

Research progress and prospect of acupoint catgut embedding therapy for nonalcoholic fatty liver disease

Shuhan Yang^{1,a,*}, Xiaoni Kou^{2,b}

¹*Shaanxi University of Traditional Chinese Medicine, Xianyang, Shaanxi, China*

²*Second Department of Hepatology, Affiliated Hospital of Shaanxi University of Traditional Chinese Medicine, Xianyang, Shaanxi, China*

^aY779097325@163.com, ^bkouxiaoni321@sina.com

**Corresponding author*

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Abstract: Non-alcoholic fatty liver lesion infection syndrome (NAFLD) is a kind of chronic stress factor liver parenchyma injury induced by lipid cell metabolism disorder, which is mainly related to anti-insulin cell resistance disorder (IR) syndrome and hereditary alcohol-induced tactile disease. Its histological pathological changes include simple liver steatosis, nonalcoholic fatty hepatitis and liver fibrosis emerging after metabolic improvement disorder Liver cirrhosis and liver cancer [1,2]. With the development of human society and culture, the incidence of NAFLD disease has increased significantly in the world. The incidence of NAFLD disease in ordinary adults is 6.3% to 45.0%, which is an important reason for the development of chronic liver disease in children. At present, NAFLD therapy is mainly symptomatic treatment to control lipid metabolism, alleviate cardiac inflammation and insulin resistance, and there is no specific drug [3]. According to the traditional syndrome differentiation of traditional Chinese medicine theory, according to the exact cause of liver disease and the clinical stage characteristics of various major diseases, the stage of liver disease can be simply classified into two categories: "turbid phlegm" or "blood stasis" and "accumulation", and according to the current standard, the State Administration of Traditional Chinese Medicine has for the first time defined the standard TCM classification of highly fatty liver disease as "liver addiction" to [4]. In recent years, scientific research has also shown that NAFLD, including acupuncture, moxibustion, massage and other traditional Chinese medicine external treatment methods, has quite unique advantages and good application and development prospects [5]. Among them, acupoint catgut embedding therapy has the advantages of strong stimulation, lasting effect, longer treatment interval compared with ordinary acupoint technology, and relatively safe without obvious side effects, which greatly improves the compliance of patients, especially for "migrant workers" who are difficult to survive at a fast pace in modern society, which is also a good choice, so it has been widely used in clinical practice. Therefore, this article reviews the clinical research and mechanism of acupoint catgut embedding therapy for NAFLD by combining the latest relevant literature at home and abroad.

1. The basic theory of traditional Chinese medicine in the treatment of NAFLD with catgut embedding at acupoints

The predecessor of the acupoint thread embedding method is actually the acupoint sewing needle method and the acupoint embedding needle method. "Lingshu Endless" says: "The evil spirit of the long sick goes deep, and the prick of the sick goes deep and stays long". Its theoretical basis is derived from this. Zhang Jingyue, a famous folk physician in the Ming Dynasty, once said that acupuncture and moxibustion "for a long time, its qi must be deep, if the needle is not deep, it will be concealed, the disease cannot be reached, and if it is not long, the evil of consolidation cannot be dispersed". From this, we can conclude that acupuncture and moxibustion acupoint catgut embedding method was primarily used to assist in the treatment of multiple chronic patients and multiple intractable pain diseases of those who have not cured for a long time. At present, it is found that acupoint catgut embedding can become a comprehensive medical method, covering the acupoint sealing effect, acupuncture and moxibustion effect, blood pricking effect, the effect after tissue destruction, needle retention and needle embedding effect, thus achieving the overall effect of adjusting internal organs, balancing yin and yang, dredging meridians, regulating qi and blood, reinforcing deficiency and reducing excess, and strengthening the right and removing evil. "Lingshu Official Needle" also said: "The prick enters the internal needle slightly and stays for a long time, so that its empty pulse is also qi." The key to the effect of acupuncture is to get qi, and the retention of the needle can play a role in promoting qi and qi. Another person in the "Suwen Lihe Zhen Xie Lun" said: "It is necessary to stay still for a long time, and no evil cloth can get Qi." The acupoint catgut embedding plays a continuous role in the process of slowly dissolving, liquefying, and absorbing the human body through catgut and thread material, thus triggering the local gas reaction of the acupoint type human skin, so as to achieve a good therapeutic effect. Chen Liguang et al. Buried needle is guided by the theory of "staying in peace for a long time" in "On the truth and evil of separation and separation", and its role has greatly improved the stimulation effect of needle retention. The acupoint catgut embedding method uses thread instead of needle, which has the effects of "retaining the needle to get qi" and "entering the body to cure stubborn diseases", prolongs the effective stimulation time of meridians and acupoints, and restores the balance of yin and yang to the body [7].

