ESTABLISHMENT OF TRADITIONAL CHINESE MEDICINE MODEL OF PHLEGM AND BLOOD STASIS OF CORONARY HEART DISEASE

Yuhang Pang Xiaoyang Hu Wei Guan Qiang Fu Ji Li※

Heilongjiang University of Chinese Medicine, Harbin 150036, China

Abstract Coronary heart disease(CHD) with high incidence has become an important part of disease in TCM. The establishment of animal model in accordance with TCM syndrome is the core of traditional Chinese medicine research. Nowadays, some methods have been confirmed to establish the animal model which fits for the TCM sydrome. This article aimed to review the progress of phlegm stagnation and blood stasis model and provide some theroy basis for further study on CHD.

Key words : animal model; coronary heart disease; phlegm stagnation and blood stasis

CHD belongs to the category of " chest pain " and " True heartache " in Chinese medicine. Improper or excessive greasy food intake can result in phlegm stagnation and blood stasis in TCM which will lead to CHD as well. There are some other syndromes such as qi deficiency, blood stasis, heart yang deficincy, blood stasis due to cold accumulation and so on. Syndrome differentiation based treatment is the characteristic of traditional Chinese medicine. The animal model for TCM syndrome is duplicated under the viewpoint of concept of wholism and syndrome differentiation of Traditional Chinese Medicine. Some model duplication methods about CHD were summarized in this literature.

Up to now, three kinds of animals have been confirmed always to be used in the establishment of the phlegm and blood stasis syndrome of coronary heart disease animal model.

ApoE gene knockout mice were fed with high fat diet for 6 weeks, and the mice were injected subcutaneously isoprenaline (0.02 mL/g) for the first 7 days before sacrifice. At zeroth week, the body weight of mice was observed at the end of the sixth week, and the activity of the mice, the incidence of anorexia and the edema of the lower limbs, and the condition of defecation was observed at the end of the sixth week. The establishment of the animal model was evaluated by the changes of the left ventricular function by ultrasonsgraphy and blood levels of lipid[1].

Rats are used to duplicate the model as well. They were fed with common forage and high fat forage respectively for 10 weeks and the coronary left anterior descending branches were injured by ballon intervention technique after 2 weeks. The model establishment and its physiopathological indices were evaluated by examination on body mass model (BMI), blood levels of lipid, high-sensitivity C-reactive protein(hs-CRP)[2].

The rats were fed with high fat diet for 7 weeks, and the coronary artery ligation was performed on the thirty-fifth weeks in order to block the blood and increase the degree of blood stasis. The established model was evaluated by ECG, blood levels of lipid, myocardial enzyme and hemorheology. The researchers believed that the animal model with high fat diet and coronary artery ligation is similar to the characteristics of coronary heart disease with syndrome of phlegm and blood stasis[3].

The rat or mice model has a lot of advantages including low cost, strong survival ability, low death rate and wide application range however the drawbacks of the model are the long experimental period, unstable lesions, and individual variation. Coronary angioplasty which involves open-heart surgery increases the difficulty of model duplication and the mortality of laboratory animals.

Nowadays more and more researchers duplicate the CHD model with pigs, which are similar with humans in anatomy, physiology, nutrition, especially the cardiovascular system. Micro-invasive modeling method its can avoid thoracotomy on animal damage in the thorax and the destruction of the environment. The stability and repeatability of the model are guaranteed by controlling the balloon size, length, number of expansion, expansion pressure, expansion duration and high fat feeding time and other factors. The method can impove the level of BMI and blood lipid, increase the release of inflammatory mediators, and finally lead to the obvious changes of myocardial ischemia. But the price is expensive and the balloon injury method may cause serious internal elastic plate and membrane damage, so we should pay close attention to the balloon and vessel diameter ratio in the modeling process for avoiding excessive damage to the blood vessels. Transgenic mice possess the advantages of less individual differences between the experimental animals, the stability of the model, and less modeling period.

References:

[1] GAO Shan,YIN Jia,SONG Yan-qi,et al.Preliminary experimental study on the establishment and evaluation of mice model about coronary heart disease with phlegm and blood stasis syndrome[J].Tianjin Journal of Traditional Chinese Medicine. 2017,34(2):117-119

[2] Li Xin-zhi,Liu Jian-xun,Ren Jian-xun,et al.Establishment of coronary heart disease model of phlegm-stasis cementation syndrome type in mini-swines[J].Chinese Journal of Integrated Traditional and Western Medicine, 2009,29(3):228-232

[3] Zhu Li-hong, Wang Ke-ming, et al. Study on replication of animal model of phlegm and blood stasis syndrome of coronary heart disease[J]. Journal of Guangzhou University of Chinese Medicine, 2006,23 (4): 346-349