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Effects of Acupoint Catgut Embedding Combined with Auricular Point Pressing with Beans on Self-Efficacy of Symptom Management and Quality of Life of Patients with Nonalcoholic Steatohepatitis of Liver Depression and Spleen Deficiency Type

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Abstract: *Objective:* To explore the effects of acupoint catgut embedding combined with auricular point pressing with beans on symptom management self-efficacy and quality of life in patients with nonalcoholic steatohepatitis (NASH) of liver depression and spleen deficiency type. *Methods:* Sixty patients with NASH of liver depression and spleen deficiency type admitted to our hospital from January 2021 to December 2023 were selected and divided into an acupoint catgut embedding group (n=30) and a combined group (n=30) using the envelope lottery method. The acupoint catgut embedding group received acupoint catgut embedding intervention, while the combined group received auricular point pressing with beans on the basis of the acupoint catgut embedding group. The two groups were compared in terms of TCM syndrome scores, symptom management self-efficacy [Chronic Disease Self-Efficacy Scale (CDSES)], and quality of life [Chronic Liver Disease Questionnaire (CLDQ)]. *Results:* After intervention, the combined group had lower TCM syndrome scores for both primary and secondary symptoms compared to the acupoint catgut embedding group ($P < 0.05$). The combined group also had higher scores in all dimensions and total score of the CDSES compared to the acupoint catgut embedding group ($P < 0.05$). Similarly, the combined group had higher scores in all dimensions and total score of the CLDQ compared to the acupoint catgut embedding group ($P < 0.05$). *Conclusion:* Acupoint catgut embedding combined with auricular point pressing with beans can effectively improve TCM symptoms, enhance symptom management self-efficacy, and improve quality of life in patients with NASH of liver depression and spleen deficiency type.

Keywords: Nonalcoholic steatohepatitis; Liver depression and spleen deficiency; Acupoint catgut embedding; Auricular point pressing with beans; Symptom management; Self-efficacy; Quality of life

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1. Introduction

Nonalcoholic steatohepatitis (NASH) is a metabolic disorder primarily characterized by fatty degeneration of liver parenchymal cells, with a higher incidence among obese populations [1]. In traditional Chinese medicine (TCM), NASH is categorized as "liver addiction," "fullness," and "hypochondriac pain," with pathogenesis including liver Qi stagnation, spleen dysfunction, Qi and blood stagnation, and liver blood stasis. The phrase "all diseases arise from Qi" and the emotions' effects on organs (anger hurts the liver, joy hurts the heart, excessive thinking hurts the spleen, grief hurts the lungs, and fear hurts the kidneys) suggest that NASH is associated with negative emotions such as irritability and anxiety [2]. Therapeutic interventions can focus on dredging meridians, soothing the liver and relieving depression, and promoting Qi and blood circulation. Acupoint catgut embedding is an extension and development of acupuncture therapy. It stimulates meridians at specific acupoints using needles and medicinal threads to harmonize Qi and blood and balance Yin and Yang. This therapy offers advantages such as painlessness, long-lasting effects, relaxing muscles and dredging meridians, and strengthening the body's resistance to eliminate pathogens [3]. Auricular point pressing with beans is a TCM therapy that involves applying appropriate pressure, such as pressing, pinching, rubbing, and massaging, to auricular acupoints with seeds of *Vaccaria segetalis* or other seeds attached using adhesive tape. This therapy can connect meridians and promote Qi and blood perfusion. Currently, it has been applied to intervene in diseases such as diabetes and insomnia, with promising results [4]. However, there are still limited reports on whether this therapy can be used as an adjuvant intervention for NASH. This study explores the effects of acupoint catgut embedding combined with auricular point pressing with beans on symptom management, self-efficacy, and quality of life in patients with NASH of liver depression and spleen deficiency type.