2. Clinical effect of catgut embedding at acupoints on NAFLD

Li Yongfeng and other experts carefully screened and analyzed these 100 NAFLD patients in [8] cases, and timely helped guide them to correct and develop some unhealthy diet, exercise and hobbies. By controlling the reasonable diet structure of the weight loss population and finding some appropriate exercise methods to implement fat and weight reduction, for example, taking some indoor aerobic exercise with moderate or higher intensity first, and then taking acupoints Ganshu, Pishu Zusanli, Zhongfu, and Taizhou Wanguo Songde Tianshu are the basic acupoints, and the key points of differentiation of symptoms and signs are the use of Zhangmen (liver depression and spleen deficiency), Fenglong (internal stop of dampness and turbidity), Geshu (combination of phlegm and blood stasis), and Yanglingquan (moisture accumulation) for basic acupoint catgut embedding. A total of 50 patients with NAFLD have been successfully cured. The control group swallows the drug before meals by taking the capsule of liganon and silymarin. The total course of treatment for the two groups is four weeks. After the treatment for four weeks, after reducing the level of alanine aminotransferase (ALT), aspartate aminotransferase (AST), total blood cholesterol index (TC), and lipoprotein triglyceride lipoprotein index (TG) in blood phenylalanine, the effect of alleviating hyperlipidemia was significantly higher than that of oral liganon (silymarin capsule) group. The forty-second case of nonalcoholic steatohepatitis operated on Baliao acupoint was treated by embedding thread under the acupoint of [9], combined with Quyu Qingre Huazhuo Decoction. The patients in the control group

could also take the treatment of polyenoic phosphatidylcholine capsule as appropriate. After the completion of three and a half courses of routine treatment, the liver function indicators were normal, high fat level, fresh blood and leptin were rechecked before and after the course of treatment Normal CT value of liver/pancreas and kidney and changes of serum insulin resistance index (HOMA-IR). During the course of treatment, the serum leptin level and insulin resistance index have been significantly improved. Research has proved that Baliao acupoint catgut embedding method combined with Quyu Huazhuo decoction has a good clinical effect in significantly reducing the serum leptin receptor content of patients with nonalcoholic steatohepatitis, improving insulin resistance, reducing blood lipid content, and improving liver function level. Liang Bingjun et al. and [10] et al. treated NAFLD at Zusanli, Yanglingquan, Zhongfu, Qihai, Fenglong, Ganfei Shumen and other acupoints with catgut embedding at the selected part of acupuncture respectively, about 10 days a week, and actively cooperated with other Chinese herbal medicine treatments such as soothing the liver, clearing the eyes, removing phlegm, opening the orifices and activating blood circulation (such as Poria cocos 20 g each, Chaihu, Astragalus, Alisma orientalis, Hawthorn, Atractylodes macrocephala, Salvia miltiorrhiza, etc. 15 g each, tangerine peel, cassia seed, white peony root, wood incense, and French Pinellia ternata 10 g each), After continuous medication for at least six months, the total effective rate was higher than that of the study group taking polyene phosphatidylcholine capsule ($P < 0.05$), and the TCM syndrome score, liver function and blood lipid index were significantly lower than those of the study group ($P < 0.05$). To sum up, the combined treatment of acupoint catgut embedding has a good clinical effect on NAFLD, which can alleviate the clinical discomfort of patients, significantly alleviate liver dysfunction and dyslipidemia, and effectively alleviate liver lipid accumulation.

