

bility of 0.999, it can be argued that the average value for a larger sample will not exceed the range found.

2) The mean value of the content of lipid hydroperoxides of blood plasma was 32.78 nmol / ml, the median was 31.8 nmol / ml, the standard deviation was 3.2 nmol / ml. Confidence interval: (28.33; 37.24) nmol / ml. With a probability of 0.999, it can be argued that the average value for a larger sample will not exceed the range found.

3) The mean value of the content of diene conjugates of blood plasma was 39.38 nmol / ml, the median was 39 nmol / ml, the standard deviation was 2.5 nmol / ml. Confidence interval: (35.83; 42.94) nsol / ml. With a probability of 0.999, it can be argued that the average value for a larger sample will not exceed the range found.

Conclusion

Taking into account that the normal LPO indices are equal to: malondialdehyde - less than 2.5-6.0 nmol / ml, lipid hydroperoxides - 24.17-26.3 mol / l, diene conjugates - 38.45-73.4 nmol / ml, it can be concluded that:

1. the average Malonialdehyde content does not go beyond the standard values.
2. the average index of the content of lipid hydroperoxides exceeds the upper limit of standard values;
3. the average content of diene conjugates does not go beyond the standard values.

It is also necessary to note the finding of confidence intervals for the values of malonic dialdehyde and diene conjugates contained in the blood plasma, within the standard values, therefore, for large samples, the average values of these indicators will also remain within the norm. But taking into account the excess of the norm of the average content of lipid hydroperoxides, we can not give a definitive answer about the effectiveness or ineffectiveness of AOS work. To fully display the ratio of LPO-AOS, it is necessary to analyze the plasma content of ceruloplasmin, vitamin E and conduct an integral assessment of oxidative stress.

Email: kcynichka_95@mail.ru

STUDIES ON THE METABOLISM OF THE MAIN ACTIVE COMPONENTS OF HUAQIZEREN IN RAT URINE AND FECES

Pengyang Yu¹, Qijing Huang¹, Pengling Ge¹, *

¹Department of Pharmacology, School of Basic Medical Sciences, Heilongjiang University of Chinese Medicine, Harbin 150040, China *Corresponding authors: Pengling Ge, Department of Pharmacology, School of Basic Medical Sciences, Heilongjiang University of Chinese Medicine, 24 Heping Road, Harbin 150040, China; E-mail: penglingge@126.com

Objectives: The contents of three main active ingredients (ginsenoside Rb1, alismate A-24-acetate and 9-HODE) in the urine and fecal samples of Huaqizeren standard mixed rats were determined by HPLC-MS/MS. The metabolic pathways were identified, and the biotransformation of Huaqizeren in vivo was explored.

Materials and methods: Rats were fed with urine and fecal samples after administration of the three standard ingredients (ginsenoside Rb1 0.16%, Alisma alcohol A-24-acetate 0.0045% and 9-HODE 0.013%). Before and after administration for 12 h. The search and confirmation of metabolites were analyzed by UPLC-Q-TOF / MS.

Results: ① The average concentration of ginsenoside Rb1 in urine and feces was 213.1±85.32 ng/ml, 2.578±1.117 mg/g, after administration of 0~12h. The average concentration of A-24-acetate in urine and feces was 12.54±4.428 ng/ml, 0.1263±0.03409 mg/g. The average concentration of 9-HODE in urine and feces was 40.14±12.23 ng/ml, 0.2260±0.04811 mg/g. ② In the urine ginsenoside Rb1 mainly to the prototype drug-based, in addition to ginsenoside Rb1 related metabolites 13 species, the structure identified as Ginsenoside Rd, Ginsenoside Rg3, Ginsenoside Rh2, Ginsenoside F2, Ginsenoside Cpd K, Gypenoside XVII, Gypenoside LXXV, Ginsenoside Ppd, Monooxygenated Rb1, Di-oxygenated Rb1, Dehydrogenated Rb1, Combined Rb1 (1), Combined Rb1 (2). Alcohol A-24-Acetate Metabolites Alisol A, 9-HODE Metabolites 9-oxoODE. In the feces, four kinds of ginsenoside Rb1 related metabolites were found, identified as Ginsenoside Rd, Ginsenoside F2, Ginsenoside Cpd K, Ginsenoside Ppd. Alcohol A-24-acetate metabolite Alisol A, no 9-HODE metabolite.

Conclusion: This study established a sensitive and reliable HPLC-MS/MS method to determine the concentration of ginsenoside Rb1, Alisma A-24-acetate and 9-HODE in rat urine and feces. In the urine, feces found in the three active ingredients related metabolites, suggesting that urine, feces may be the three active ingredients of Citrus grandis important metabolic pathway, in order to determine the basis of Huaqizeren drug substance and improve the pharmacokinetic study. Lay the foundation.

Key words: Huaqizeren; ginsenoside Rb1; Alisma alcohol A-24-acetate; 9-HODE; HPLC-MS/MS

References:

- [1] Li Yikui, Wu Jianyu. Xiaoqinglong Decoction serum on the peritoneal hypertrophy of rats induced by degranulation and histamine release [J]. Chinese Journal of Integrated Traditional and Western Medicine, 2000, 20: 40-3.
- [2] Luo Fen, Chi Yumei, Wu Hao. Overview of metabolic kinetics of traditional Chinese medicine [J]. Chinese Journal of Experimental Prescription, 2011, 17 (14): 284-288.
- [3] Wang Yao, Ji Yubin, Chen Mingcang. Study on the interaction between traditional Chinese medicine and intestinal flora [J]. Chinese Medical Journal, 2012, 9 (2): 12-14.

