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Traditional Chinese medicine combined with recombinant interferon to alleviate symptoms of COVID-19 infectious pneumonia

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Abstract

Objectives: Collect and analyze the basic information, symptoms, therapeutic method and therapeutic effect of novel coronavirus (COVID-19) infected pneumonia patients in the hospital in northern Henan Province from January 2020 to April 2020, to provide evidences for prevention and treatment of COVID-19 infectious pneumonia. **Methods:** The information of patients of COVID-19 infectious pneumonia in the hospital were collected and analyzed, including the admission time, the discharge time, therapeutic method, and therapeutic effect after treatment. **Results:** A total of 10 cases patients of COVID-19 infectious pneumonia were collected, there were 5 male patients and 5 female patients, the age ranged from 16-54 years old and the average age was 34.2 years old; the body temperature of 6 cases patients were higher than 37°C when they were admitted to hospital; CT results showed that all the patients had infectious lesions of both lungs, and the results of nucleic acid test were positive. 5 million (aerosol inhalation) recombinant interferon (Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol) combined with

traditional Chinese medicine could alleviate effectively symptoms of COVID-19 infectious pneumonia within a month, the body temperature of patients returned to normal, respiratory symptoms improved significantly, COVID-19 nucleic acid test was negative, and results of lung imaging was also normal. **Conclusion:** Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol combined with Traditional Chinese medicine has a good effect on relieving the symptoms of COVID-19 infected pneumonia and has significance for clinical treatment or clinic remission of COVID-19 infectious pneumonia.

Keywords: COVID-19; recombinant interferon; Traditional Chinese medicine; Lopinavir/Ritonavir.

1. Introduction

COVID-19 infectious pneumonia has been rapidly spread from Wuhan city to the whole China and to every corner of the world since it was discovered in Wuhan from December 2019. So far, it has mutated several times, which has seriously affected the daily life and health of people in the world, and the number of infections has reached the highest in history^[1, 2]. COVID-19 infectious pneumonia is characterized by high pathogenicity, spreads rapidly and is prone to mutation. The infected patients often have higher body temperature, fever, dry cough, fatigue; CT results show pulmonary infectious lesions and the results of nucleic acid tests are positive^[3, 4, 5, 6]. So far, there is no ideal therapeutic methods for COVID-19 infectious pneumonia treatment.

The clinical drugs of COVID-19 infectious pneumonia have been reported mainly include protease inhibitors (ritonavir, oseltamivir, darunavir, and lopinavir)^[7,8], RNA-dependent RNA polymerase^[9, 10, 11, 12], these drugs have various side effects in the treatment of COVID-19 patients^[13], or the therapeutic effect is poor when used alone or in combination with two kind of different drugs^[14]. For this purpose, This article provided a novel treatment through summarizing the data of 10 COVID-19 patients who came to our hospital in North Henan Province,

collecting and analyzing the basic information and clinical treatment, and found that when using Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol interferon, combination of traditional Chinese medicine had better therapeutic effect in the treatment of COVID-19 infectious pneumonia.

2. General information of patients

A total of 10 effective COVID-19 patients were collected in this report. There were 5 males and 5 females, aged from 16-54 years old, and the average age was 34.2 years old; there were 8 cases of patients with Wuhan contact history, after using Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol interferon, combination of Chinese traditional medicine, the symptoms of COVID-19 infectious pneumonia disappeared within one month, the detail showed at Table 1.

Table 1. Summary the basic information of 10 cases of COVID-19 patients in North Henan Province

Patients	Gender	Age	Is there any contact history in Wuhan	Admission time	Discharge time	Treatment period
1	Male	25	Yes	01.27.2020	02.16.2020	17 days
2	Female	54	Yes	02.08.2020	02.29.2020	21 days
3	Female	16	Yes	01.26.2020	02.12. 2020	15 days
4	Male	32	Unknown	02.06.2020	02.26.2020	20 days
5	Male	54	Yes	02.08.2020	02.29.2020	21 days
6	Male	34	No(Shanghai)	02.01.2020	02.19.2020	18 days
7	Male	31	Yes	02.07.2020	02.26.2020	19 days

8	Female	42	Yes	01.25.2020	02.10.2020	14 days
9	Female	23	Yes	02.09.2020	02.28.2020	19 days
10	Female	31	Yes	02.06.2020	02.28.2020	22 days

3. Therapeutic method

10 cases of COVID-19 infectious pneumonia patients were treated with Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol combined with traditional Chinese medicine to relieve symptoms. The main treatment process was to inject 5 million units of r Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol to inhibit COVID-19 virus, combined with various traditional Chinese medicines to improve the immunity of COVID-19 patients or relieve the symptoms of COVID-19 patients, and every patient had different kinds of traditional Chinese medicines for use (Table 2).

