

## **The intervention effect of Wuling capsule on inflammatory reaction in patients with post-stroke fatigue.**

Liu Fengli<sup>1</sup>, Li Yan<sup>2\*</sup>, Xu Yanli<sup>1\*</sup>

<sup>1</sup>School of Medicine, Hebei Engineering University, PR China

<sup>2</sup>Affiliated Hospital of Hebei Engineering University, PR China

### **Abstract**

**Objective:** To use Wuling capsule drugs to give intervening treatment for change and generation mechanism of the patients with post-stroke fatigue.

**Methods:** 140 cases of fatigue patients post stroke treated in our hospital were randomly divided into two groups: control group and observation group, 70 cases in each group. The control group was treated with oral vitamin C, the observation group was treated with Wuling capsule, and the quality of life and the degree of changes of inflammatory cytokines in patients with fatigue the brain after stroke were analysed and compared.

**Results:** compared with the control group, the expression levels of inflammatory cytokines IL-1 $\beta$  and IL-10 in the observation group were significantly decreased, the expression of IL-9 increased significantly, the difference between groups was significant ( $t=6.552$ ,  $t=5.844$ ,  $P<0.05$ ); the Barthel index score increased significantly, there is a statistically significant difference between the two groups ( $P<0.05$ ).

**Conclusion:** Wuling capsule can effectively inhibit the release rate of inflammatory factor, reduce the expression level of related inflammatory factors, effectively improve the fatigue after stroke and promote the early rehabilitation. It has a reference value in clinical practice.

**Keywords:** Wuling capsule, Post-stroke fatigue, Inflammatory response.

*Accepted on September 20, 2017*

### **Introduction**

Fatigue is a subjective perception unwilling to conduct daily activities or general activities desired before due to lack of bodily or mental energy. Currently, post-stroke fatigue is considered as one of the most common symptoms after stroke by Ingles. With the aging of society, the incidence of the disease has shown a great increase in recent years, and generally occurs among older people.

The pathogenesis of the disease is that the lesions in the pathogenic related tissues such as brain vascular nutrition can make intracranial vascular occlusion narrowed, or even rupture to brain damage, leading to obstacles of cerebral blood circulation system. After the brain hemorrhage occurs, the disease develops rapidly, and the clinical manifestations are abnormal in consciousness, limbs and language, and even transient or permanent brain dysfunction [1].

Fatigue is a subjective feeling of inactivity or lack of sexual activity caused by lack of energy in the body or mind. Stroke patients are seriously ill, the course of disease is long, and it has a great impact on the quality of life of patients and families, causing great negative impact on the physical and mental health of patients.

At present, studies have shown that Wuling capsule has an inflammatory reaction in patients with post-stroke fatigue, and is related to the release of inflammatory cytokines. Factors involved in the inflammatory response of the body, such as interleukin (IL-1, beta, IL-9 and IL-10). If not controlled, it can enhance the damage to the body, and aggravate the injury, further promote the release of inflammatory cytokines, into a vicious cycle and increase complications. According to the theory of Chinese medicine, Chinese medicine has its unique advantages in treatment and plays a good effect by formula compatibility.

As reported, Wuling capsule mainly through the application of fatigue in patients, can improve immune function of fatigue patients and reduce the degree of immune response, has been widely used in the treatment of various inflammatory diseases with good efficacy [2,3]. With the increasing incidence of and in-depth understanding for the stroke, more and more Chinese medicines were applied in clinical studies. Post-stroke fatigue is closely related to living quality and death risk.

In this paper, Wuling capsule is used to treat the patients with post-stroke fatigue, and the clinical efficacy is analysed.

## Materials and Methods

### General information

140 cases of patients with post-stroke fatigue treated in our hospital from August 2016 to May 2017 were randomly divided into two groups: control group and observation group, 70 cases in control group of 27 male and 43 females, aged between 45-76 y old, with average age ( $63.1 \pm 6.3$  y old); of the 70 patients in the control group, 25 were males and 45 of females, aged from 43-74 y, with an average age of ( $61.7 \pm 7.6$  y old). The inclusion criteria are that the clinical features meet the diagnostic criteria, with the clear awareness and good communication and there is no serious disease in the heart, liver, kidney and endocrine. The two groups were approved by the ethics committee and signed on the informed consent form. The basic personal information of all patients included gender, age, disease degree and other general data. After analysis and comparison, there was no significant difference between the two groups with  $P > 0.05$ , which was comparable.

