

Traditional Chinese Medicine Approaches for the Treatment of Diabetes

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SUMMARY

Traditional Chinese medicine (TCM) offers an integrated approach to manage diabetes and restore balance and function within the body. In centuries-old practices, TCM prospects diabetes as a condition linked to imbalances in the body's Qi (Vital energy), Yin and Yang, rather than just a glucose regulation problem. Diabetes management is based on the key components of TCM including herbal remedies, acupuncture, dietary therapy, and lifestyle modifications. Herbal treatments mainly involve various plants such as *Panax ginseng*, *Momordica charantia*, *Psidium guajava*, and *Lagenaria siceraria*, which are believed to help regulate blood sugar levels, enhance insulin sensitivity, and protect pancreatic function. Acupuncture, in which needles are inserted into specific parts of the human body to activate the functions that gain the flow of Qi and help to overcome the symptoms of diabetes. On the other side, dietary therapy is specialized to provide dietary regimens to manage or prevent metabolic disorders, generously promote body balance and wellness, and neutralize the body's toxins. Along this, yoga and exercise are effective ways to support the alleviation of diabetic-associated illness. Lifestyle interventions are necessary to play a vital role in the management of high blood glucose levels with the help of Tai Chi or Qi Gong and proper sleep. These factors are recommended to get better health. Hence, TCM is a conventional way to provide lifetime therapy and health care plans in case of diabetes and other metabolic disorders. With the most appropriate techniques, TCM is anticipated to control glycemic levels at a normal range.

INTRODUCTION

Traditional Chinese Medicine (TCM) is at least 23 centuries old system that was designed to control or heal disease with the stability of the Yin and Yang balance. It is a seeker of dynamic balance between two forces that are Yin (passive) and Yang (active) in a body to develop good health (Lv et al., 2022; Chen et al., 2023). If this equilibrium is broken or disrupted it can lead to illness (Peng et al., 2022). Yin represents the passive, feminine, and dark aspects of nature, while Yang represents the active, masculine, and light aspects. The following techniques are used in TCM practice: acupuncture, herbal medicine, dietary therapy, massage, and exercise. Herein, the concept of TCM originated more than two

millennia ago to give a novel philosophy about body physiology (Xu et al., 2019; Rizvi et al., 2022).

Traditional Chinese Medicine largely focuses on the immunomodulatory activity of the body. Due to this reason, TCM has prescribed distinguishable kinds of procurement strategies, such as individual treatment plans for every syndrome (Zhang et al., 2020). For a long time, the practitioners of TCM labeled diabetes with a unique kind of name, the Xiao-Ke disease. This word links with a sense of wasting and thirst. Likewise, the TCM also describes the pathogenesis of diabetes mellitus. According to the TCM, it is due to the low level of Yin and inactivity of Qi. Consequently, it causes dryness and excess heat. The symptoms of diabetes are of main concern in traditional Chinese medicines. In the Yellow Emperor's Classic of Internal Medicine, the symptoms of diabetes have three

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excess and one loss. The three excesses include high thirst, hunger, and frequent urination. On the other hand, there is a loss of weight (Ji et al., 2013; Guo et al., 2014; Xu et al., 2019). TCM goes more deeply into the aforementioned disease and provides more information on the names of organs that get affected due to diabetes mellitus. These organs are the lungs, kidneys, and spleen. To move forward, TCM deals with the treatment methodologies of diabetes and other diseases as well (Ai et al., 2020).

Traditional Chinese medicine divides diabetes mellitus into two different types. The types are Pi Dan (obese diabetes) and Xiao Dan (consumptive diabetes). The most frequently observed diabetic condition among the patients is Pi Dan which leads to Xiao Dan in the last stage complications. In the theory of TCM, this type of diabetic condition is usually associated with long-term Yin deficiency syndrome and should be intervened to prevent the last-stage complications. Hence, we can conclude that diabetes can be classified or manifested by four different stages including the heat stage, the injury stage, the deficiency stage, and the stage of inactivity. The three stages, heat stage, deficiency stage, and inactivity stage mainly deal with the diabetic period. On the other hand, the injury stage includes diabetic complications. All these stages have some special kinds of properties. These properties include (i) In the stage of inactivity, the impairment of glucose tolerance coupled with insulin resistance shows prediabetic conditions. (ii) If the above condition persists for a long period of time, it would lead to the heat stage and show different symptoms regarding stomach heat, and lung heat. (iii) Now deficiency stage occurs due to the diabetic deterioration factor and this condition is more frequently seen in clinics. (iv) The last stage that shows the symptoms of chronic diabetes mellitus is the injury stage in DM.

In TCM, if internal heat persists for a long time, it would cause Qi and Yin deficiency. The above-mentioned last injury stage causes damage to the different organs of the body. In a nutshell, different kinds of collateral damage, blood stasis, and other circulatory obstructions have been observed during the whole pathogenesis of diabetes mellitus. So, the main concern of TCM is to treat blood stasis and promote blood circulation by degrading the obstructions caused by the pathway of blood flow. The most common drugs to treat blood stasis are Shuizhi (*Hirudo nipponica* Whitman) and Sanqi [*Panax notoginseng* (Burk.) F.H.Chen]

TCM is increasingly being used around the world as an alternative or complementary treatment to Western medicine. However, the current chapter will give information not only about different aspects that are utilized in TCM but also provide the latest research and review on this context. (White et al., 2018; Kalachaveedu et al., 2023).

