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The Present Situation and Thinking of the Animal Model of "Yin Deficiency"

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***Abstract*-Objective: To investigate the existing deficiency model modeling methods, model features, mechanisms and existing problems, propose new ideas deficiency model. Methods: Analysis of literature and practice researchers combined the existing deficiency model characteristics summarized. Results: The existing deficiency model have their own characteristics, deficiency model has further improved as necessary. Conclusion: The proposed establishment of a new joint animal models and clinical thinking Yin closer, simulation cause model.**

Keywords-"Yin Deficiency"; modeling method; model characteristics

"Yin deficiency" is the noun of traditional Chinese medicine. It is relative to "Yang Deficiency". It is a pathological phenomenon of blood or body fluid loss. The blood and body fluid in Chinese medicine are belong to "Yin", so it is called "Yin deficiency", in the strain of illness or fever due to Yin fluid friction in patients after. The main symptoms of Yin deficiency are the hot tide in the afternoon, the sweating, the malar red, the emaciation, the tongue red and the little moss, etc. But the pathogenesis of "Yin deficiency" needs to be further explored. It is necessary to establish an ideal model of "Yin deficiency". The ideal model of "Yin deficiency" can screen more drugs and is more beneficial to the treatment of yin deficiency. In recent years, the research of yin deficiency has become an important topic in medical science, has successfully established a variety of yin deficiency syndrome model. This paper analyzes the clinical manifestation and advantages and disadvantages of common modeling methods, modeling method under the guidance of traditional Chinese medicine theory and Modern medical theory and so on. It aims to improve the related model of yin deficiency syndrome and establish a new model. So the researchers choose a more suitable animal model based on their research purposes. The current status of the research is summarized as follows:

I. MODEL METHOD UNDER THE GUIDANCE OF THE THEORY OF TRADITIONAL CHINESE MEDICINE

TABLE 1 MODEL METHOD UNDER THE GUIDANCE OF THE THEORY OF TRADITIONAL CHINESE MEDICINE

Model Method	Disease Phenotype	Characteristic
Each half of the male and female, KM, mice, ig (Aconite: dried ginger: cinnamon=1:1:1).	In plasma, cAMP and cAMP/cGMP rise, SOD; In the liver homogenate, MDA content increase, GSH-PX activity reduct.	It is conform to the clinical characteristics of the Yin Syndrome, but it is difficult to define the asthenic fever and sthenopyra.
rats, 6 weeks of swimming,5 days a week, Daily swimming time increases from 10 minutes to the fifth weekend and 120 minutes, last for a week.	A significant decline in weight, the increasing trend of Anal temperature, slim and small, the fur is dry, after the day of swimming training, disturb with fear, Jumping around in the cage, a high horror of excitement. plasma, corticosterone increase, In serum, SOD significant reduction.	It is helpful to study the pathophysiology of the syndrome of yin deficiency and internal heat.
Male, SD, rat, bondage of the hind limbs of rats, hang on the cage, infuriated 20min for the first time, every 1d, increase 10min, last 20d.	obvious emaciation, activity decrease, hunchbacked, less diet, In plasma, cAMP reduction, E2/T rise.	It is the pathogenicity of emotional disorder, in accordance with Chinese medicine seven pathogenic characteristics
rat, in sychometric room(dry bulb 4^0C and wet bulb 32^0C), heat stress 3h, measure anus temperature.	Ecphysesis, in a state of lethargy, stretched, the flush of the exposed parts of the ear, paw, tail, etc. salivate, anal temperature rise	it is difficult to define the asthenic fever and sthenopyra.
Each half of the male and female, SD, rat, the senna is the cause of diarrhea, accompany swimming, last 1 month.	weight loss, irritability, bites, anus temperature rise, dry stool, Back hair and withered, unequal intake of food, more drinking water	Complex method, it can lead to the dysfunction of the organ in rats, this will affect the results of clinical drug application
Each half of the male and female, Wistar, rat, high salt feed(salt 9%),after 30d, the tap water turn into brine, last 150d.	blood pressure rise, in urine VMA and 17-OH content increase.	It takes a long time, It is not easy to judge whether the model is successful or not.