Table 2. Summary of treatment methods for 10 cases of COVID-19 patients in North Henan Province

Patients	Recombinant interferon	Traditional Chinese medicine
1	Lopinavir/Ritonavir	Raw honeysuckle, Forsythia, Platycodon grandiflorum, Bamboo shavings, White peony, Mulberry leaf, Chrysanthemum, Platycodon grandiflorum, Licorice, Forsythia, Atractylodes rhizome, Earthworm, Amomum villosum, Ophiopogon japonicus, Fried hawthorn, Poria cocos and Ginger
2	Lopinavir/Ritonavir	Cinnamon alisma orientalis, Poria cocos, Atractylodes macrocephala, Ginger, Pinellia, Magnolia obavata, Fried almond, Cangerine peel, Patchouli, Grass fruit,

		Atractylodes macrocephala, Platycodon grandiflorum, Fried Scutellaria and Forsythia suspensa
3	Lopinavir/Ritonavir	Rhizoma atractylodis, Honeysuckle, Mint, Scutellaria baicalensis, Patchouli, Poria cocos, Coptis chinensis, Grass fruit, Licorice and Amomum villosum
4	Lopinavir/Ritonavir/Abidol	Scutellaria baicalensis, Coptis chinensis, Forsythia suspensa, Honeysuckle, Yunling, Huoxiang, Perilla, Alisma tulip, Stemona root, Almond, Hemp, Perilla, Chaihu, Guanzhong, Gypsum, Honeysuckle, Sea cucumber, astragalus, Radix scrophulariae, Licorice
5	Lopinavir/Ritonavir/Abidol	Fried Scutellaria, Almond, Atractylodes macrocephala, Yunling, Mulberry leaves, Stemona root, Astragalus root, Angelica root, Notopterygium root, Licorice root, Scutellaria root, Forsythia root, Honeysuckle, Alisma orientalis, Sea cucumber, Astragalus root, Yujin, Radix scrophulariae and Licorice root
6	Lopinavir/Ritonavir	Raw honeysuckle, Scutellaria baicalensis, Peppermint, Mulberry leaf, Trichosanthin, Pinellia ternata, Ginger, Scutellaria baicalensis, Honeysuckle, Platycodon grandiflorum, Forsythia perforatum, Mulberry, White peel, Almond,

		Stemona, Red patchouli, Grass fruit, Tulip, Bombyx mori, Perilla, Scorched hawthorn, Licorice, Ginger
7	Lopinavir/Ritonavir/Abidol	/
8	Lopinavir/Ritonavir/Abidol	Radix rehmanniae, Poria cocos, Honeysuckle, Scutellaria and Atractylodes
9	Lopinavir/Ritonavir/Abidol	Scutellaria, Honeysuckle, Forsythia, Hypericum, Radix Scrophulariae, Rhizoma Coptidis, Radix Pseudostellariae, Licorice and Hawthorn
10	Lopinavir/Ritonavir/Abidol	Maxing Shigan Decoction and Xiaochaihu Decoction

4. Therapeutic effect

10 cases of COVID-19 infectious pneumonia patients were treated with Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol combined with Traditional Chinese medicine. fever and basic symptoms of COVID-19 infectious pneumonia disappeared, the body temperature returned to normal, CT results was normal, and nucleic acid detection was negative for two times, but detection of WBC (white blood cell), RBC (Red blood cell), Hemoglobin (HGB) and platelet (PLT) were no obvious changes before treatment and after treatment (Table 3).

