

# Wound healing activity of a traditional Chinese medicine (Longxuejie) in capsule dosage form

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**Abstract:** This study was designed to investigate the wound healing effects of a Traditional Chinese Medicine (Longxuejie) combined with dragon's blood capsule. A total of 80 patients with ulcerative bedsore observed in our hospital department of Geriatrics were selected from May 2016 to May 2017. They were randomly divided into control group received Longxuejie capsules and study group received new wound dressing combined with Longxuejie, 40 cases in each group. Clinical efficacy and degree of pain were observed and compared in patients. The total effective rate was 95.00% in study group and 85.00% in control group ( $P < 0.05$ ). There was no significant difference in laboratory indexes and pain degree between two groups before treatment ( $P > 0.05$ ). The difference was statistically significant after treatment ( $P < 0.05$ ). New wound dressing combined with dragon blood capsule in the treatment of bedsore in the elderly ulcers can achieve ideal clinical efficacy and effectively relieve the pain degree of patients, which can be used as the preferred treatment program.

**Keywords:** New wound dressing, Dragon's blood capsule, ulcer stage bedsore.

## INTRODUCTION

Bedsore in ulcer stage is common in bedridden patients and is also a serious type of complication. If it is not timely disposal, it often leads to a variety of adverse outcomes, even endangers patient's life safety (Ajami and Khaleghi, 2015). Wound dressings are materials used to cover sores, wounds or other injuries and play an important role in promoting wound healing. Especially with the rapid development of medical technology, the variety of wound dressings is diversified (Rohela *et al.*, 2016). Dragon Blood Capsule is a proprietary Chinese medicine that has effects of activating blood circulation to dissipate stasis, stopping pain and stopping bleeding and wound healing myogenic, which is often used for clinical treatment of blood stasis pain and abscess durable treatment work (Murata *et al.*, 2016). Previous studies have shown new wound dressings or dragon's blood capsule is applied to bedsore. However, there are few reports on the combination of two methods in the treatment of ulcer stage bedsore, which makes the research field still have some shortcomings. This study focused on the efficacy of these two methods in treatment of common ulcer bedsore in geriatrics department.

## MATERIALS AND METHODS

### General information

A total of 80 patients with ulcerative bedsore observed in our hospital department of Geriatrics were selected as cases from May 2016 to May 2017. They were randomly divided into the control group received Longxuejie

capsules and the study group received new wound dressing combined with Longxuejie. Each group had 40 cases. Inclusion criteria were: (1) geriatric diseases with age  $\geq 60$  years old (2) depth of wound did not affect bone and joints (3) stable vital signs (4) patients without coagulation dysfunction. Exclusion criteria were: (1) expected life cycle was less than the end of experiment; (2) disability in legal or spiritual sense; (3) patients and / or dependents did not agree with the research program. The general characteristics of patients between two groups did not differ significantly as shown in table 1 ( $P > 0.05$ ).

The two groups were treated for 4 weeks and received the same anti infection and nutritional support. The initial treatment steps of bedsore in ulcer stage were as follows: First of all, 0.9% Sodium Chloride Solution was used to rinse ulcer surface and remove purulent exudate on surface (Marquez-Lara *et al.*, 2017). Secondly, the control group took dragon blood capsule (Yunnan Yunhe Pharmaceutical Co., Ltd., MNPZ Z53020999) 4-6 grains/time, 3 times /d. The study group was treated with new wound dressing combined with dragon's blood capsule. Medication regimen of dragon's blood capsule was similar to that of the control group. The new wound dressing is used Kang Well foam dressings (Danish health care company, SFDA Certified No. (2013): 3640440). The side of the foam pad was facing upward with the method of pasting and the film was gradually torn until the dressing was adhered to wound surface completely. Dressing was replaced depending on how much exudate.

### Observation index

Total effective rate, laboratory index and degree of pain were selected as observation indexes. Laboratory indexes

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included hemoglobin, albumin and white blood cell count. The degree of pain was measured by visual analogue scale. Specific division criteria were as follows:  $\leq 3$  points as mild, 4-6 points as moderate,  $\geq 7$  points as severe (Sykes *et al.*, 2016).