The above is the common method of the model of "Yin deficiency" of mice and rats under the guidance of the theory of traditional Chinese medicine. Rabbit model of "Yin deficiency" commonly use Li Shui to hurt the Yin. The method of dehydration mainly by water prohibition, jejunitas and diuresis. The specific modeling method is as follows: Healthy rabbit, water prohibition and jejunitas 18h before the experiment, and then in the state of natural

sobriety, furosemide injection by ear vein injection, the dose is 2.5ml/kg, the same operation after 1h, and after 1h, 300 EU/kg of Bacillus coli was injected by ear vein injection.

Yin deficiency belongs to the category of traditional Chinese Medicine, the modeling method under the guidance of the theory of traditional Chinese medicine is more close to clinical, "Yin deficiency" by fever after injury or diseases Long Yin fluid, or because five excessive emotional activities and excessive use of warm dryness goods and so on, so that body fluid consumption. At the same time, due to the imbalance of yin and Yang in the body, Yang Qi is exuberant and hot. Replicating animal models is essentially to screen out drugs that are effective in treating the disease. Therefore, the drugs selected by these models are more clinically symptomatic. But the time required by the theory of traditional Chinese medicine is often longer. In addition, there are some shortcomings. For example, the modeling method is more complex. It can lead to the dysfunction of the organ in rats. This will affect the results of clinical drug application. The temperature rise is not obvious. The model is not very stable, and it is difficult to define the asthenic fever and sthenopyra.

II. MODEL METHOD UNDER THE GUIDANCE OF THE THEORY OF MODERN MEDICINE

A. Adrenal Hormone Induced Yin Deficiency Model

This method of modeling mainly uses glucocorticoid, the main use of the short effect class (hydrocortisone), the middle effect class (strong pine dragon) and so on.

TABLE 2 ADRENAL HORMONE INDUCED YIN DEFICIENCY MODEL

Model Method	Disease Phenotype	Characteristic
Male, SD, rat, ig cortisol 4d, 5mg/100g,at 17:00.	Irascibility, restlessness, hair color is not light, liver in tissue homogenate, decrease of CORT content	Short molding time
NIH, mice, each half of the male and female, ig thyrine 3mg and reserpine 0.02mg.once a day, last 7 days.	Slow action, weight loss, lowering blood sugar level, weight, spleen coefficient and thymus coefficient decreased obviously.	A variety of characteristics that conforms to the cause of disease.
each half of the male and female, cavies, im, prednisone acetate, 50mg/kg/d, last 10d.	Agitation, easy shock, there is a decrease in food and a slow increase in weight, dry stool, the activity decreased significantly	Injections are more likely to take effect

B. Thyroxine Induced Yin Deficiency Model

TABLE 3 THYROXINE INDUCED YIN DEFICIENCY MODEL

Model Method	Disease Phenotype	Characteristic
each half of the male and female, SD, rats, ig, thyroxine, 2.5mg/kg, last 21d.	accelerated heart rate, increase in drinking water, urine volume and weight loss, blood sugar, pain threshold, thyroid index, serum IgG content decreased, increase in serum T3, T4, Cu, Zn and Cu/Zn	Hyperthyreosis, hyperactivity of fire
Male, KM, mice, ig, thyrine 150mg/kg and reserpine 1mg/kg. once a day, last 6d.	Weight loss, thin body, restless, Some are absent, slow in action, and some death.	method goes easily simply
Male, Wistar, rats, ih, thyrine, 0.85 mg/kg/d, last 30d. Thirty-first days, ih, thyrine, 1.7 mg/kg/d, last 30d,at the same time, ig dexamethasone 320 mg/kg, q.o.d, A total of 15 times	Cardiac coefficient increased and myocardial cells were necrotic, the nucleus dissolves, it can be seen that the myocardium is fatty infiltration, and the fibrous tissue is proliferating.	the models of heart failure

The modeling method under the guidance of the theory of Western medicine is convenient to implement, and the model cycle is shorter, it can simulate the symptoms of yin deficiency caused by excessive hormone overdose and targeted, the therapeutic effects of the selected drugs on these Yin deficiency syndrome are better. But the model made by this kind of method is relatively simple, the clinical causes are often complicated, there are individual differences between animals. Therefore, the dosage of the model drug is not easy to grasp, some hormones are also different at different times in the body. The appropriate animals should be selected and the dosage should be strictly controlled.