3. Mechanism of acupoint catgut embedding in the treatment of NAFLD

3.1 Effect of acupoint catgut embedding on regulating lipid metabolism

Liver lipid metabolism disorder and lipid accumulation are also key factors of NAFLD, and play a major role in the pathogenesis of NAFLD. Yang Xiwen et al. used [11] research to verify the obvious negative effect of the site fat embedding method on the protein synthesis and metabolism process of rats with nonalcoholic fatty liver. The conclusion pointed out that the site fat embedding method has a relatively positive and significant regulatory effect on the high fat index level of rats with nonalcoholic fatty liver model, and can effectively reduce the liver glutamine transaminase The concentration of fat protein synthetase (FAS) is increased, which significantly regulates the biosynthesis of liver lipid enzymes, and its metabolic mechanism is probably directly related to its participation in the regulation of PPAR pathway. Zhou Xiaoling et al the degree of TG of liver cells in the Elisa Hill Campus of Tullac University in Australia and the Elisa Hill Campus of Tullac University in Australia decreased significantly. However, because the degree of liver steatosis and inflammatory necrosis decreased significantly, the SREBP of the site catgut embedding group decreased significantly compared with the model group. It indicates that the prevention and treatment effect of acupoint catgut embedding on NAFLD poisoning caused by high-fat food may be closely related to the regulation of lipid metabolism, the regulation of oxidation process, and the regulation of SREBP negative one. In addition, the study also showed that γ In order to regulate the key transcription level factors of lipid cell decomposition and inflammatory response, and participate in the regulation of fat formation, blank liposome uptake and the expression of lipid metabolism genes, have the function of anti-inflammatory and significantly regulate insulin resistance [13] Li Xiaodong et al. [14] studied the mechanism of NASH in the treatment of catgut embedding at the selected acupoints, and used the catgut embedding at the selected acupoints, Qihai, and the two-week Wanguoshongde Tianshu therapy for eight weeks, The results show that PPAR in liver of patients

who must be treated with catgut embedding at acupoints- γ And gene expression significantly increased, so the effective mechanism of this drug may be related to the increase of NASH rat liver γ Performance.

3.2 Regulation of leptin and adiponectin

Leptin receptor is another kind of neurohormone produced in the hypothalamus of animals. It has a special role in affecting the rate of human feeding activities and regulating the distribution of heat in the body. It can effectively control the continuous stability of body fat concentration by directly controlling human diet, promoting the ability of peripheral neurons in the hypothalamus to inhibit the decomposition of lipid substances, and controlling the biosynthesis function of human lipid enzymes. Moreover, due to the increase of leptin receptor content, the effect is stronger. Leptin can promote muscle dissolution and reduce fat accumulation [15]. Adiponectin is a kind of highly specific cellular factor that is the most complex and closely related to the level of human insulin resistance. It is an important biological protective factor that causes insulin resistance and hyperglycemia in patients with severe nonalcoholic hyperlipidemia. Adiponectin can reduce the serum insulin resistance of some patients with nonalcoholic fatty liver disease, thus helping to control the synthesis of liver fatty protein, promote the full oxidative synthesis and oxidative decomposition of lipase in the body, and help control the formation of inflammatory factors in the intestine. It also has a certain significant physiological effect on maintaining the insulin sensitivity level of the human body [16]. Wen Xiumei and others used [17] to observe and discuss the physiological effect of acupoint catgut embedding technology on reducing the serum leptin level and adiponectin concentration in rats with nonalcoholic hyperlipidemia liver model, and further studied and analyzed the effective mechanism of acupoint catgut embedding therapy on the prevention and treatment of liver cirrhosis and hyperlipidemia disease with traditional Chinese medicine. The results showed that after acupoint catgut embedding therapy, the serum leptin receptor level of experimental rats was significantly lower than that of the model group, but the serum adiponectin concentration was significantly higher than that of the model group. However, acupoint catgut embedding can improve the level of serum leptin receptor and serum adiponectin to achieve the therapeutic effect on NAFLD.

