Glutathione, Lumbrokinase Combination Therapy for Chronic Pulmonary Heart Disease

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Pulmonary heart disease is a common disease, which involves the respiratory and circulatory systems. The increase in pulmonary vascular resistance results in pulmonary hypertension, with eventual structural and functional changes in the right ventricle. Exacerbations can happen frequently in this condition and treatment results are often suboptimal. Our department used a combination therapy of glutathione and lumbrokinase to treat 32 cases of chronic pulmonary heart disease (CPHD) between December 2006 and January 2008, and the results were quite satisfactory.

1. MATERIAL & MEHTOD

1.1 General Information 64 hospitalized patients meeting the 1997 CPHD diagnostic criteria of the China Medical Association (between December 2006 and January 2008) were randomly assigned into two groups. Treatment group info: 32 patients; 18 males, 14 females; age 40-78 years, average age (58.6 ± 8.7) years; duration of illness 4-18 years. Control group info: 32 patients; 16 males, 16 females; age 50-76 years, average age (59.6 ± 9.3) years; duration of illness 3-22 years. All patients had the following symptoms at admission: recurrent cough, phlegm, stuffy chest, shortness of breath, many years of palpitation, abdomen distention, lower limb edema, different degrees of cyanosis, jugular venous distention, and audible arrhythmia or heart murmur; some patients also had apathy, absent-mindedness, delirium, etc which indicated the presence of pulmonary encephalopathy.

1.2 Treatment Control group received conventional treatment including anti-bacterial, anti-asthmatic, anti-cough, phlegm-reducing, heart-strengthening, and diuretic medications as indicated; electrolyte imbalance was corrected if present. In addition to the conventional treatment (as mentioned above for the control group), the treatment group received intravenous glutathione 0.6-1.2g once daily and lumbrokinase 600000U, three times daily.

1.3 Evaluation *Markedly effective*: under normal condition slightly or no breathing difficulties; disappearance of lip cyanosis; disappearance or reduction of pulmonary rales; and disappearance or reduction in jugular venous distention, hepatomegaly, liver tenderness and lower limb edema related to circulatory congestion. *Effective*: decreased in breathing difficulties; reduction of lip cyanosis; less pulmonary rales and signs of circulatory congestion. *Non-response*: no changes in signs and symptoms. [1]

1.4 Statistic Analysis Rank-sum test was used for statistical analysis.

2. RESULTS

The overall effective rate of the treatment group was 84.4% and that of the control group was 62.5%; the difference was significant ($P<0.05$), see table 1.

Table 1 comparison of treatment results between the two groups

Groups	N=	Markedly Effective	Effective	Non-Response	Overall Effective Rate (%)
Treatment	32	17	10	5	84.4
Control	32	12	8	12	62.5

*note: rank-sum test: $\mu_c = 3.65$, $P<0.05$

3. DISCUSSIONS

Glutathione (GSH) is a tripeptide, composed of glutamic acid, cysteine and lysine and is involved in tricarboxylic acid cycle and sugar metabolism. It protects cells from reactive oxygen species and lipid peroxides; thus, prevents cell damage and promotes normal cell protein synthesis [2]. It is well recognized that excessive free radicals in the lungs and a decreased antioxidant defense can cause lung damages. Chronic pulmonary heart disease (DPHD) patients have elevated serum MDA (malondialdehyde) levels, lower serum levels of VE (vitamin E) and SOD (superoxide dismutase), and lower whole blood levels of GSH-PX (Glutathione peroxidase) and Se (Selenium); such derangement in free radical metabolism plays an important role in the development of CPHD. [3] Glutathione neutralizes free radicals to prevent lung damage and promote restoration of lung function.

Lumbrokinase is a multi-protein extract from earthworms, and has the following functions: 1. direct degradation of fibrin and fibrinogen. 2. indirect activation of plasminogen into plasmin. 3. stimulation of t-PA release from vascular endothelial cells. 4. partial inhibition of coagulation pathways, hydrolization of coagulation factors and inhibition of platelet aggregation. Animal and clinical studies have shown lumbrokinase to have fibrinolytic, anticoagulant, and thrombolytic effects and it improves rheological parameters. [4] In general CPHD patients have hypercoagulable blood and often have pulmonary micro-embolism. Lumbrokinase can normalize blood coagulation rate and blood viscosity, inhibit platelet aggregation, and degrade fibrinogen, and resolve micro-thrombi in pulmonary capilaries. Thus, in CPHD patients, lumbrokinase can improve hyper-viscosity, decrease vascular resistance, and reduce pulmonary artery pressure, resulting in improvement of the right ventricular functions. [5]

In summary, treating CPHD patients with glutathione and lumbrokinase combination therapy helps to neutralize free radicals, protect lung parenchyma, reduce blood viscosity, dissolve pulmonary micro-thrombi, and reduce vascular resistance and pulmonary artery pressure, thus improving symptoms and overall health of pulmonary heart disease patients.

4. REFERENCE

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