The Effect of Lumbrokinase on Blood Lipid and Hemorheology in Patients with Hyperlipidemia

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[ABSTRACT] OBJECTIVE: To investigate the effect of lumbrokinase on blood lipids and hemorheology in patients with hyperlipidemia. METHODS: 46 subjects (outpatients and inpatients) meeting the diagnostic criteria of primary hyperlipidemia were selected from Luzhou Medical College Affiliated Chinese Medicine Hospital. They were randomly assigned into control group (n = 23) and Lumbrokinase treatment group (n = 23). The control group was given atorvastatin calcium 10mg every night; on top of this, the treatment group had Lumbrokinase 600,000U tid. Results were compared after eight weeks of medication. RESULT: Lumbrokinase was effective in improving hemorheology and blood lipids in patients with hyperlipidemia.

KEY WORDS: lumbrokinase, blood lipids, hemorheology

1. DATA AND METHOD

1.1   Subjects
46 patients (inpatients and outpatients) were selected from Luzhou Medical College Affiliated Chinese Medicine Hospital between March 2006 and January 2007. All met the primary hyperlipidemia criteria within the "Prevention and Treatment of Abnormal Blood Lipid Guidelines" set by the 1997 Chinese Journal of Cardiology editorial committee. Twenty-three were randomly assigned into the experimental group, including 11 males and 12 females between 35-72 years of age, and an average age of 59±10 years. The 23 subjects in the control group include 12 males and 11 females between 36-71 years of age, and an average age of 58±11 years.

1.2   Experimental Method
Control group and experimental group were given atorvastatin calcium 10mg daily before bedtime. In addition, experimental group were given lumbrokinase 600,000U tid for eight weeks. Blood lipids and hemorheology were examined at the end of study.

2. RESULT
See table 1 and table 2.

3. DISCUSSION
Lumbrokinase is a protein preparation extracted from special earthworms and has fibrinolytic activities. It has urokinase-like plasminogen activator and plasmin-like activities. Lumbrokinase not only can dissolve thrombi, but it also has an anticoagulant activity. Fibrinogen is an important factor contributing to blood viscosity, and it facilitates thrombus formation. In the treatment group, the fibrinogen level declined dramatically after treatment.

Lumbrokinase's functions include: ① having a selective affinity for fibrinogen. It can hydrolyze fibrinogen into soluble fibrinogen degradation products and decrease fibrinogen level. ② enhancing intrinsic fibrinolytic system by activating plasminogen to plasmin. ③ reducing platelet aggregation and improving hemorheology. Lumbrokinase significantly improved hemorheology in patients with hyperlipidemia.

The study showed that lumbrokinase and atorvastatin calcium combination had statistically better improvement in lipids and rheological parameters than the atorvastatin calcium alone. This indicates that lumbrokinase has an effect in the treatment of primary hyperlipidemia; however, its mechanism still needs to be elucidated.

TABLES:

Table 1 Post-Treatment Blood Lipids ($\bar{x}\pm s$)

Group	n	TG (mmol/l)	TC (mmol/l)	LDL-C (mmol/l)
Control	23	1.74±1.19	4.71±1.10	3.20±0.49
Experimental	23	1.10±0.78**	4.03±1.12**	2.57±0.45*

Note: * compared with control group, *P<0.01*; ** compared with control group, *P<0.05*

Table 2 Post-Treatment Hemorheology ($\bar{x}\pm s$)

Group	n	High-shear blood viscosity	Low-shear blood viscosity	Plasma viscosity	hematocrit value	Fibrinogen
Control	23	5.98±0.64	8.93±1.20	1.79±0.31	43.76±3.4	4.10±0.21
Experimental	23	5.56±0.68**	8.23±1.10**	1.52±0.29*	41.09±2.9*	3.62±0.20*

Note: * compared with control group, *P<0.01*; ** compared with control group, *P<0.05*