3.3 Effect of acupoint catgut embedding on improving insulin resistance

In the formation mechanism of "second injury" of NAFLD, insulin resistance will cause lipid precipitation of liver cells, forming a primary injury in the process of disease. Therefore, insulin resistance is also an essential link. Wang Meng et al. and [18] researchers found that NAFLD induction in mice induced by the compulsory hole catgut embedding method can significantly and effectively reduce and inhibit the expression level and gene transcriptional expression activity of JNK-1 gene in mouse insulin receptor resistance cells, and can significantly antagonize or inhibit the synthesis and function of sugar phosphorylation induced by JNK-1 gene cells in mice. Furthermore, it can significantly reduce and inhibit the phosphorylation of Ser307 gene, which induces the insulin receptor substrate of rats, thus improving insulin resistance and lipid metabolism, which may be an important target of acupoint catgut embedding therapy for NAFLD. Zhou Xiaoling [19], et al., observed the effect of catgut embedding at selected points combined with Qianggan Xiaozhi Decoction on the new serum leptin receptor concentration and insulin resistance index in patients with nonalcoholic fatty liver disease (NAFLD). A group of about 100 patients were randomly divided into a group of mandatory group of local catgut embedding, which consisted of Qianggan Xiaozhi diet treatment group (Group A), local catgut embedding treatment research group (Group B), Qianggan Xiaozhi decoction treatment group (Group C), and oral polyene phosphatidylcholine capsule (Group D). Before the initial drug treatment, each insulin patient took blood to check and

record the value of liver function (ALT, AST), reference value of blood lipids (CHOL, TG), serum leptin, fasting blood glucose index, total insulin, cardiac coronary artery CT, and so on, and then counted the insulin resistance index. The results showed that the ALT and AST in the patient group were significantly lower than those in the control group; At the same time, the levels of CHOL and TG in patients were also higher than those in control groups. Therefore, acupoint catgut embedding combined with Qiangxin Xiaozhi Decoction therapy can effectively treat NAFLD by reducing the concentration of serum leptin receptor and increasing insulin resistance, thus improving the sensitivity of hepatocytes to insulin resistance, and then adjusting the body's high fat metabolism.

3.4 Effect of acupoint catgut embedding on inflammatory reaction

The theory of "two strikes" is the disease mechanism considered by NAFLD at present, and "two strikes" is generally due to oxidative stress and lipid peroxidation to produce a large number of lipid peroxides, resulting in an increase in the release of inflammatory factors of stem cells, causing inflammatory reactions of stem cells [20]. Interleukin (IL) - 8, IL-6, TNF- α , the increase and activation of inflammatory cytokines are the main connotation and key link of the "second strike" theory [21]. The increase of IL-6 in the development process of NAFLD led to the muscle and nerve damage of the heart system, insulin resistance and the degree of inflammatory response [22]; TNF- α It has very important and positive biological significance in preventing tumor induction or increasing insulin function and resistance function of the body. Hu Lin et al. [23] studied the prevention and treatment effect and local influence mechanism of acupoint catgut embedding on rats with nonalcoholic fatty liver. The results showed that acupoint catgut embedding can increase the concentration of adiponectin and thus reduce TNF- α To improve the ability of lipid change in heart tissue, significantly reduce the concentration of rat serum superconductivity conversion temperature, glass conversion temperature, ALT, AST, etc., and think that acupoint catgut embedding can be caused by interference with serum ADP and TNF- α The concentration has a corresponding interference effect on NAFLD concentration. The results of scientific research have confirmed that Zhou Xiaoling's hand back and Shu acupoint catgut embedding method can reduce IKK/NF by- κ Inflammation of B information pathway, which effectively controls and reduces TNF downstream of the heart- α , IL-1 β , The production of inflammatory stimulators such as IL-6 effectively reduces the "second blow" to the heart and blocks the progress of NASH [24]. The tissue damage in the process of acupoint catgut embedding and the decomposition and absorption of the implanted thread body as a foreign body in the body can induce immune phagocytosis, activate the autoimmune reaction, and "control inflammation with inflammation" to regulate the balance of inflammatory reaction [25].

