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中文摘要:考察丹参注射液中主要水溶性成分丹参素(DSS), 原儿茶醛(Pal), 丹酚酸A (SalA) 和丹酚酸B(SalB)含量变化对大鼠血浆中高半胱氨酸(Hcy)代谢的影响。大鼠随机分为急性心肌梗死模型组、丹参注射液组和4个成分外加组,后者在丹参注射液基础上依次外加DSS、Pal、SalA和SalB至原有含量的3倍、2倍、10倍和10倍。通过结扎大鼠冠状动脉造成急性心肌梗死模型后给予生理盐水或相应药物,48 h内测定血浆中Hcy和谷胱甘肽(GSH)含量。建立神经网络模型,采用Garson算法评价4种成分对Hcy和GSH影响的贡献率,同时考察贡献率随时间的动力学变化。结果表明,急性心肌梗死使得GSH含量显著降低,Hcy水平长期处于升高状态,给予丹参注射液后使GSH更快地恢复至基线水平,降低Hcy水平。与丹参注射液组相比,成分外加对GSH和Hcy含量均有促进作用,尤以给药后1 h内更为显著,其中外加SalA或Pal表现最明显。计算结果显示,各主要活性成分对Hcy和GSH的贡献率从大到小排序依次为:SalA、Pal=SalB、DSS,其中SalA对Hcy和GSH的贡献率显著高于其他组份,丹参注射液中丹酚酸类物质含量变化对高半胱氨酸转甲基代谢及转硫途径有显著影响,这提示该类物质可能通过上述途径发挥其心血管保护作用。

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Effects of content variation of water-soluble components in *Danshen* injection on homocysteine metabolism in rats

Abstract:This study was to investigate the effects of content variation of major water-soluble components in *Danshen* injection on homocysteine (Hcy) metabolism in rats. Acute myocardial infarction (AMI) rats were induced by coronary artery ligation, and then randomly divided into model control, *Danshen* injection group, and *Danshen* injection with the addition of danshensu (DSS), protocatechuic aldehyde (Pal), salvianolic A (SalA) or salvianolic B (SalB), respectively. Based on plasma concentrations of Hcy and glutathione (GSH), a neural network model was developed to characterize the profiles of Hcy and GSH. Garson algorithm was applied to evaluate the contributions of water-soluble components in *Danshen* injection on the Hcy and GSH levels. It was shown that the plasma concentration of GSH declined significantly, while the Hcy level increased in AMI rats. After treatment with *Danshen* injection, the two indices restored to baseline levels. Compared with those of *Danshen* injection group, the plasma level of GSH and Hcy were elevated after treatment with *Danshen* injection added water-soluble components, among which SalA and Pal had the most significant effect, especially within 1 h drug administration. The calculated values by neural network model indicated that the effects of water-soluble components in *Danshen* injection on the Hcy and GSH were: SalA>Pal=SalB>DSS, in which the contribution of SalA to the Hcy concentration was most significant. In conclusion, content variation of salvianolic acids in *Danshen* injection has a distinct effect on the Hcy remethylation and trans-sulphuration pathways, while the underlying mechanisms need to be clarified further.

keywords: [Danshen injection](#) [pharmacodynamic interaction](#) [homocysteine](#) [reduced glutathione](#) [contribution](#) [acute myocardial infarction](#)

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