and age distribution of the patients

The period from onset to the first medical Sex & Age examination in Sangji University Oriental Medicine Hospital is 35.0 ± 25.5 months. Average of ALSFRS of 46 ALS patients is 25.9 ± 7.0 points. Average of Age is 49.6 ± 10.5 years old. This graph shows gender and age distribution of the patients. Good percentage of the patients lie between 40's to 60's. But it can strike anyone even in the 20's or 70's <Fig. 1>.

2. Initial location of abnormal condition

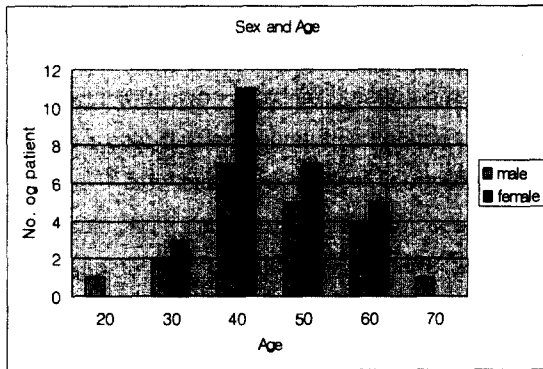


Fig. 1 Gender and age distribution of the ALS patients.

Approximately 57% of the patients reported abnormality in the shoulder and digits. 26% reported spasm in the feet or the thigh area, 17% complained verbal disturbance. Verbal disturbance was more common among the female patients<Fig. 2>.

3. Patient's opinion on the cause of illness

Nearly 80% of the patients believe that the disease was triggered by emotional stress and

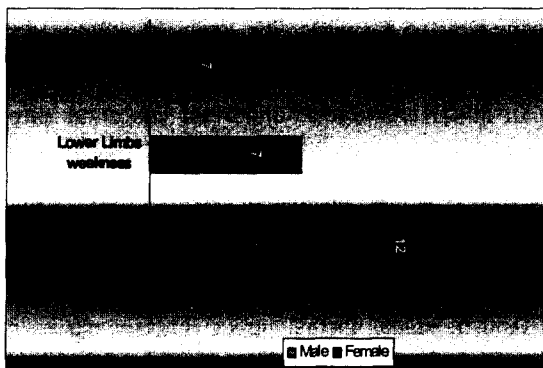


Fig. 2 Initial location of abnormal condition.

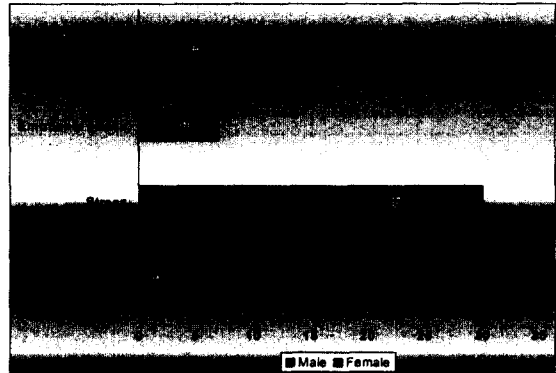


Fig. 3. Patient's opinion on the cause of illness

psychological shock, thus we can suggest that the psychological aspect plays significant role in the onset of disease<Fig. 3>.

4. The change of ALSFRS before and after treatment

Statistically, there isn't any sign of improvement after 3 to 6 months of treatment through Korean medicine. But considering the symptoms of ALS only worsen as the time goes, we can carefully conclude that the treatment is suppressing the progression of disease<Table 1>.

Table 1. Comparison of ALSFRS According to Treatment Stage

Stage	Numbers	Scores Mean±S.D.	p-value
Before Treatment	18	21.11±6.13	0.441
After 3-6months	18	20.42±5.99	

Table 2. Changes of ALSFRS after 3-6 months treatment

	Improved	No changed	became worse
Number	7	4	7

7 of the 18 patients showed improvement in ALSFRS measurement, 4 sustained condition at the time of admission, and 7 showed worsening of the symptoms.

Among the patients with improvement, 6 patients improved in verbal skill, 3 patients in breathing, and 2 patients alleviated in swallowing and increase in muscular strength, respectively <Table 2>.

11 patients expressed overall improvement in general condition and psychological stability.

Discussion

ALS is the most common and well recognized of the motor neuron diseases, and is one of the most devastating diseases in neurology⁶⁾. ALS is a progressive, fatal neurodegenerative disorder characterized by loss of motor neurons leading to muscle weakness. sensation and mental function stay intact during the course of the disease.

The average survival time from initial weakness is 3 years. About 15-20% of all patients survive longer than 5 years^{7),8)}.

No conclusive reason for the onset of disease is known as of today, but one of the

assumption is by mutant Cu/Zn superoxide dismutase(SOD1) leads to motor neurone death⁹⁾. Other hypotheses include environmental factors, autoimmune phenomena, oxidative stress, viral infection, free radical, and etc¹⁰⁾.

Because of unknown cause, no treatment methods exist. The onset of the disease has increased by twofold in the last two decades¹¹⁾, and the medical community must be on a mission to seek for the treatment technique¹²⁾.

This research was conducted to evaluate how the approach in Oriental medicine treatment can affect ALS. Analyzing the data collected from a total of 46 patients including 18 admitted patients for more than 3 months at Sangji University Oriental Medicine Hospital ALS Clinic, we had more female patients by the ratio of 57 : 43.(26 female and 20 male). Female showed higher ratio of death 55 : 45 reported by White¹¹⁾ and 40 : 60 distribution ration analyzed by Cashman¹³⁾, thus further epidemiological study must be conducted. Average age of the onset was 46.7, and this was somewhat different from 54.1 years for women and 54.1 years for man in Cashman's findings¹³⁾ ($p < 0.005$).

In initial location of abnormal condition, site of onset was spinal in 83% of patients, and 17% had an initial bulbar form. This result indicates much higher ratio for bulbar form compared to 92 : 8 for Cashman¹³⁾ ($p < 0.005$).

And in spinal forms, upper limbs were earlier affected than lower limbs(57 : 26). This result also indicates higher ratio at our clinic

than 40 : 60 for Cashman.13)

One peculiar finding was that most of patients with bulbar form were women(87.5%).

In response to the question "What is the cause of onset of ALS?", approximately 65% responded with emotional stress, and 15% for psychological shock. Thus nearly 80% of the patients pointed psychological aspect as the cause of ALS, and this is an important issue for further investigation. Evaluating ALSFRS data after 3 to 6 months of treatment with Oriental medicine, 40% had slight improvement, 20% at stasis, and 40% showed aggravation. Statistically, patients didn't show progression of the disease. Considering ALS is a progressive motor neuron disease, we can deduce treatment through Oriental medicine induce partial enhancement by inhibiting progression of the disease and increasing physical strength.

Based on these results, we have to design longer-term, systematic, and more efficient treatment methods. Since ALS patients aren't able to carry out daily living activities without help of other person, we need to acknowledge emotional and financial difficulties of the patients and their families.

A sponsorship at the government and societal level can definitely lighten the burden on the ALS patients.

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