4 Discussion and prospect

4.1 Selection of acupoints for catgut embedding treatment of NAFLD

Good clinical efficacy is closely related to the selection of acupoints. At present, there is no unified conclusion on the selection of acupoints for the treatment of NAFLD. NAFLD belongs to the category of "liver addiction", "fat qi" and "hypochondriac pain" in traditional Chinese medicine. However, the high incidence of NAFLD in today's Chinese society is related to bad habits such as improper diet, staying up late, anxiety and depression, and changes in life patterns, resulting in the deficiency of the family, the inability of the spleen and stomach to move heat and moisture, the difficulty of food and water to transform into essence, the endogenous phlegm and dampness, and the accumulation of dampness and turbidity, resulting in the deficiency of soil and wood, which is transmitted as liver disease, and the disorder of the metabolism of qi, blood and body fluid, resulting from the disorder of liver and wood, Therefore, this disease occurred. The disease is located in the liver, but in fact it

originates from the spleen. In addition, the clinical manifestation of NAFLD patients is mainly the accumulation of fat blocks in the waist and abdomen on both sides, "where the meridians pass, the main treatment is", and the acupoints for catgut embedding are also selected from the spleen and stomach meridians along the abdomen, such as Tianshu, Daheng, Zusanli, Fenglong, Yinlingquan, etc. In addition, because "Yin and Yang meridians, Qi intersect, and viscera, abdomen and back, and Qi connect", the absorption of qi in viscera and meridians, Shu-Mu points can be connected with each other. In clinical medicine, the acupoints, Shu-Mu points, are often taken for catgut embedding injection to treat this disease, such as liver meridian shu, spleen shu, stomach shu, Tianshu, Zhongwan, Zhangmen, Guanyuan, etc. There is a systematic review and meta-analysis of studies on acupoint catgut embedding alone or in combination to treat NAFLD patients with transaminase abnormalities. A total of 15 studies including 1349 patients were included, and more than half of the studies selected common acupoints, including Ganshu (73.33%), Zhongwan (60%), Fenglong (60%), Tianshu (53.33%), Pishu (53.33%) and Zusanli (53.33%) [26]. Acupoint catgut embedding emphasizes the simplification of acupoint selection, the use of as few acupoints as possible, and the maximum effect. Therefore, some scholars put forward the idea of "making good use of acupoint penetration". A needle penetrates multiple acupoints, producing greater stimulation, and playing the synergy of multiple acupoints, so that the meridians and qi can be connected, and its effect must be fast. Therefore, clinical doctors need to conduct catgut embedding through long-term clinical practice and research to summarize effective and sensitive acupoint matching [27].

