

# Preparation of betaine injection and its therapeutic effect on pulmonary arterial hypertension

Tian Xia<sup>1</sup>, Hui Liu<sup>1</sup>, Cong Li<sup>1</sup>, Siyun Liu<sup>1</sup>, Ping Ma<sup>1</sup>, Qingbin Xu<sup>1</sup>, and Ru Zhou<sup>1</sup>

<sup>1</sup>Affiliation not available

March 27, 2023

## Abstract

Pulmonary arterial hypertension (PAH) is a life-threatening disease characterized by elevated pulmonary pressure, right ventricular failure (RVF) and ultimately death. Aggressive treatment of RVF is considered the most important therapeutic strategy. In this study, betaine injection was prepared and characterized by various techniques. The therapeutic efficacy of gavage (I.G.), nebulized inhalation (Inh.) and intravenous (I.V.) injections was evaluated comprehensively in terms of pharmacokinetics, tissue distribution and pharmacodynamics using three different methods of administration. The results of pharmacokinetic demonstrated that Inh. betaine injection significantly prolonged the half-life of the drug, increased its internal circulation time and increased Inh. administration significantly improved the pharmacokinetics of betaine compared to I.G. and I.V. administration. Combined with biodistribution experiments verified that betaine formulation could accumulate in lung tissue via Inh. The results of pharmacodynamic further confirmed that right ventricular systolic pressure (RVSP), mean pulmonary artery pressure (mPAP) and right ventricular hypertrophy index (RVHI) were increased in the model group and that betaine prepared by Inh. was able to suppress this increase to levels similar to those observed in the control group. Consequently, Inh. administration would be a promising strategy for the treatment of PAH-induced RVF.

## Hosted file

Manuscript.doc available at <https://authorea.com/users/600277/articles/631939-preparation-of-betaine-injection-and-its-therapeutic-effect-on-pulmonary-arterial-hypertension>