#### **Evaluation standard**

According to the wound healing situation before and after treatment, the clinical efficacy of this study was determined as follows: Healing: all wounds healed; Markedly effective: Area of wound was reduced by 75%~99%; Effective: Wound area was reduced by 50%~75%; Ineffective: Area of wound was smaller than 50% before treatment. Total effective rate (%) = (healing + markedly effective + effective) / total number \*100%.

### **STATISTICAL ANALYSIS**

All statistical analyses were performed using SPSS 17.0 software. Measurement data were used ( $\bar{x} \pm s$ ) and tested by student's t-test. Quantitative data was analyzed by % and tested by  $\chi^2$ . Level data using Z test. A p-value of  $<0.05$  was considered statistically significant.

#### **Ethical consideration**

Institutional review board (IRB Log Number: 322-731) and considering the national regulations that govern the protection of human subjects.

### **RESULTS**

#### **Comparison of total effective rate in two groups**

The total effective rate was 95.00% in study group and 85.00% in control group given in table 2 ( $P<0.05$ ).

#### **Comparison of laboratory indexes**

Table (3) indicated that there was no significant difference in laboratory indexes between two groups before treatment ( $P>0.05$ ), but the difference was statistically significant after treatment ( $P<0.05$ ).

#### **Comparison of pain degree**

There was no significant difference in pain degree between two groups before treatment ( $P>0.05$ ), but the improvement effect of study group was better than that of control group after treatment shown in table 4 ( $P<0.05$ ).

### **DISCUSSION**

Geriatrics department is a specialized department in medical and health institutions for diagnosis and treatment of common and frequent diseases in the elderly aged 60 and over in China (Murata *et al.*, 2016). Geriatric patients are generally older and their body functions are generally declining. Due to decrease of exercise, long-term bedridden and other factors, the incidence of bed sores increases year by year. This not only has a serious

impact on the treatment of patients, but also aggravates the current tense opposition between doctors and patients, arousing widespread medical attention (Ahsan *et al.*, 2016). Ulcer stage bedsore refers to serious obstruction of venous blood flow, causing local tissue congestion. In condition of ischemia and hypoxia, the light is that superficial tissue is infected and pus flows out and forms ulcer surface, but in severe cases, necrotic tissue is discolored, purulent secretion is produced and accompanied by odor. The focus of infection extends to surrounding and depth, the deepest can reach to skeleton, and then induce septicemia (Chaykina *et al.*, 2016; Gregory *et al.*, 2016). As the disease is difficult to cure, over a long period of time, it is easy to lead to a series of complications, such as osteomyelitis, sepsis, hypoproteinemia, which gives a serious threat to patients' life safety (Alexander *et al.*, 2016; Christopher *et al.*, 2016). Up to now, bedsore in ulcer stage is still one of the important causes of death of paraplegic patients (Alexander *et al.*, 2016; Christopher *et al.*, 2016).

Dragon's blood capsule is a kind of pure Chinese medicine preparation, which is prepared from dragon's blood as the main raw material and processed by modern processing technology. Its active ingredient is dragon's blood saponin and plant defensins. The former has the effect of promoting blood circulation to dissipate blood stasis, removing necrotic muscles and stopping pain. While the latter can heal wound, after entering the body, the latter can remove cold product, heat accumulation, qi-product, blood stasis and other toxins of the inner body (Hunter *et al.*, 2017). The occurrence and development of bedsore in TCM theory were caused by deficiency of qi and blood, qi stagnation and blood stasis and muscular and skeletal dystrophy. The main treatment of bedsore of traditional Chinese medicine is to dredge channels and collaterals, remove necrotic muscles, invigorate circulation of blood and remove stasis (Jason *et al.*, 2017). Pharmacological effect of dragon's blood capsule is in line with the principle of treatment. Furthermore, wound dressing is an important treatment in western medicine. The new wound dressing used in this study is a highly absorbable dressing. It consists of a layer of hydrocolloid suitable for sticking to skins, a central absorbent foam pad and a layer of half body waterproofing membrane, which can provide a moist healing environment for wound surface. It can dissolve necrotic tissue on wound surface by using the high water force of debridement glue and promote growth of granulation to provide support for deep wounds. While the ulcer absorbs exudate from wound and forms a gel, which provides a moist closed environment for wound, blocks invasion of pathogenic bacteria, and provides a strong guarantee for accelerating wound healing (Donna *et al.*, 2017). Therefore, combined use of the two can give full play to advantages of different mechanisms of treatment, to achieve the purpose of curing ulcers bedsore completely.