### Therapeutic method [4]

Patients in the control group received oral vitamin C tablets 0.1 g times a day, 3 times a day. The observation group was treated with Wuling capsule (manufacturer: Zhejiang Zuoli pharmaceutical Limited by Share Ltd), 0.33 g/granules, 3 times a day. The two groups were given antiplatelet agents such as aspirin 100 mg/d or clopidogrel 75 mg/d, statins such as simvastatin 20-40 mg/d or atorvastatin 10-20 mg/d. 12 w is a course of treatment, but the two groups cannot receive antidepressant treatment. At the time of attack and in 6 and 12 months afterwards, 10 ml blood sample is taken from the patient's vein with an empty stomach in the morning after he has been admitted and then centrifuged for 10 min at 3000 r/min. The separated serum is separated in EOP pipes with 800  $\mu$ l serum sample in each EP pipe and conserved in a  $-70^{\circ}\text{C}$  refrigerator. The Enzyme Linked Immunosorbent Assay (ELISA) is adopted to determine IL-1 $\beta$ , IL-9 and IL-10 in plasma. The kits were purchased from American Rapidbio Company and the operating methods are in accordance with the inserts.

### Statistics method

The statistical data obtained from the two groups treated with different methods were compared by SPSS 14. When using the t-test, the measurement data is expressed as ( $\bar{x} \pm s$ ), and  $P < 0.05$  indicates the difference is significant.

## Results

### Comparison of inflammatory factors between the two groups before and after treatment

From the results, the levels of IL-1 $\beta$ , IL-9 and IL-10 in the two groups before Wuling capsule treatment had no significant difference ( $t=1.789$ ,  $t=2.114$ ,  $t=2.003$ ,  $P > 0.05$ ), the levels of IL-1 $\beta$  and IL-10 in the observation group after Wuling capsule

treatment were significantly lower than the control group ( $t=6.552$ ,  $t=5.844$ ,  $P < 0.05$ ), but the IL-9 level greatly increased obviously, the difference between two groups was significant ( $t=7.013$ ,  $P < 0.05$ ) (Table 1).

**Table 1.** Comparison of inflammatory factors in the two groups.

Grouping		IL-1 $\beta$ ( $\mu\text{g/L}$ )	IL-9 ( $\mu\text{g/L}$ )	IL-10 ( $\mu\text{g/L}$ )
Treatment group	Before treatment	$17.49 \pm 2.82$	$15.10 \pm 3.40$	$6.92 \pm 1.48$
	After treatment	$25.87 \pm 3.75$	$9.61 \pm 2.31$	$10.77 \pm 2.02$
Control group	Before treatment	$16.95 \pm 2.11$	$12.17 \pm 2.99$	$7.01 \pm 1.61$
	After treatment	$34.11 \pm 4.25$	$8.93 \pm 3.08$	$14.66 \pm 2.18$

### Comparison of quality of life between the two groups

The Barthel scores before and after treatment were compared. The Barthel index score of the observation group before treatment was ( $36.71 \pm 3.63$ ), while ( $58.87 \pm 4.28$ ) after treatment, and Barthel score increased significantly after treatment compared with that of control group ( $P < 0.05$ ). The curative effect of the treatment group and the control group were statistically analysed, the effect of Wuling capsule treatment is obviously better than the control group treatment ( $P < 0.05$ ) (Table 2).

**Table 2.** Comparison of quality of life between the two groups ( $\bar{x} \pm s$ ).

Groups	Barthel index score before treatment	Barthel index score after treatment
Control group	$37.09 \pm 3.58$	$44.02 \pm 3.97$
Treatment group	$36.71 \pm 3.63$	$58.87 \pm 4.28$