2. Objects and methods

2.1. Study objects

Sixty patients with NASH of liver depression and spleen deficiency type admitted to the hospital from January 2021 to December 2023 are selected. According to the "Expert Consensus on the Diagnosis and Treatment of Nonalcoholic Fatty Liver Disease with Traditional Chinese Medicine (2017)," the primary symptoms associated with liver depression and spleen deficiency include fullness or wandering pain in the right hypochondrium, often induced by emotional distress such as irritability or anger, dull pain in the liver region, and abdominal distension [5]. Secondary symptoms include abdominal distension, fatigue, chest tightness, loose stools, abdominal pain with a desire to defecate, and frequent sighing. Tongue and pulse manifestations typical of liver depression and spleen deficiency include a pale tongue with tooth marks on the edges, a thin white or greasy tongue coating, and a taut or taut and thin pulse. For Western medicine, diagnostic criteria refer to the Guidelines for the Prevention and Treatment of Nonalcoholic Fatty Liver Disease (2018 Updated Edition). Inclusion criteria were as follows: meeting both the TCM and Western medicine diagnostic standards; liver-to-spleen CT attenuation ratio ≤ 1; no history of alcohol consumption or alcohol intake less than 140 g per week for males and less than 70 g per week for females; histopathological confirmation of diagnosis; and provision of informed consent. Exclusion criteria included patients with viral or drug-induced hepatitis, those receiving total parenteral nutrition, individuals with hepatolenticular degeneration, pregnant or breastfeeding women, and those with inflammatory skin diseases, diabetes, or other conditions affecting subcutaneous tissue absorption and repair, rendering catgut embedding inappropriate.

2.2. Methods

The acupoint catgut embedding group received acupoint catgut embedding intervention. The selected acupoints included Tianshu (ST25), Zhongwan (CV12), Fenglong (ST40), Qihai (CV6), Ganshu (BL18), Taichong (LR3), Zusanli (ST36), and Sanyinjiao (SP6). Specific intervention steps: routinely disinfect the acupoints with 75% alcohol, evaluate the thickness of the acupoints, select a 2cm sheep intestine thread, insert the thread into the acupoints using a disposable 7-gauge catgut embedding needle, slowly withdraw the needle after embedding into the corresponding acupoints, and disinfect the surrounding skin. If accompanied by diarrhea, add Juxu (ST37). If accompanied by rib distension, add Taichong (LR3). Catgut embedding frequency is once per week for a total of 12 weeks.

The combined group received auricular point pressing with beans based on the acupoint catgut embedding group. Selected auricular acupoints included Shenmen, Liver, Gallbladder, Stomach, Spleen, Kidney, Endocrine, and Large Intestine. *Vaccaria segetalis* seeds are attached to the corresponding auricular acupoints, pressed in a spiral manner until the patients felt sourness, distension, numbness, or slight pain accompanied by a sensation of Qi. Each pressing session lasted 2–5 minutes. The *Vaccaria segetalis seeds* are replaced every 2 days, with interventions performed 3 times per week for a total of 6 weeks.

2.3. Observation indicators

(1) Scores of traditional Chinese medicine (TCM) syndromes

Referring to the relevant standards in the expert consensus on the diagnosis and treatment of nonalcoholic fatty liver disease with TCM, the scores of TCM syndromes for NASH patients in the two groups are evaluated before and after 12 weeks of intervention [5]. The primary symptoms included distension and pain in the right hypochondrium, while the secondary symptoms included loose stools, fatigue, and thin or greasy tongue coating. Scoring principles are conducted according to normal, mild, moderate, and severe levels. the primary symptoms are scored as 0, 2, 4, and 6 points, respectively, and the secondary symptoms are scored as 0, 1, 2, and 3 points, respectively.

(2) Self-efficacy in symptom management

The Chronic Disease Self-Efficacy Scale (CDSES) is used to evaluate the self-efficacy in symptom management of NASH patients in the two groups before and after 12 weeks of intervention [7]. The evaluation mainly focused on six items which are: medication compliance, self-care, emotional control, reasonable rest, management of health problems, and pain and discomfort control. Each item could be scored from 0 to 10, and the score was directly proportional to self-efficacy, meaning that a lower score indicated poorer self-efficacy.

(3) Quality of life

The Chronic Liver Disease Questionnaire (CLDQ) is used to assess the quality of life of NASH patients in the two groups before and after 12 weeks of intervention [8]. The CLDQ is a specialized scale for quantifying the stages of liver disease, specifically evaluating six items: abdominal symptoms, fatigue, systemic symptoms, activity, emotions, and anxiety, with a total of 29 entries. The score for each evaluation item is inversely proportional to severity and directly proportional to quality of life.

