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Study on the effect of tonifying kidney and promoting blood flow on pulmonary function and morphology in rats with pulmonary fibrosis

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Abstract: 60 Wistar rats were divided into normal group, model group, Chinese medicine group, the hormone group. Which traditional Chinese medicine (Method of tonifying kidney and activating blood circulation) group of oral Chemical fiber capsule; hormone group oral prednisone, course of treatment for 28d, 7d, 14d, 28d respectively in the rats were sacrificed, underwent pulmonary function test, the Chemical fiber capsule after treatment, in rats with pulmonary fibrosis, animal general status and pulmonary function showed marked improvement, Chemical fiber capsule treatment of pulmonary fibrosis with satisfactory results.

Key words: tonifying kidney ;activating blood circulation;pulmonary fibrosis; pulmonary function; morphology

Interstitial fibrosis of the lung is difficult to treat respiratory system. In recent years, there are increasing incidence of pulmonary interstitial fibrosis, at present there is no satisfactory treatment method. This study was designed to investigate the effects of Chemical fiber capsule on the general state of lung function and pulmonary fibrosis in rats, to explore the mechanism of Chemical fiber capsule on rat model of pulmonary fibrosis.

1 Experimental materials

1.1 animal Male Wistar rats, weighing (200 ± 20) g, provided by experimental animal center of Heilongjiang University Of Chinese Medicine, keeping clean grade standard.

1.2 drugs Chemical fiber capsule: 10g/ particle, Production from the First Affiliated Hospital of Heilongjiang University Of Chinese Medicine. Main components made of 16 kinds of Chinese medicine by Radix Codonopsis, Radix Pseudostellariae, astragalus, radix, Ophiopogon, Salvia miltiorrhiza, angelica, Gekko gekko and so on..

Prednisone: 5mg/tablet, Harbin biochemical pharmaceutical company limited, lot number 010608. Bleomycin: a 8mg, Harbin Pharmaceutical Company Limited Pingyang mycin, lot number 970403.

1.3 instrument Precision electronic balance: Shanghai balance instrument factory; electric steam sterilizer: Shanghai medical instrument factory; the constant temperature water bath box: Beijing seven medical equipment factory; 721 spectrophotometer, high speed centrifuge: third analytical instrument factory in Shanghai; optical microscopy: Japan OLYMPUS company; automatic paraffin section machine: British SHANON company; digital cameras: Sony Corp of Japan; image analysis system: the United States of America Pharmacia company.

2 experimental method

In 60 Wistar rats after 3d made of conventional breeding, interstitial pulmonary fibrosis model and randomly divided into 4 groups: normal group, model group, Chinese medicine group, the hormone group, 15 rats in each group, model group, Chinese medicine group, prednisone group of intratracheal injection of bleomycin 2d model group, the daily given physiological salt water by gavage, 1mg/100g traditional Chinese medicine group, give Chemical fiber capsule gavage, 1ml/

100g every time, 2 times a day, the hormone group daily prednisone gavage, 10.1mg/100mg. Animal in 1, 2, 4W.

3 observation index

The general state of the rat, observe the rats in each group active hair gloss, eating, drinking, and body weight changes, breathing and lung coefficient, pulmonary function test.

4 The experimental results

4.1 General state of animals Normal rats were lively, strong and stout, shiny shiny fur, gradual increase in body weight, breathing steadily; model group lassitude, slow extrados curled up and withered fur, dull, common inverted vertical phenomenon, the body than other group weight loss, shortness of breath. Chemical fiber capsule group fur is acceptable, physically strong, diet is acceptable. Prednisone group late skin dryness, lazy move, diet to reduce the phenomenon, not as good as the early state. Animal weight changes, the results show that each point in time model group of animal body weight were significantly lower than the normal group, the difference was significant, $P < 0.01$; animal weight gain after Chemical fiber capsule and prednisone therapy, and Chemical fiber capsule increase; 28d The Chemical fiber capsule group weight is higher than the model group, compared to the treatment group and the model group were significantly different, $P < 0.01$. Chemical fiber capsule group weight than prednisone group, the difference was significant, $P < 0.05$.

