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Salvia Miltiorrhiza Bge.f.alba Ameliorates the Progression of Monocrotaline-Induced Pulmonary Hypertension by Protecting Endothelial Injury in Rats

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Abstract

Pulmonary hypertension (PH) is a life-threatening disease that is characterized by elevated pulmonary blood pressure, abnormally thickened pulmonary arteries, and right ventricular hypertrophy. Monocrotaline (MCT) has been used to generate an experimental model of PH in rats, with PH initiated from injuries of lung vascular endothelium. Salvia Miltiorrhiza Bge.f.alba is a widely used traditional herb in China, known to exert protective effects on vascular endothelial cell injury in animal experiments. However, the role of Salvia Miltiorrhiza Bge.f.alba in PH remains unclear. Thus, we investigated the effects of the aqueous extract of Salvia Miltiorrhiza Bge.f.alba (AESM) on MCT-induced PH and explored the pertinent mechanism. PH was induced in rats by a single subcutaneous injection of MCT (60 mg/kg body weight). Low or high dose (4.6 g/kg or 14 g/kg body weight) of AESM was then administered orally for 21 days to PH rats. Hemodynamic study showed that AESM reduced mean pulmonary artery pressure and improved right ventricle function. Lung pathological analysis revealed that AESM reduced wall thickness and lumen stenosis of pulmonary vessels. Also AESM ameliorated right ventricular hypertrophy. Measurement of biochemical parameters indicated that AESM decreased endothelin-1 and thromboxane A2 in plasma and increased nitrogen monoxide and prostacyclin in the plasma and reduced the increase of transforming growth factor β 1 in lung tissue. Our results suggest that AESM may ameliorate the progression of MCT-induced PH in rats, at least in part by its protective effect on endothelial injury. Therefore, Salvia Miltiorrhiza Bge.f.alba could be useful in the treatment of PH.

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