2.4. Statistical methods

The study used SPSS 25.0 to analyze the data. Normally distributed measurement data are expressed as ($\bar{x} \pm s$),

and independent sample t-tests are used for intergroup difference analysis. Count data are expressed as [number (%)], and chi-square tests were used for difference analysis. A P-value < 0.05 is considered statistically significant.

3. Results

3.1. Comparison of general information between the two groups

There were no significant differences in general information between the two groups, indicating comparability (P > 0.05), as shown in **Table 1**.

Table 1. Comparison of general information between the two groups [cases (%), $\bar{x} \pm s$]

Group	Number of cases	Age (years)	Gender (cases)		Duration of illness (years)	BMI (kg/m^2)	Classification of fatty liver disease		
			Male	Female			Mild	Moderate	Severe
Combined group	30	44.62 ± 5.73	21 (70.00)	9 (30.00)	3.40 ± 0.81	26.60 ± 2.89	11 (36.67)	17 (56.67)	2 (6.67)
Acupoint catgut Embedding group	30	43.98 ± 6.03	22 (73.33)	8 (26.67)	3.55 ± 0.93	26.67 ± 2.73	13 (43.33)	15 (50.00)	2 (6.67)
t/c^2		0.421	0.082		0.666	0.096	0.292		
P		0.675	0.774		0.508	0.924	0.864		

*BMI: Body Mass Index

3.2. Comparison of TCM syndrome scores between the two groups

The TCM syndrome scores of the combined group after intervention were lower than those of the acupoint catgut embedding group (P < 0.05), as shown in **Table 2**.

Table 2. Comparison of TCM syndrome scores before and after intervention between the two groups (scores, $\bar{x} \pm s$)

Group	Number of cases	Right hypochondriac distension		Wandering pain		Loose stool	
		Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention
Combined group	30	3.93 ± 0.61	1.88 ± 0.46*	3.34 ± 0.57	1.36 ± 0.39*	2.28 ± 0.31	1.05 ± 0.26*
Acupoint catgut embedding group	30	3.89 ± 0.58	2.37 ± 0.50*	3.32 ± 0.59	2.05 ± 0.43*	2.24 ± 0.29	1.53 ± 0.32*
t		0.260	3.950	0.134	6.510	0.516	6.376
P		0.796	< 0.001	0.894	< 0.001	0.608	< 0.001

Group	Number of cases	Fatigue		Thin white or greasy tongue coating	
		Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention
Combined group	30	2.17 ± 0.32	0.98 ± 0.25*	2.09 ± 0.30	1.16 ± 0.22*
Acupoint catgut embedding group	30	2.13 ± 0.27	1.34 ± 0.28*	2.01 ± 0.26	1.41 ± 0.27*
t		0.523	5.253	1.104	3.932
P		0.603	< 0.001	0.274	< 0.001

*Note: Compared with the acupoint catgut embedding group, *P < 0.05.

3.3. Comparison of self-efficacy between the two groups

The scores of each dimension and total score of CDSES in the combined group after intervention were higher than those in the acupoint catgut embedding group ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of CDSES scores before and after intervention between the two groups (scores, $\bar{x} \pm s$)

Group	Number of cases	Compliance with Medication		Self-care		Emotional control	
		Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention
Combined group	30	3.85 ± 0.54	5.97 ± 0.64*	3.67 ± 0.45	6.29±0.66*	3.24 ± 0.70	5.89 ± 1.02*
Acupoint catgut embedding group	30	3.87 ± 0.59	5.16 ± 0.62*	3.75 ± 0.49	5.32±0.60*	3.51 ± 0.68	5.05 ± 0.86*
t		0.137	4.979	0.659	5.956	1.515	3.448
P		0.892	< 0.001	0.513	< 0.001	0.135	0.001
Group	**Number of cases**	**Reasonable rest**		**Managing health issues**		**Pain and discomfort control**	
		Before intervention	**After 12 weeks of intervention**	**Before intervention**	**After 12 weeks of intervention**	**Before intervention**	**After 12 weeks of intervention**
Combined group	30	3.91 ± 0.71	7.82 ± 0.88*	4.03 ± 0.63	8.12 ± 0.7*8	3.01 ± 0.46	7.58 ± 0.75*
Acupoint catgut embedding group	30	3.96 ± 0.73	6.74 ± 0.79*	4.11 ± 0.60	7.09 ± 0.66*	3.13 ± 0.42	6.65 ± 0.69*
t		0.269	5.002	0.504	5.521	1.055	4.998
P		0.789	< 0.001	0.616	< 0.001	0.296	< 0.001
Group	**Number of cases**	**Total score**					
		Before intervention	**After 12 weeks of intervention**				
Combined group	30	21.71 ± 6.72	41.67 ± 8.35*				
Acupoint catgut embedding group	30	22.33 ± 6.48	36.01 ± 8.07*				
t		0.364	2.670				
P		0.717	0.010				

*Note: Compared with the acupoint catgut embedding group, *$P < 0.05$.