Each animal body weight change in table 1.

Table 1 Rats in each group weight ($\bar{x} \pm s, n=5$)

Weight(g) Group	n			
		7d	14d	28d
Normal	5	211.5±10.6	232.3±8.2	258.0±9.6
Model	5	191.0±6.7**	210.1±12.4**	188.0±6.2**
Hormone	5	195.1±12.3*	214.0±7.6*	224.1±10.4**
Chinese Medicine	5	197.5±7.4	224.9±11.8	242.2±13.5##

Note: * $P < 0.05$ compared with N; ** $P < 0.01$ compared with N

$P < 0.05$ compared with B; ## $P < 0.01$ compared with B

4.2 Lung coefficient The highest lung coefficient of the model group, 14d, 28d reduce; the hormone group 7d highest, 28d minimized; Medicines Board at 14d, 28d declined; model group of three time points, the hormone group and the Medicines lung coefficient higher than normal group, the difference was significant, $P < 0.01$. 7d, 14d lung coefficient of hormone group and Chinese medicine group were significantly lower than the model group, significant differences, $P < 0.05$; 28d lung coefficient of the hormone group and Chinese medicine group were significantly lower than the model group, the difference was significant, $P < 0.01$.

Animals lung coefficient changes are shown in Table 2.

Table 2 Lung coefficient of rats in each group at each time point comparison (mg/g) ($\bar{x} \pm sn=5$)

Lung indes(mg/g) Group	n			
		7d	14d	28d
Normal	5	5.32±0.54	5.50±0.36	5.47±0.11
Model	5	9.43±0.40**	9.78±1.05**	8.82±0.65**
Hormone	5	8.64±0.43*##	8.20±0.84*##	6.96±0.52*##

Chinese
Medicine 5 8.59±0.60^{* **} 8.35±1.01^{* **} 6.77±0.62^{* **}

Not: * P<0.05 compared with N; * * P<0.01 compared with N

4.3 Lung function Pulmonary fibrosis model rats lung function indicators have changed, MVV, FVC and PEF was significantly lower than the normal group, both compared to the presence of a significant difference, P <0.05; FEV0.3 % and FVC % normal or elevated. Chemical fiber capsule after treatment, lung function indicators improved compared with the model group was significantly different, P <0.05.

Table 3 Rats in each group at each time point in lung function compare ($\bar{x} \pm s, n=5$)

Group	Day	MVV	FVC	FVE0.3/FVC%	PEF
Normal	1W	139.80±8.06	7.54±0.95	72.04±1.81	24.74±6.20
	2W	140.72±5.93	7.51±0.82	70.21±4.16	20.42±5.57
	4W	138.67±7.20	7.63±0.67	71.23±1.80	25.75±1.69
Model	1W	123.0±8.43 [*]	6.41±0.65 [*]	74.52±3.22	15.31±4.23 [*]
	2W	120.86±6.20 ^{* **}	6.20±0.67 [*]	76.57±3.23 [*]	17.87±3.43 [*]
	4W	118.03±3.82	6.23±0.24 ^{* **}	79.32±2.45 ^{* **}	20.30±1.32 ^{* **}
Hormone	1W	126.74±8.41	6.43±0.74	70.94±2.62	18.84±5.56
	2W	129.78±5.68 ^{* **}	6.74±0.74	71.94±4.96	21.8±4.52
	4W	131.98±8.40 ^{##}	6.98±0.38 [#]	74.23±0.89 ^{* **}	23.08±1.39 ^{* **}
Chinese Medicine	1W	126.63±10.68	6.37±0.39	73.18±3.40	18.41±5.56
	2W	130.66±4.54 ^{* **}	6.58±0.80	74.21±4.69	21.40±6.68
	4W	133.57±6.52 ^{##}	6.89±0.48	75.89±2.04 ^{* **}	22.82±1.47 ^{* **}