Table 3. Comparison of symptoms of 10 cases of New COVID-19 infected pneumonia patients before and after treatment

case	Body temperature	Symptom	CT detection	WBC	RBC	HGB	PLT	Nucleic acid test
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1	Before treatment	37.2°C	Fever with retching for 2 days	Obsolete lesions of upper lobes in both lungs	4.64×10 ⁹ /L (N: 3.15×10 ⁹ /L, L:1.02×10 ⁹ /L, N: 67.9%, L: 22%)	5.21×10 ¹² /L	130g/L	176×10 ⁹ /L	Positive
	After treatment	Normal	Symptom disappeared	No obvious abnormality	5.49×10 ⁹ /L (N: 3.18×10 ⁹ /L; L:1.91×10 ⁹ /L; N:58%, L:34.8%)	4.91×10 ¹² /L	145g/L	204×10 ⁹ /L	Negative
2	Before treatment	37.1°C	Cough and sputum, fever	Infectious lesions of both lungs	5.0×10 ⁹ /L (N: 32.97×10 ⁹ /L, L:1.81×10 ⁹ /L, N: 59.4%, L: 36.2%)	4.39×10 ¹² /L	Unknown	Unknown	Positive
	After treatment	Normal	Respiratory symptoms disappeared	No obvious abnormality	3.73×10 ⁹ /L (N: 1.78×10 ⁹ /L, L:1.64×10 ⁹ /L; N: 47.8% L: 44%)	3.75×10 ¹² /L	122g/L	159×10 ⁹ /L	Negative
3	Before treatment	37.6°C	Headache and fever	Infectious lesion of right lower lobe of lung	3.59×10 ⁹ /L (N: 1.6×10 ⁹ /L, L: 1.59×10 ⁹ /L; N: 46.83% L: 44.83%)	4.67×10 ¹² /L	133g/L	212×10 ⁹ /L	Positive
	After treatment	Normal	Symptom disappeared	No obvious abnormality	4.07×10 ⁹ /L (N: 1.61×10 ⁹ /L, L: 2.11×10 ⁹ /L; N: 39.7% L: 52%)	4.98×10 ¹² /L	147g/L	238×10 ⁹ /L	Negative
4	Before treatment	37.3°C	Cough and sputum, fever	Infectious lesions of both lungs	4.52×10 ⁹ /L (N: 2.11×10 ⁹ /L, L: 1.8×10 ⁹ /L; N: 46.7% L: 39.9%)	5.03×10 ¹² /L	/	176×10 ⁹ /L	Positive

5	After treatment	Normal	Symptom disappeared	The pulmonary lesions were slightly absorbed than before	4.07×10 ⁹ /L (N: 1.61×10 ⁹ /L L: 2.11×10 ⁹ /L; N: 39.7%, L: 52%)	4.98×10 ¹² /L	147g/L	238×10 ⁹ /L	Negative
	Before treatment	Normal	No symptom	Infectious lesions of both lungs	7.88×10 ⁹ /L (N: 6.42×10 ⁹ /L, L: 1.11×10 ⁹ /L, N: 81.4% L:14.2%)	5.28×10 ¹² /L	/	183×10 ⁹ /L	Positive
	After treatment	Normal	No symptom	The pulmonary lesions were slightly absorbed than before	3.75×10 ⁹ /L (N: 2.2×10 ⁹ /L, L:1.164×10 ⁹ /L; N: 59% L: 31%)	5.15×10 ¹² /L	149g/L	154×10 ⁹ /L	Negative
6	Before treatment	38°C	Fever, cough with a small amount of white phlegm	Infectious lesions of both lungs	6.98×10 ⁹ /L (N: 4.36×10 ⁹ /L, N: 62.4%, L: 27.7%)	5.31×10 ¹² /L	153g/L	177×10 ⁹ /L	Positive
	After treatment	Normal	Symptom disappeared	No obvious abnormality	6.25×10 ⁹ /L (N: 3.98×10 ⁹ /L, L: 1.42×10 ⁹ /L; N: 63.7%, L: 22.8%)	4.72×10 ¹² /L	132g/L	268×10 ⁹ /L	Negative
7	Before treatment	36°C	Fever	Patchy shadow of right upper lung and lower lobe of both lungs	3.28×10 ⁹ /L (N: 1.40×10 ⁹ /L, L: 1.59×10 ⁹ /L; N: 42.72%, L: 48.47%)	5.30×10 ¹² /L	155g/L	107×10 ⁹ /L	Positive
	After treatment	Normal	Symptom disappeared	No obvious abnormality	6.28×10 ⁹ /L (N: 3.30×10 ⁹ /L, L: 2.52×10 ⁹ /L; N: 52.6%)	5.16×10 ¹² /L	152g/L	195×10 ⁹ /L	Negative