- [4] Zhang Chen, Zhao Gang. Advances in pharmacological effects of ginsenoside Rd [J]. Chinese Journal of New Drugs 2011,20 (11): 953-958.
- [5] Zhou Chaoqun. Biosynthesis of ginsenoside Rd and its biological activity [D]. Shanghai: Fudan University, 2011.
- [6] Li Wei. Ginsenoside Compound K on hypoglycemic effect of type 2 diabetes and hepatic gluconeogenesis signal transduction pathway regulation [J]. Jilin: Jilin University, 2012.
- [7] Zhou Wei. Preparation and activity of rare ginsenoside compound K [D]. Shanghai: Fudan University, 2008.
- [8] Li Wei. Ginsenoside Compound K on hypoglycemic effect of type 2 diabetes and hepatic gluconeogenesis signal transduction pathway regulation[J]. Jilin: Jilin University, 2012.
- [9] Mao Jingjing, Zhang Tong, Wang Bing, Tao Jiansheng. 20 (S) - protopanaxadiol pharmacological effects of research progress [J]. Chinese experimental prescription Journal of Academic Research. 2011,17 (24): 274-277.
- [10] Wu Qinan, Wang Lixin, Zhang Qiao. Preliminary study on the pharmacokinetics of 24-ethylphthalide allyl alcohol A, 23-ethylphthalocyanine diol B [J]. Journal of Medical University, 2007. 8 (27): p. 308-310.

PROGRESS ON THE PHARMACOLOGICAL ACTIONS OF DANSHENSU

QIAN Si-yuan, ZHANG Bo, LI Wei, XU Yang, HUANG Shu-ming*

(Institute of Chinese Medicine, Heilongjiang University of Chinese Medicine, Haerbin 150040, China)

Abstract Salvia miltiorrhiza is a traditional Chinese medicine, which is extensively used in treatment of cardiovascular treatment. The water-extractable component of the medicinal herb Danshen (Salvia miltiorrhiza) is Danshensu, which had become one of the research central point. This study summarizes its pharmacological research of danshensu focused on the characteristics of the activity.

Keyword: Salvia miltiorrhiza; Danshensu; pharmacological actions

Introduction The family of Labiatae includes Salvia miltiorrhiza, which the dried roots were called danshen. Traditional Chinese medicine of danshen was often used for treatment of cardiovascular diseases, such as effective for promoting blood circulation, relieving blood stasis, angina pectoris, myocardial infarction and stroke. Mechanism may involve that Danshen has ability to enhance of antioxidant defenses activities and reduce or eliminate the free radicals. Meanwhile, Danshen has also been proved to attenuate the increased calcium in cells caused by anoxia-reoxygenation in the isolated ventricular muscle cells. It decreases transformation of xanthine oxidase from xanthine dehydrogenase and reducing the production of oxygen free radicals[1].

The components of Danshen can be divided into lipid-soluble and water-soluble. The lipid-soluble fraction contains that more than 30 diterpenoid tanshinones. On the other hand ,the water-soluble fraction includes that salvianolic acid B lithospermic acids, protocathechuic acid. rosemarinic acid. Water decoction is the most commonly used method of preparing Chinese folk medicine for human consumption. So, the putative active components of its aqueous extract are Danshensu. We hope more viewers will appreciate the approach of traditional Chinese medicine[2].

Pharmacological actions of Danshensu Danshensu improves of cardiovascular dysfunction

Myocardial hypertrophy caused by adaptive response of the heart muscle for overload of blood. The compensatory drawbacks, mainly because of myocardial hypertrophy increased aerobic, and coronary blood flow, often can't meet their needs, so the hypertrophy myocardial function if cannot maintain normal for a long time, finally induce to cardiac failure. Tang[3] and others evaluated the protective effect of the myocardial hypertrophic rats induced by Danshensu, and the first reported that Danshensu can reverse the middle crevice of the mind.

Prevention and treatment of atherosclerosis Endothelial injury is recognized as the initiating factor of atherosclerosis. Low density lipoprotein, which induces the proliferation of smooth muscle cells that an important factor of atherosclerosis. Zheng[4] discovered that Danshensu can significantly reduce expression of PDGF-BB but suppress low density lipoprotein. The results showed that the anti-oxidant low density lipoprotein can reduce the proliferation of the smooth muscle cells, which may be responsible for lowering the expression level of PDGF-BB.

Danshensu has effect of anti-cancer Zhang[5] evaluated with antitumor activity of B16F10 melanoma cells and HUVEC proliferation, but decline the expression of MMP-2,9 and VEGF in the cells. In animal experiments, Danshensu significantly inhibits spontaneous and experimental B16F10 melanoma cells models of transfer. So these results suggest that Danshensu can be an anti-tumor effect by inhibiting tumor angiogenesis and tumor invasion[6].

Conclusions To sum up, with deepening the research, which is increasingly clear. Pharmacological activities and mechanisms of continuously new pharmacological effects were found, and hope that with the early in disease prevention and control can be made full use of propotion the development of traditional Chinese medicine modernization

References

- [1] Chan K, Chui S H, Wong D Y L, et al. Protective effects of Danshensu from the aqueous extract of Salvia miltiorrhiza (Danshen) against homocysteine-induced endothelial dysfunction[J]. Life Sciences,2004,75(26):3157-3171.
- [2] Lam F F Y, Yeung J H K, Chan K M, et al. Relaxant effects of danshen aqueous extract and its constituent danshensu on rat coronary artery are mediated by inhibition of calcium channels[J]. Vascular Pharmacology,2007,46(4):271-277.