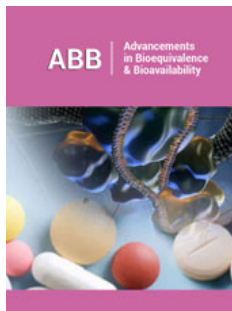


Stagnated Liver-Qi-Based Insights into the Effects of Vinegar-baked Radix Bupleuri

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Abstract

Pattern is the key concept in the TCM, acupuncture, and acupressure; therefore, pattern differentiation is viewed as one of the foundations of TCM treatment for diseases. Liver qi stagnation is the most common pattern in clinic that can result in many diseases and symptoms, which can be treated with Radix Bupleuri. Scientific evidence shows that Vinegar-baked Radix Bupleuri can drain the dampness with the warm of vinegar to keep Liver from the damage for free flow of Liver qi.

Keywords: Pattern; Liver qi stagnation; Vinegar-baked Radix Bupleuri

Introduction

The unique theories of Ying-Yang, Zang-Fu, the Five Element, and pattern identification in the Traditional Chinese Medicine (TCM) are derived from the observation of the nature and based on the inductive logic reasoning, which makes TCM absolutely different from the Western medicine. The concept of Yin-Yang balance indicates the harmony of internal organs and is the dominating key of the TCM which has served as the foundation and the guideline for explaining etiology of diseases and treatments throughout the history of Chinese medicine for over two thousand years [1]. Based on this concept, which is believed to absolutely distinguish TCM from the Western medicine, a disease presents the loss of the balance of Yin-Yang [2].

Yin	Yang
Blood	Qi
Material	Function
Zang	Fu
Yin meridian	Yang meridian

Figure 1: Characteristics of Yin and Yang.

Since diseases are seen as the imbalance between Yin and Yang in Figure 1, no good results can be expected without the consideration of Yin and Yang [1]. In terms of balancing Yin and Yang, this goal can be achieved by stimulations through techniques, such as Chinese herbs, the stimulations at acupoints through the acupuncture, moxibustion, acupressure, Tui Na, and cupping. Liver classified as Yin in the TCM Yin-Yang theory is an important Zang organ. The warning "Liver is the trigger of the diseases and the invader into the five Zang organs and six Fu organs" presented in the ancient TCM literature highlights the importance of Liver. The study tries to understand the effects of Vinegar-baked Radix Bupleuri in the pattern of Liver qi stagnation.

What liver qi stagnation refers to

Among all the patterns related to Liver from the perspective of etiology of the TCM, Liver qi stagnation is absolutely the most common causative pattern in practice. Etiology and the Five Elements theory of the TCM indicate that anger and related negative emotions like

worry, resentment, fear, disappoint, and frustration, etc. are closely attributed to Liver. One of the functions of Liver is the regulation of the free and smooth flow of Qi, which can easily control a person's emotional states. Conversely, negative emotions can affect significantly Liver and disrupt the smooth flow of Qi in the body to cause Blood stasis and Blood deficiency finally impairing the consistence of Zang-Fu organs. In other words, stagnation of Qi easily occurs when Liver qi cannot flow freely.

On the other hand, stagnated Liver Qi will impede the circulation of Qi and Blood to cause emotional states, such as constant anger, depression, and complaint on the basis of Blood deficiency. One can feel the lump in the throat, have headaches, tension in the stomach and swelling sensation in the breasts, be prone to lose the temper, in addition to feelings of tightness/pain around the chest and hypochondriac region with frequent sighing [3]. Each Zang-Fu organ has Yin-Yang components. Scientific researches on Liver qi stagnation show that the decrease in cAMP may correspond to Yang deficiency indicating the functions of the organs are impaired while the number of cAMP increases can be seen as Yin deficiency, meaning the shortage of substances [4]. In addition, the sympathetic nervous system classified as Yang controls the Natural Killer cells capable to attack malignant cells while the parasympathetic nervous system viewed as Yin is believed to control the Natural Killer cells for the release of cytotoxic substances [5,6].