4.2 Effect of acupoint catgut embedding parameters on NAFLD

Human skin layers, from shallow to deep, include epidermis, dermis, oil layer, fascia layer and tendon layer. Different buried layers have certain differences in the efficacy of NAFLD. Yan Xiaoyue et al. [28] found that in the treatment of NAFLD patients with phlegm and dampness in the muscular layer, the scores of TC, TG, ALT, AST and B-ultrasound were lower than those of patients with fatty layer, and the CT value of liver was higher than those of patients with fatty layer ($P < 0.05$). They believed that the effect of acupoint catgut embedding in the muscular layer was the best. Too short interval of catgut embedding at acupoints will cause inconvenience to patients' life and affect compliance, and too long interval will also hinder the consolidation of curative effect. Therefore, the time of catgut embedding in the retrieved medical experimental data is very different, but there is no data to record the length, thickness and how to affect the effect of catgut embedding at selected acupoints on NAFLD. Therefore, it is necessary to conduct a large sample of randomized controlled trials on the length, thickness Study the period and embedding level to guide the standardization and effectiveness of clinical application. The method of acupoint catgut embedding acupuncture therapy is to further effectively extend the traditional health care therapy of the motherland, acupuncture therapy, and disease treatment. It combines the advantages of multiple therapeutic methods (acupuncture, needle embedding, blood pricking, etc.) and multiple medical effects, and has the outstanding advantages of making the drug more stimulating, the effect can be maintained for a long time, and no other side effects of adverse biopathological stimulation that significantly affect the human body, The curative effect is significant and the treatment cycle interval is longer, which is more in line with the busy life rhythm of modern people. To sum up, due to the outstanding therapeutic effect of acupoint catgut embedding in the treatment of NAFLD, a large number of experimental and clinical research results have been obtained, and it has been preliminarily found that acupoint catgut embedding can prevent and cure NAFLD by improving the resistance to IR, adjusting human lipid metabolism, adjusting inflammatory reaction and other mechanisms, which has a good application prospect.

At present, some of the research results are still facing or have the following technical deficiencies:

① The study of liver tissue lesions and staging spectrum is mainly divided into simple abnormal deposition or change of liver and kidney lipids, NASH, liver fibrosis, etc. Due to the many problems of the results obtained in the study, it has not been possible to include all the studies in a specific and clear expression and form into the atlas study of the age stages and stages of the onset of patients in each clinical stage; ② It is frequently associated with liver and kidney hypermetabolism syndrome, type 2 diabetes, cardiovascular and cerebrovascular disease complications and other complications, but at present, domestic patients are currently conducting a large number of related drug treatment research and clinical pre intervention treatment research work are lack of clinical follow-up tracking and investigation for the diagnosis results of this type of disease to clarify the effectiveness of post intervention treatment. Moreover, the main domestic researchers have only systematically investigated the normal metabolic level indicators of the liver and kidney function indicators and the total blood glucose and hyperlipemia indicators of the patients. At present, many related indicators such as the blood glucose, blood pressure, uric acid and excretion level of the patients have not been effectively included in the evaluation of the whole clinical efficacy. There is also a relatively lack of research on the comprehensive and quantitative effect evaluation of the effect of the whole-process buried line monitoring of virus on the medium and long-term follow-up of the sample virus carriers after prevention and treatment; ③ There are too many pre-operative clinical research data for the application of syndrome differentiation treatment of oncosis and the lack of such data make the modern basic Chinese medicine treatment diagnosis and the standardization of the technical standards and the application of basic theories more systematic, and the process of acupoint selection and compatibility of acupoint embedding parameters of traditional Chinese medicine more complicated. Lack of scientific matching and application research to achieve the best effect of clinical medication and the necessary selected drug acupoint parameters, and clinical application of drug acupoint catgut embedding parameter configuration, and comprehensive evaluation of clinical research and application; ④ The basic mechanism of the pathological changes of the disease is still considered to be very difficult and complex. The main inducing factors should be insulin receptor resistance, disorders and disorders of muscle tissue function and metabolism, mitochondrial dysfunction, abnormal stress of endoplasmic reticulum, abnormal oxidative stress of oxidase, abnormal activation of inflammation, and flora in the digestive tract. All of these factors have participated in the development of NAFLD. At present, there are still few reports on the mechanism of acupoint catgut embedding therapy for NAFLD, and it lacks systematicness and integrity.

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