III. OTHER MODELING METHODS

In addition to some traditional model building methods of the model of yin deficiency, there are some other methods that can also cause the model of yin deficiency, as follows:

A. Operation Model

Wistar rats, 150~200g,intraperitoneal injection of pentobarbital sodium(40 mg/kg) anesthesia, surgical separation of left renal artery, narrowing the left renal artery with 0.2 mm silver clips, do not touch the right back, intraperitoneal suture and injection of penicillin(10IU) after operation, routine rearing, model success for a week.

B. Ovariectomized Model

3% chloral hydrate ip anesthetized rats, abdominal fixation, in the end of the rib on the spine from the midaxillary line about 2 cm shearing, Open skin and muscle of the back, to pinch out the ovaries and separate the fatty groups, removal of bilateral ovaries after ligation of the oviduct in the ovary, After surgery 4, 5, 6, 7 days, only vaginal smear to determine the total ovarian extirpation, seventh days after operation, ig thermal traditional Chinese Medicine(Aconite: dried ginger=1:1, frying 50% Decoctions), 20 mL/kg, once a day, last 14d. the success of modeling.

C. Carbon Tetrachloride (CCl4) Induced Liver Cirrhosis Yin Deficiency Model in Rats

Hypodermic injection CCl4 3mL/kg, and then use 50% CCl_4 olive oil solution, 2 ml/kg doses were injected subcutaneously, 2 times a week for 12 weeks, It is considered to be successful in modeling.

These models reflect the progress of modeling technology, they have especial, it can be directed against some specific causes of yin deficiency, taking into account the diversity of the cause, screening drugs make the drug more comprehensive in the treatment of yin deficiency. However, this kind of modeling method is very difficult, and the technical requirement of the experimenter is higher.

Summary literature we can discovery, The main symptoms of the yin deficiency model are anal temperature rise, weight loss, the stool is formed but it has more water; The increase of plasma cAMP content and cAMP / cGMP value, the activity of superoxide dismutase (SOD) in the plasma of mice was reduced and the content of malondialdehyde (MDA) in the liver homogenate was increased.

IV. THINKING

All kinds of models inevitably have advantages and disadvantages. We also need to continue to improve these models. The method of making model under the theory of traditional Chinese medicine is longer and more complicated. It is easy to affect the function of the viscera of animals, thus affecting the curative effect of the drug. Modern medical modeling methods are also inadequate. The modeling methods such as adrenaline and thyroxine differ in model dose and model time. According to the existing modeling method, we can use the combination of Chinese and western theory model method, in the model under the guidance of the theory of traditional Chinese medicine, some appropriate doses of hormones can be administered or injected. This can shorten the molding time. It can also be closer to the clinical cause, thus it is more in line with the clinical pathogenicity. The existing model of the yin deficiency has its own characteristics, contributing to the research of the disease. The modeling method under the guidance of the theory of traditional Chinese medicine is closer to the clinic. Conforming to the pathogenic characteristics of traditional Chinese Medicine, it takes the environment, climate, and emotions into consideration. The modeling method under the guidance of modern medicine has the advantages of short time and easy to master.

The establishment of a suitable animal model of yin deficiency is of great significance in the study of yin deficiency and its complications, it is the basis for the study of its pathogenesis, diagnostic criteria and treatment schemes. a new model of mould making should be opened up to study the study of yin deficiency, putting forward the concept of a joint animal model, a disease cannot be fully simulated by a model, considering that two or more models are reproduced on the same animal; A combination model of modern medical Yin deficiency model plus syndrome model factors is established, at the same time, the Chinese and Western combination model of the factors of yin deficiency model of traditional Chinese medicine theory is established. the combination of the two types of models can integrate the characteristics of the two models to better reflect the clinic from different angles.

Replicating animal models is not the ultimate goal. Screening effective drugs is the most important. In the present society, the yin deficiency is not the "patent" of the old people, and the young people are also more and more empty. Nowadays, many young people in the society are living very fast. The pressure is several times higher than before. They spend much time on mental consumption, physical strength, especially energy overdrafts. They often stay up late and lack of sleep, eating spicy and spicy tastes on the diet. If you do not pay attention to the adjustment, it is easy to be "blue" in the yin deficiency. Therefore, the study of yin deficiency is more important.

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