ORIGIN OF TRADITIONAL CHINESE MEDICINE

China is renowned as the world's oldest medical system that originates traditional Chinese medicine over thousands of years. From the 3rd century BCE, the earliest known record of TCM in written form is Huangdi neijing [The Yellow Emperor's Inner Classic (Huang et al., 2023)]. With the passage of time, the evolution of TCM incorporated novel ideas to become more standardized. The establishment of the first medical schools happened during the Han dynasty (206 BCE – 220 CE) and a written context related to TCM was available for the first time in the Tang dynasty [618 – 907 CE (Yang, 2023)]. First Committee of Traditional Chinese Medicines was established in 1955. The Chinese government took a major step to promote TCM education and practice and made it an integral part of the health system in China that is approved by the World Health Organization (Hou et al., 2023).

ROLE OF QI IN TRADITIONAL CHINESE MEDICINE

A powerful aspect of TCM is to understand Qi (pronounced "Chee"), an energy that flows through all organs, tissues, cells, veins, nerves, and atoms of the body (Zhang et al., 2023). A healthy body indicates that Qi flows freely and in balance but when this balance is out or broken, then illness can occur (Aplin-Houtz et al., 2023). Qi involves invisible meridians or channels of the body that relate different phenomena like seasons, planetary movements, and circadian rhythms to emphasize the correlation of mind, body, and environment (Ke, 2023).

PRINCIPLES OF TRADITIONAL CHINESE MEDICINE

Based on TCM principles, different diseases and illnesses are diagnosed, prevented, and treated (Liu et al., 2023). These principles are (i) **Yin and Yang**: It is a synchronization of forces among different parts of the body to render it in a stable form and promote health. If any deficiency occurs in this equilibrium, then the disease will come. (ii) **Five elements**: These fundamental elements are wood, fire, earth, metal, and water. Each element is correlated with an organ system, a season, a color, a taste, and an emotion.

DIAGNOSTIC TECHNIQUES

There are four basic methods for TCM diagnosis such as observation, listening and smelling, inquiry, and palpation. Observation includes inspecting the patient's actual appearance, like the variety and surface of the skin, the shape and shade of the tongue, and the state of the hair and nails. Listening and smelling includes paying attention to the patient's voice and smelling their breath and stench for hints of their condition. Inquiry involves getting some information about their

symptoms, clinical history, and way of life propensities. Palpation includes feeling the patient’s heartbeat and abdomen examination (Zhang et al., 2022; Chen et al., 2023).

TREATMENT MODALITIES

Traditional Chinese medicines focus on suggestive treatment which considers the sequence of physiological irregularities rather than evaluating the blood glucose level in diabetic patients. TCM includes several treatment modalities, including acupuncture, herbal medicine, massage (tui na), exercise (qigong), and dietary therapy.

HERBAL MEDICINE

In TCM, the most often utilized treatment is herbal medication which is a natural plant-based remedy to treat several diseases. Depending upon the symptoms and constitution of the specific patient, herbs are combined into formulas in different forms like powder, pills, and tinctures. Insulin and other hypoglycemic agents have a great effect on reducing the severity of diabetes mellitus (DM). TCM is most commonly used in the Pan-Pacific region as an alternative to DM therapies (Salehi et al., 2019; Lin et al., 2022).

To design non-toxic formulas for treatment purposes, different parts of the plant, such as leaves, roots, flowers, fruits, and seeds are used with different extracts. Similarly, some animal products are also used in combination with herbal medicines to enhance the therapeutic effects of the drugs (Aziz et al., 2018). Different decoctions and other combinations are frequently used in treatment therapies to cure diabetes. However, like acupuncture, there are concerns over the safety and effectiveness of herbal remedies. Some herbs may interact with prescription medications or have harmful side effects, and the quality and purity of herbal products are not always regulated (Ekor, 2014; Choudhury et al., 2018; Zheng & Chen 2022).

The formula of the medicinal formulation is considered appropriate if it possesses the following four things (Ekor, 2014). The principal ingredient: It helps in the treatment of the main or the principal pattern of any disease. The associate ingredient: It synergizes the activity of herbal medication and acts as the chief commodity in curing different syndromes. The adjunct ingredient: It synergizes the activity of the chief ingredient and enhances its capability to treat pathologies. The guide ingredient: It plays a significant role in the integration and harmonization of the other ingredients.

Herbal substances to treat diabetes

There are some herbs and along with their chemical constituents that have been used to treat the hyperglycemic condition.