3.4. Comparison of quality of life between the two groups

The scores of each dimension and total score of CLDQ in the combined group after intervention were higher than those in the acupoint catgut embedding group ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of CLDQ scores before and after intervention between the two groups (scores, $\bar{x} \pm s$)

Group	Number of cases	Abdominal symptoms		Fatigue		Systemic symptoms	
		Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention	Before intervention	After 12 weeks of intervention
Combined group	30	3.14 ± 0.56	5.08 ± 0.61*	3.07 ± 0.55	4.62 ± 0.49*	2.88 ± 0.73	4.39 ± 0.58*
Acupoint catgut embedding group	30	3.17 ± 0.52	4.50 ± 0.57*	3.11 ± 0.43	4.20 ± 0.47*	2.94 ± 0.69	3.92 ± 0.61*
t		0.215	3.805	0.314	3.388	0.327	3.058
P		0.831	< 0.001	0.755	0.001	0.745	0.003
Group	**Number of cases**	**Activity**		**Emotion**		**Anxiety**	
		Before intervention	**After 12 weeks of intervention**	**Before intervention**	**After 12 weeks of intervention**	**Before intervention**	**After 12 weeks of intervention**
Combined group	30	3.82 ± 0.66	5.19 ± 0.52*	3.43 ± 0.50	5.57 ± 0.48*	2.99 ± 0.43	5.07 ± 0.54*
Acupoint catgut embedding group	30	3.85 ± 0.63	4.73 ± 0.58*	3.45 ± 0.53	5.05 ± 0.51*	3.06 ± 0.47	4.42 ± 0.49*
t		0.180	3.234	0.150	4.067	0.602	4.882
P		0.858	0.002	0.881	< 0.001	0.550	< 0.001
Group	**Number of cases**	**Total score**					
		Before intervention	**After 12 weeks of intervention**				
Combined group	30	19.33 ± 3.15	29.92 ± 3.78*				
Acupoint catgut embedding group	30	19.58 ± 3.23	26.82 ± 3.52*				
t		0.304	3.287				
P		0.763	0.002				

*Note: Compared with the acupoint catgut embedding group, *$P < 0.05$.

4. Discussion

Auricular point pressing with beans is a traditional Chinese medicine therapy based on the holographic theory of traditional Chinese medicine and modern anatomical knowledge. It works by stimulating positive response points on the auricle using small round objects, such as cowherb seeds, to unblock meridians and enhance the function of internal organs. It can exert effects such as promoting blood circulation to remove blood stasis, promoting Qi and blood circulation, clearing heat and detoxifying, and improving spleen and stomach weakness. It has advantages such as low cost, convenience and comfort, wide range of effects, and strong operability [9]. However, whether it can effectively intervene in NASH remains to be verified. Acupoint catgut embedding is a special acupuncture therapy that has been proven to promote the improvement of lipid metabolism disorders [10]. However, whether

acupoint catgut embedding combined with auricular point pressing with beans can further improve the symptoms of NASH patients and enhance patients' self-efficacy and quality of life in symptom management still needs to be further studied.

The research results showed that the scores of traditional Chinese medicine (TCM) syndromes such as right hypochondriac distension, loose stool, and fatigue were lower in the combined group after intervention compared to the acupoint catgut embedding group, indicating that acupoint catgut embedding combined with auricular point pressing with beans can effectively improve TCM symptoms in patients with NASH. The analysis of the reasons is as follows: The TCM pathogenesis of NASH is liver depression and spleen deficiency, with adverse emotions stagnating internally and Qi and blood congestion. Acupoint catgut embedding includes acupoints such as Tianshu, Ganshu, Taichong, and Sanyinjiao. Tianshu belongs to the Foot Yangming Stomach Meridian. Stimulating Tianshu can regulate the spleen and stomach, relax muscles, and activate meridians, effectively relieving "liver depression and spleen deficiency." Ganshu belongs to the Bladder Meridian of the Sun. Stimulating Ganshu can relieve liver depression, regulate liver and kidney, clear heat and disperse wind, and clear dampness and heat, which can be targeted at "hypochondriac distension."