## Discussion

When stroke occurred, the body was in high stress state, prompting the stress response and inflammatory cytokines over-activation. The interaction occurred in a series of complex pathological processes, which can affect the body organs. Inflammatory response of patients was mainly as inflammatory cytokines, and then damages the body's main organs through the inflammatory cascade amplification effect, resulting in the main organs of the body dysfunction, thus suppress the body to recover quickly. It is prone to produce excessive inflammation without timely control, and even lead to the occurrence of systemic inflammatory response syndrome and multiple organ failure syndrome [5]. Stroke has a very high lethal, morbidity, the survivors are often accompanied by different degrees of dysfunction after treatment, including self-care ability, decreased athletic ability, poor cognitive and other adverse symptoms. These inevitable sequelae bring significant impact on the patient's living standards and quality, the elderly health problems have aroused the concern of researchers. If there is not timely and effective measure, it will pose a great threat to

the lives and health of patients. At present Western medicine was commonly used in the clinical treatment, but no significant improvement was achieved. The need for drugs with better efficacy and less side effects as a substitute is urgent in the clinical treatment, and its further development of a sound treatment program is the key. It is reported that the use of appropriate Chinese medicine treatment measures based on the etiology and pathogenesis have a better effect. It was demonstrated that Wuling capsule in the treatment of disease has a unique advantage and effectively improves the symptoms of patients.

Wuling Capsule is a pure traditional Chinese medicine prepared by modern biotechnology, which is widely used as a good immunomodulator. It has high safety and low side effect, and can play a role in protecting the body's phagocytic cells and immune function to improve post-stroke depression in patients with depression, but also inhibit stress response from various mechanisms, suppress inflammatory cytokine release, downregulates the expression of IL-1 $\beta$ , IL-9 and IL-10 by stress response, and improve immune function, so this study is focus on its clinical effect [6].

The experimental results showed that, when compared with the control group, the expression levels of IL-1 $\beta$ , IL-9 and IL-10 in the observation group changed obviously, of which the difference was significant ( $P < 0.05$ ), and the Barthel score of the observation group increased. The increase of IL-1 $\beta$  and IL-10 could promote post-stroke fatigue and decrease of IL-9 expression could also promote post-stroke fatigue. So, it could predicted that the anti-fatigue mechanism of Wuling capsule might be to reduce IL-1 $\beta$  and IL-10 expressions and increase IL-9 expression so as to improve post-stroke fatigue. It means that Wuling capsule can effectively inhibit the release of inflammatory factors, reduce the expression level of related inflammatory factors, improve the quality of life and promote the rehabilitation of the body, and has a reference value in clinical practice.

In summary, the positive measures should be employed to deal with body damage caused by post-stroke fatigue, some studies showed that Wuling capsule treatment had its superiority, improved the therapeutic effect, and played an effective way to improve the clinical symptoms of patients and the quality of the patient life. As the ideal drug for the treatment of post-stroke fatigue, Wuling capsule is more conducive for the control of the disease, has a certain guiding value for the clinical treatment to provide a choice of timing of treatment,

Therefore, the rational and effective treatment can quickly achieve the purpose of healing, the traditional Chinese medicine in clinic has the value of popularization and application, worthy of clinical reference.

### **Acknowledgement**

This research was supported by 1. National natural science foundation project (81373095); Handan city science and technology research and development project (1623208060).

### **References**

1. Guo CK. The effect of Wuling capsule on the inflammatory state of patients with maintenance hemodialysis. *Mod Med J China* 2012; 14: 63-65.
2. Chen YK, Lan YH, Li WY. The efficacy of Wuling capsule for the treatment of post-stroke fatigue. *Guangdong Med J* 2014; 35: 599-601.
3. Liu LF, Li Y, Jiao LY. Effects of ulin capsule on the inflammatory response of patients with post-stroke fatigue. *Chin J Gerontol* 2017; 37: 1625-1627.
4. Ran SL. Clinical research of citalopram combined with Wuling capsule on the treatment of post-stroke depression. *J Qiqihar Univ Med* 2012; 34: 10-16.
5. Shi MK, Zhang QH, Chen BJ. Effects of ustodin on postoperative stress and inflammatory response in patients with esophageal cancer. *Mod Med* 2010; 38: 170-172.
6. Li Z, Zhao ZX. Research progress in the basic and clinical application of ulin capsules. *Chinese Trad Med* 2010; 32: 120-121.

### **\*Correspondence to**

Li Yan

Affiliated Hospital of Hebei Engineering University

Hebei

PR China

Xu Yanli

School of Medicine

Hebei Engineering University

PR China