Panax Ginseng

It is also known as Korean ginseng Fig 1. This herb has five different constituents that have an efficient hypoglycemic potential. In addition, it also possesses the ability to combat anxiety conditions and make mood good and happy. The recommended dose for the required outcomes is 100-200 mg per

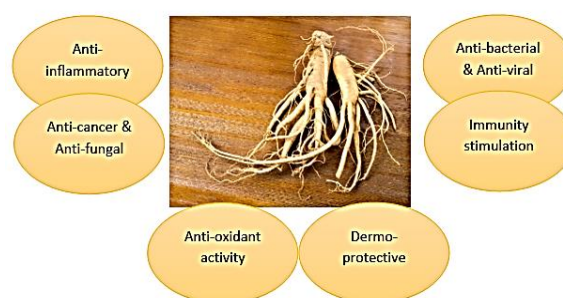


Fig 1. Therapeutic uses of Korean ginseng

day. Apart from the antidiabetic potential it also has other pharmacological significance as well (Chen et al., 2019; Hou et al., 2020).

Momordica charantia

It is also known as balsam pear and is available as dry powdered pills. It has antidiabetic activity by reducing the level of glucose in the blood. A dose of 18 grams per day is useful for the reduction in the blood glucose level.

Pharmacological importance of *Momordica*

On the other hand, apart from antidiabetic activity it also has other therapeutic potentials as well Fig 2. Moreover, some other herbal medicines in the TCM include *Psidium guajava* and *Lagenaria siceraria* (bottle gourd) which have antidiabetic activity as well. The mechanism of action of aforementioned is to increase the use of carbohydrates rather than increasing the level of insulin in the body (Ji et al., 2013; Joseph & Jini 2013; Jia et al., 2017; Kim et al., 2022).



Fig 2. Therapeutic uses of *Momordica charantia*

Precautionary measures

All herbal formulations are considered dietary supplements according to the Dietary Supplement and Education Act. Due to this very reason, these formulations do not need any kind of prior approval from the Food and Drug Administration (FDA). Some of the herbal medicines imported from China contain heavy lead and mercury. Similarly, these medicinal herbs are deliberately adulterated with Western pharmaceuticals, such as benzodiazepines or anti-inflammatory agents. So, precautionary measures are needed prior to their use (Ji et al., 2013).

ACUPUNCTURE

Acupuncture has been proven beneficial in the procurement of a globally acknowledged fatal pathology called diabetes. This therapy has the ability to turn down the level of glucose and regulate endocrine function. In TCM, acupuncture involves the insertion of thin needles into definite points of the body. These points are responsible for corresponding to specific organs or systems within the body, and are believed to restore balance and stimulate healing (Saeedi et al., 2019; Zhang et al., 2022).

For thousands of years, China used acupuncture and its popularity has spread around the globe in recent years. Nowadays, acupuncture is used to treat various conditions, including chronic pain, anxiety, headaches, and digestive disorders (Palatchie et al., 2022). There are several mixed researches about the effectiveness of acupuncture. Some studies reported it to be a useful treatment for certain situations, others studies indicated no significant benefit. Moreover, safety measures should be used when acupuncture is performed by untrained practitioners or when using unsterilized needles (Liu et al., 2023). Acupuncture is used therapeutically to improve pain in different conditions like chronic pain and acute low back pain (Liu et al., 2018; Mao et al., 2021). Diabetes linked to other

complications like “Diabetic peripheral neuropathy, DPN,” is one of them. In this complication, the patient loses feeling of pain or sensorimotor function, so electro-acupuncture is used for treatment (Dietzel et al., 2023).

Acupuncture in diabetes peripheral neuropathy

In addition to pain relief, this therapy proves advantageous to strengthen the body to perform different physical activities, induce a sense of well-being, and help in the maintenance of quality sleep Fig 3. This therapy also proves to strengthen the body to perform different physical activities, and also help to maintain the quality of sleep. Precautionary measures should be used in diabetic patients during the insertion of needles in the lower proximities due to poor blood supply. Additionally, another important type of acupuncture is auricle acupuncture (Ji et al., 2013; Dietzel et al., 2023).

MASSAGE (TUI NA)

Tui na is a type of therapeutic massage for the treatment of musculoskeletal conditions, and internal disorders. It includes numerous techniques, such as kneading, pressing, and stretching, and is based on the principles of TCM (Zhang et al., 2023).

EXERCISE (QIGONG)

Qigong is a kind of exercise, based on the principles of TCM, including breathing, movement, and meditation to stimulate health and well-being. It is used to treat various conditions like anxiety, depression, and stress (Shi et al., 2022).

DIETARY THERAPY

Dietary therapy includes the use of food and nutrition for the treatment of diseases. It is based on the principles of TCM, which is called food medicine (Villarroel, 2022). Diet is the most important factor in the treatment of different illnesses. On the basis of nutritional value, a diet should be prescribed to boost energy production. It is also recommended to the patient that the meals should be small and taken frequently times on a daily basis. These meals contain different seasonal fruits and prevent people from excess and frequent sweating to regulate the water balance (Ji et al., 2013).

CONCLUSION

TCM is increasingly being used around the world as an alternative or complementary treatment to Western medicine. However, despite its popularity, there is still much debate surrounding the effectiveness and safety of TCM practices.

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