The response to stress which is greatly presented with the symptoms of the nerve system is one of the functions of Liver in the TCM. Experimental evidence in Yang deficiency in the Liver qi stagnation demonstrates that the dysregulation of neurotransmitter is closely associated with depression from the aspect of Western medicine [7]. Blood nourishes Qi and Qi moves Blood. The concept Qi is the commander of Blood and Blood is the mother of Qi in the TCM suggests one is inconceivable without the other, Blood circulation can benefit the tissues to fight with inflammation, which can be impaired with the stagnated Qi [8]. Inflammation in the theory of TCM is classified as Fire, which can be caused by stagnated qi [9]. Interleukin-6 is produced when the tissue injuries and the infections occur. The number of interleukin-6 increased in patients with acute pancreatitis of Liver qi stagnation pattern with Chinese formula Daichahu decoction to disperse stagnated Liver qi [10]. Women at reproductive age are likely to be affected with endometriosis that is the symptoms of pelvic inflammation. Blood stasis caused with stagnated Liver qi can cause Fire resulting in the accumulation of Damp-heat. Uses of Chinese herbs like Semen persicae, Radix ec rhizoma rhei, etc. have shown to be effective in significantly decreasing the prostaglandin F 1 α (PGF1 α) levels and increasing the level of β -endorphin and the ratio of 6-keto- PGF1 α / thromboxane B 2 (TXB2) in the patients with Liver qi stagnation [11].

Quick look at the effects of processed Radix Bupleuri

Accurate processing can adjust the nature of heat, warm, cool, and cold of a Chinese herb to equilibrate the balance of Yin-Yang because a disease is understood to be the imbalance between Yin and Yang [12]. The nature and indications of Chinese herbs can be

changed with processing. The processing is the unique technique developed by the ancient TCM masters for facilitating the use of Chinese herbal medicines to meet the specific clinical needs, such as detoxification. Either a crude or a processed herb can be selected for the clinical use for the expected outcomes to meet the patients' needs, based on the Yin-Yang of the diseases and a patient's constitution.

Commonly used processing techniques to guarantee the effectiveness and the safety are baking, steaming, boiling, stewing, cutting, roasting, stir-frying with/without liquid/solid excipient, water trituration, and crushing. In addition, excipients like yellow rice wine, honey, and vinegar are often added to the raw herbs to reinforce the efficiency among these methods [13]. In terms of treating diseases related to the Liver, it is beyond doubt that Radix Bupleuri (RB), also called Chaihu in Chinese, is derived from the dried roots of *Bupleurum chinense* DC. (Pei Chaihu) and *Bupleurum scorzonerifolium* Willd (Nan Chaihu) and one of the most popular and the key TCM herbs frequently used in the most famous Chaihu-related preparations like Xiao Yao San, Da Chai Hu decoction, and Xiao Chai Hu decoction. The major difference between *Bupleurum scorzonerifolium* and *Willd Bupleurum chinense* DC. lies in the indication of *Bupleurum chinense* DC. which is used for dispersing stagnated Liver qi while *Bupleurum scorzonerifolium* Willd is to raise Yang Qi in the pattern of Middle Jiao deficiency [14].

Vinegar-baked, crude, or fried Radix Bupleuri commonly selected for clinical purposes bears the properties of spicy, cool, and bitter and was initially recorded in 200 AD in the well-known TCM classic of Shennong-bencao-jing. Radix Bupleuri is usually selected to promote Yang and Qi for the hepatoprotective purpose for regulating the interior and exterior metabolism through soothing Liver qi and dispersing evil Heat for the antiviral, antimicrobial, anti-inflammatory, anticancer, and immunomodulatory functions [15-17]. Vinegar made primarily from fermented wheat, millet, sorghum, or rice has health benefits for the medicinal use in the TCM. In the TCM theory, the flavors of vinegar are sour and bitter with the warm nature, entering the Liver and Stomach meridians with the functions of stopping bleeding, scattering stasis, and resolving toxins. In the professional TCM use, many herbs are stir-fried in vinegar in order to target on Liver or Gallbladder or increase the functions of moving Qi and quickening Blood [18]. With the increasing amount of vinegar when the Radix Bupleuri is baked with vinegar, Saikosaponin b2 assumed to be the key efficacy component can enhance the hepatoprotective effect as an antagonist of hepatitis C virus, which suggests the amount of vinegar in the processing affects significantly the pharmacological effect [19,20].