**Table 1:** Comparison of general data between two groups (n=40)

Group	Gender [N(%)]		Average age ( $\bar{x} \pm s$ , year)	Primary disease types [n(%)]					Disease duration( $\bar{x} \pm s$ , d)	Wound site [n(%)]			Mean bed sore area( $\bar{x} \pm s$ , cm <sup>2</sup> )
	Male	Female		Cerebral apoplexy	Acute myocardial infarction	Pulmonary heart disease	Fracture	Paraplegia caused by trauma		Sacroiliac	Back	Elbow joint	
Control	29 (72.5)	11 (27.5)	75.10 $\pm 1.11$	15 (37.5)	11 (27.5)	8 (20)	4 (10)	2 (5)	7.89 $\pm 1.01$	26 (65)	9 (22.5)	5 (12.5)	14.22 $\pm 1.11$
Study	30 (75)	10 (25)	75.12 $\pm 1.10$	16(40)	10(25)	7 (17.5)	4 (10)	3 (7.5)	7.85± 1.00	25 (62.5)	9 (22.5)	6 (15)	14.20 $\pm 1.15$
$\chi^2/t$	0.161		1.002	0.132					1.005	0.135			1.002
P	0.688		0.998	0.717					0.994	0.713			0.998

**Table 2:** Comparison of total effective rate in two groups [n (%)](n=40)

Group	Healing	Markedly effective	Effective	Ineffective	Total effective rate (%)
Control	10 (25.00)	14 (35.00)	10 (25.00)	6 (15.00)	85.00
Study	15 (37.50)	17 (42.50)	6 (15.00)	2 (5.00)	95.00
Z	-4.500				
P	0.034				

**Table 3:** Comparison of laboratory indexes in two groups ( $\bar{x} \pm s$ ) (n=40)

Group	Hemoglobin (g/L)		Albumin (g/L)		Leucocyte count ( $\times 10^9/L$ )	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Control	7.35±1.11	8.55±1.05	1.94±0.26	4.12±0.27	18.74±1.26	12.64±1.35
Study	7.37±1.10	10.84±1.06	1.92±0.28	6.54±0.29	18.75±1.25	8.96±1.34
t	1.002	8.235	1.002	8.238	1.001	8.243
P	0.998	0.040	0.998	0.039	0.999	0.037

**Table 4:** Comparison of pain degree in two groups [n (%)] (n=40)

Group	Before treatment			After treatment		
	Mild	Moderate	Severe	Mild	Moderate	Severe
Control	0 (0.00)	27 (67.50)	13 (32.50)	25 (62.50)	14 (35.00)	1 (2.50)
Study	1 (2.50)	27 (67.50)	12 (30.00)	33 (82.50)	7 (17.50)	0(0.00)
Z	-0.052			-7.031		
P	0.819			0.008		

The total effective rate was 95.00% in study group and 85.00% in control group ( $P < 0.05$ ). There was no significant difference in laboratory indexes and pain degree between two groups before treatment ( $P > 0.05$ ), but the difference was statistically significant after treatment ( $P < 0.05$ ). The results showed that new wound dressing combined with dragon's blood capsule had better curative effect and relieved pain degree more obviously in treatment of bed sore in ulcer stage of geriatrics department. The reason is that the external application of new wound dressing helps to reduce impregnation of wounds and promotes cell metabolism to be best in

relatively closed environment, thus accelerating healing of wounds. Meanwhile, the oral preparation of Chinese patent medicine can achieve purpose of removing saprophytic muscle and repairing ulcer wound rapidly. Under the different action mechanism, combination of the two will undoubtedly help to further strengthen clinical treatment effect. However, it should be noted that in addition to aggressive drug treatment, daily life care needs to be strengthened in patients with geriatric diseases and the long-term pressure on local organizations should be lifted so as to prompt the healing of wounds as soon as possible (Bronst et al., 2017).

## CONCLUSION

In conclusion, new wound dressing combined with dragon blood capsule in treatment of bedsore in the elderly ulcers can achieve ideal clinical efficacy and effectively relieve the pain degree of patients, which can be used as the preferred treatment program.

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