					L: 40.2%)					
8	Before treatment	38.1°C	Cough and sputum, fever	Infectious lesions of both lungs	3.7×10 ⁹ /L (N: 2.51×10 ⁹ /L, L: 0.94×10 ⁹ /L; N: 67.8%, L: 25.6%)	4.03×10 ¹² /L	122g/L	166×10 ⁹ /L	Positive	
	After treatment	Normal	Symptom disappeared	No obvious abnormality	5.23×10 ⁹ /L (N: 2.84×10 ⁹ /L, L:1.91×10 ⁹ /L; N:54.3%, L:36.6%)	3.9×10 ¹² /L	118g/L	338×10 ⁹ /L	Negative	
9	Before treatment	/	Cough, fatigue and poor appetite	Infectious lesions of lower lobes of both lungs	3.93×10 ⁹ /L (N: 1.29×10 ⁹ /L, L: 2.24×10 ⁹ /L; N: 33.0%, L: 56.6%)	4.37×10 ¹² /L	130g/L	255×10 ⁹ /L	Positive	
	After treatment	Normal	Symptom disappeared	No obvious abnormality	4.9×10 ⁹ /L (N: 2.34×10 ⁹ /L, L: 2.08×10 ⁹ /L; N: 47.8%, L: 42.6%)	3.87×10 ¹² /L	121g/L	289×10 ⁹ /L	Negative	
10	Before treatment	38.6°C	Fever	Infectious lesion of right lower lobe of lung	4.39×10 ⁹ /L (N: 2.41×10 ⁹ /L, L: 1.68×10 ⁹ /L; N: 54.89%, L:38.4%)	4.12×10 ¹² /L	121g/L	190×10 ⁹ /L	Positive	
	After treatment	Normal	Symptom disappeared	No obvious abnormality	8.27×10 ⁹ /L (N: 4.93×10 ⁹ /L, L: 2.72×10 ⁹ /L; N: 59.6%, L:32.89%)	4.44×10 ¹² /L	125g/L	512×10 ⁹ /L	Negative	

5. Discussion

This article collected and analyzed 10 cases of COVID-19 infectious pneumonia patients in North Henan Province. The basic information and therapeutic effect before and after treatment were sorted and analyzed. It was found that Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol combined with Traditional Chinese medicine could eliminate symptoms of COVID-19 infected pneumonia in a shorter time, and nucleic acid detection is negative, which has good clinical significance.

We found a 16-year-old COVID-19 infectious pneumonia patients, which was youngest patient in this investigation. After Lopinavir/Ritonavir combined with Traditional Chinese medicine (Rhizoma atractylodis, Honeysuckle, Mint, Scutellaria baicalensis, Patchouli, Poria cocos, Coptis chinensis, Grass fruit, Licorice and Amomum villosum) treatment, the symptoms disappeared and nucleic acid test was negative within 15 days. Those data may provide a reference treatment for teenagers because of particularity of population.

It should be noted that Lopinavir/Ritonavir or Lopinavir/Ritonavir/Abidol combined with traditional Chinese medicine can eliminate symptoms of COVID-19 infected pneumonia and negative nucleic acid test. However, there are no significant changes in WBC, RBC, HGB and PLT before and after treatment. Therefore, WBC, RBC, HGB and PLT cannot not be used as a clinical index for COVID-19 infectious pneumonia. On the contrary, fever, CT detection and nucleic acid changed significantly before and after treatment, which has good clinical guiding significance.

The limitation of this article: 1. the patients in this investigation were few, and most of them come from northern Henan Province; 2. there are many kinds of traditional Chinese medicine used, so it is difficult to define which traditional Chinese medicine components work and how to

work.

6 Conflict of interests

The authors declare that they have no competing interests in this article.

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