Stimulating Taichong has the effects of soothing liver and regulating Qi, clearing heat and purging fire, and clearing liver and gallbladder, which can effectively improve the symptoms of "Qi and blood congestion." Sanyinjiao is the intersecting point of the liver, spleen, and kidney meridians. Stimulating Sanyinjiao can also improve "chest and hypochondriac fullness and pain." In auricular point pressing with beans, Wangbuliu seeds are the dry and mature seeds of *Vaccaria segetalis*, which belong to the liver and stomach meridians and have the effects of promoting blood circulation and dredging meridians, and facilitating blood circulation. Using Wangbuliu seeds to spirally press on the acupoints of liver, gallbladder, stomach, spleen, kidney, endocrine, and large intestine on the auricle is beneficial for activating meridians and promoting the improvement of TCM symptoms in patients with NASH.

The results also showed that the scores of each dimension and the total score of CDSES in the combined group were higher than those in the acupoint catgut embedding group after intervention, suggesting that acupoint catgut embedding combined with auricular point pressing with beans can effectively improve the self-efficacy of symptom management in patients with NASH. The long-term accumulation of adverse emotions causes poor circulation of Qi and blood and spleen and stomach disorders, which are important pathogeneses of NASH.

Acupoint catgut embedding includes acupoints such as Qihai and Zusanli. Qihai is a major acupoint on the Ren meridian, where "Qi" refers to zongqi and the Qi of water and grains. It can convert the essence of water and grains into zongqi through regulating respiration, which gathers at Qihai. Stimulating Qihai can invigorate Qi and tonify the spleen, promote urination and drenching, promote blood circulation and remove blood stasis, and regulate the lower Jiao, which helps improve the mood of patients with NASH and resolve stagnation. The superficial layer of Zusanli has cutaneous nerves passing through, and the deep layer has anterior tibial arteries and veins. "When pathogens are in the spleen and stomach, there is excess of both Yin and Yang, or deficiency of both, which leads to cold or heat symptoms. All these can be regulated by Zusanli," indicating that Zusanli is associated with the spleen and stomach. Stimulating Zusanli can tonify the spleen and stomach, promote Qi circulation and reduce distension, digest food and resolve accumulation, tonify Qi and warm the middle to dispel cold, which is beneficial for patients with NASH to resolve Qi and blood stagnation caused by adverse emotions and improve self-efficacy. Auricular point pressing with beans is easy to operate and can be performed under the guidance of a doctor, which is conducive to improving self-efficacy in symptom management.

The results also showed that the scores of each dimension and the total score of CLDQ in the combined group were higher than those in the acupoint catgut embedding group after intervention, indicating that acupoint catgut embedding combined with auricular point pressing with beans can effectively improve the quality of life of patients with NASH. Acupoint catgut embedding also includes acupoints such as Zhongwan and Fenglong. Zhongwan is an important acupoint on the Ren meridian. Stimulating Zhongwan can harmonize the stomach and tonify the spleen, regulate stomach Qi, regulate emotions, improve sleep, and descend adverse Qi, and promote diuresis. Fenglong is a connecting point of the Stomach Meridian of Foot-Yangming, which connects the spleen and stomach meridians. Stimulating Fenglong can tonify the spleen and stomach and improve the abnormal circulation of Qi and blood. Auricular point pressing with beans includes not only liver and spleen acupoints but also endocrine and large intestine acupoints. The auricular points have high sensitivity, and the auricular holographic acupoints have strong correspondence with related organs and tissues of the body. Auricular point pressing with beans can tonify the spleen and eliminate diseases, which is conducive to improving the quality of life.

5. Conclusion

In summary, acupoint catgut embedding combined with auricular point pressing with beans can effectively alleviate the TCM symptoms of patients with liver depression and spleen deficiency type NASH, and improve self-efficacy in symptom management and quality of life.

Disclosure statement

The author declares no conflict of interest.

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