Not: * P<0.05 compared with N * * P<0.01 compared with N

P<0.05 compared with B ## P<0.01 compared with B

5 Discussion

Belong to the clinically used antitumor antibiotic bleomycin (BLM), its main side effect is pulmonary toxicity, causing alveolitis and quickly progress to pulmonary fibrosis, the BLM-induced rat model of pulmonary fibrosis has become today's international studies of pulmonary fibrosis commonly used experimental method^[1]. The experimental observation, after intratracheal drops Rubo Lai neomycin, have different levels of towering hair, listlessness, reduced activity. From model Rat symptoms, signs performance look 1W shortness of breath, body weight decreased significantly, compared with the normal group exist significant differences, P <0.01. Tide over this period, these phenomena began to ease the weight gain. 3W rats activities and improve their ability to ease breathing difficulties than before also. Weight, Chemical fiber capsule treatment group rapid weight gain, 28d, close to the normal control group, model group, body weight decreased significantly, and there are significant differences of the normal group, P <0.01. Animal weight after prednisone treatment has also been restored, but later was significantly lower than that in the normal control group, P <0.01. Chemical fiber capsule has a protective effect on the body system organ damage caused by the BLM and general functional status damage prednisone can play a therapeutic role, but due to their endocrine system can, the immune system is suppressed, the clinical application is limited. The lung index reflects one of the indicators of the degree of pulmonary fibrosis, pulmonary index level is closely related with lung weight^[2]. During the formation of pulmonary fibrosis, inflammatory exudate, cell swelling, capillary congestion and

other factors caused by the increase in lung weight , is the direct cause of the elevated lung index . Experimental observations , the model rats lung index 14d , 28d reduce still significantly higher than the normal group , a significant difference , $P < 0.01$. Chemical fiber capsule after treatment 7d ~ 28d lung index decreased significantly compared with the model group differences , $P < 0.01$. That the Chemical fiber capsule in the early and late stages of pulmonary fibrosis inhibited index increased , Chemical fiber capsule pulmonary inflammatory infiltration and edema , fibrosis also lessens . Because interstitial lung existence a large number of fibroblasts , a restrictive ventilatory defect , showed vital capacity , total lung capacity decreased 1S forced expiratory volume percentage of normal or increased lung capacity^[3,4] . MVV (maximum voluntary ventilation) is the maximum respiration per unit of time , which reflects the respiratory dynamic function is to determine the ventilation function in more meaningful an indicator ; FVC (forced vital capacity) for the fastest deep inspiration the exhaled gas , is closely related with the MVV , MVV, FVC decreased pulmonary fibrosis . The experimental results show that the indicators of pulmonary fibrosis in rat lung function compared with normal group there are significant differences , which MVV, FVC comparison with the same period in the normal group ($P < 0.05$ or $P < 0.01$) . 0.3s forced expiratory volume in FVC ratio , 7d with the normal group no difference , 14d, 28d is significantly higher , and there are significant differences of the normal group , $P < 0.05$. This prompted restrictive ventilatory dysfunction similar to human pulmonary fibrosis in rats lung function changes .The kidney and activating circulation method (chemical fiber capsule)after treatment , lung function indicators improved markedly significant difference compared with the model group , $P < 0.05$ or $P < 0.01$, The kidney and activating circulation method (chemical fiber capsule) can effectively improve the abnormal lung function after lung fibrosis , indicating that the kidney and activating circulation method in the treatment of pulmonary fibrosis technology played a benefit lung qi essentially proceed adjustment lung qi of the body from the state , thereby assisting role^[5] righteousness . The treatment is followed this principle to cure the disease , and therefore obtain a better therapeutic effect .

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Progress In Etiology Of Ectopic Pregnancy

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Abstracts: In recent years, the rate of EP increases and the domestic and foreign reports vary widely with the rate in foreign literature 1 : 50 ~ 1 : 303 and the rate in domestic literature 1 : 43 ~ 1 : 50^[1]. With the determination the high sensitivity of HCG and the clinical applications