Scientific evidence of Radix Bupleuri shows this herb possesses anticancer and antitumor effects. In another study, the clerosterol isolated from vinegar-baked Radix Bupleuri could decrease the cisplatin uptake in BRL cells and the uptake of colchicine in HEK 293 cells by increasing Pgp and Mrp1 activity in treating liver cancer along with the combination with traditional chemotherapy to modify drug transport. It is therefore assumed

that Clerosterol may be an active constituent of vinegar-baked Radix Bupleuri to fight against the cancer multidrug resistance by inhibiting Pgp activity and increasing the drug distribution to the liver to enhance the effects of other drugs on the liver [21,22]. In addition, Saponins isolated from Radix Bupleuri can also exhibit the great anti-proliferative activity in human non-small cell lung cancer A549 cells [23].

Discussion

In general a TCM physician do not follow typical the Western pathological classifications of diseases, but rather depends on the patterns individualized by the imbalance of Yin and Yang that can result in diseases, body fluids in the body, and Qi and Blood. Based on the TCM theory, Blood is classified into Yin and derived mainly from food qi that is produced by the Spleen, the organ Liver easily invades in the Five Elements theory. The three Zang organ are closely connected with Blood that can be affected by the flow of Qi controlled by Liver shown in Table 1 [24]. According to TCM theory, the sour flavor functions to bind and secure. The herbs like Da-huang and bie-jia that are cooked in vinegar can take on a blood stasis dispelling effect. In the TCM, rice vinegar used as an excipient in the processing is bitter, sour and warm. It is stated in the Nei Jing that the collective function is to drain when bitter and sour come together [25].

Table 1: Functions of Zangs related to Blood.

Zang	Functions
Liver	Storing Blood and regulating the volume of Blood
Spleen	Controlling Blood
Kidney	Controlling Bone

Pattern is the key to the treatment in the TCM, acupuncture, and acupressure; therefore, pattern differentiation is viewed as one of the foundations of TCM treatment for diseases. The TCM theories hold that the emotional disorders like anxiety and depression caused by the nerve system are the main characteristics of the liver-qi stagnation pattern. In cases of liver-qi stagnation and spleen deficiency pattern and blood stasis into collaterals pattern, the level of immunoglobulin J-chains is up-regulated. Furthermore, it is also confirmed the SAS score and the SDS score of the patients with liver-qi stagnation and spleen deficiency pattern are significantly higher than those with kidney-yang deficiency pattern, which indicates the main difference between LSSDP patients and KDP patients is the emotional symptoms. [26,27]. In the perspective of TCM, abnormal fluid is defined as Dampness, which can damage the Spleen Yang of the body to stagnate fluids causing Qi stagnation and Blood stasis. Conversely, stagnated Liver qi can invade Spleen to damage its qi. Spleen qi deficiency often compromises the immunity system due to the congestion of the lymphatic system and autoimmune conditions [3].

The current research states that herb like Radix Bupleuri can be used to strengthen Spleen and replenish Qi with the efficacy in hindering the growth of tumors, improving patients' health conditions to decrease the size of tumors, and prolonging their lives with the functions of adjusting the NK cells, strengthening

the function of T lymphocytes, and protect the liver function [28]. Fortunately, Vinegar-baked Radix Bupleuri can drain the dampness with the warm of vinegar to keep Liver from the damage caused by dampness for free flow of Liver qi. Blood circulation benefits the tissues to fight with inflammation that is a critical component of tumour progression. Current evidence confirms that many cancers can arise from sites of inflammation, chronic irritation, and infection. With the literature of oxygen metabolism, the meridian theory, and Qi in the meridians that highlights Qi and oxygen have informational, material, and functional features with the high similarity in physiological functions and pathological reactions, it is suggested that Liver qi should flow freely in order to maintain the systems function properly to stay healthy.

Conclusion

Unfortunately, patterns are seldom discussed or taken into consideration for scientific research designs. In other words, most of the current researches only focus on the diseases, which cannot examine the efficacy of TCM herbs, acupuncture, and acupressure accurately. The Liver qi stagnation pattern covers more diseases and symptoms than those discussed in the Western medicine. On the other hand, the mechanism of the excipients like vinegar in treating cancers still remains uncertain, which deserves more scientific research in the future.

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