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Original Paper

The Cultural Characteristics of Traditional Chinese Medicine Based on History of Learning the Liver When Comparing with Western Medicine

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Abstract

Traditional Chinese medicine (TCM) is regarded as an esoteric and mystical entity, an entity of philosophy, or even an unscientific entity when compared with western medicine. Since TCM has a 5,000 plus year history and is coexisting with modern medicine in China, it is difficult to simply conclude what the cultural characteristics of TCM are. This work analyzed the histories of TCM and western medicine on learning the liver, then revealed the cultural characteristics and the possible development of TCM. The comparison of mythological origin, anatomic history, as well as the framework of medical theory suggest that TCM is far away from a clear-cut subject and awaits more exploration both in theory and in practice: It is a comprehensive system integrating knowledges from multiple fields from ancient China; it emphasizes theory development, with the terms and function of organ are far beyond the organ of itself; and, its basic theoretical framework evolved and has become sort of like universal rule that would not be subsequently falsified. According to the cultural characteristics of TCM, there are four possible future directions for the development of TCM and it will continue to coexist with modern medicine in China for another foreseeable long time.

Keywords

Traditional Chinese medicine, Cultural characteristic, Western medicine, Modern medicine, Liver

1. Introduction

What are the cultural characteristics of traditional Chinese medicine (TCM)? TCM has a 5,000 plus year history and a great impact on other traditional medicines, e.g., Kampo in Japan and Ayurveda in India, which is regarded as an esoteric and mystical entity, an entity of philosophy, or even an unscientific entity when compared with western medicine. Traditional medicine is an often-underestimated part of health services (WHO Library Cataloguing-in-Publication Data, 2023). Till today, TCM is still an existing entity, and coexists with modern medicine in China, it is difficult to simply conclude what the cultural characteristics of TCM are. To shed light on the cultural characteristics of TCM, comparative studies on history and development of TCM and western medicine are fundamental. Literature research found little was available on the historical research on learning history of the liver in TCM. It is necessary to compare the history of learning the liver of TCM with western medicine, and to reveal the cultural characteristics of TCM and the possible development of TCM in China.

2. The History of Learning the Liver in Western Medicine

It was started with myths when people began to learn about liver in conventional western medicine.[2-6] The first myth was about Tityus, who was the son of Zeus, and was punished by Zeus for his crime, and two vultures hunched on either side of him, digging into his liver, beaking deep in the blood sac, and he with his frantic hands could never beat them off. The liver would regenerate overnight, and thus Tityus suffered the same fate every day. Homer refers twice to Tityus. In this case, the liver was thought to be the seat of passion and desire. The punishment may have been regarded as a kind of castration.

The following myth was about Prometheus. Prometheus was condemned by the gods to be tied to a stake for having given fire to mankind, and have an eagle pluck out a piece of his liver each day. The liver would regenerate overnight, and thus Prometheus suffered the same fate every day. The legend of Prometheus was first appeared in Hesiod's poetry. Hesiod was a Greek poet in the 8th-century before the Common Era (BCE). Prometheus became an archetypal culture hero in the West. In this case, the liver was regarded as the seat of life, soul, and intelligence. The indestructibility of the soul was connected to the regenerative capacity of the liver.

It would appear that the ancient Greeks and Romans recognized the ability of liver to generate after a portion of it had been removed, despite the concept of liver regeneration was not introduced until in the early 19th century. The above two myths revealed part physiology of the liver.

Hippocrates (460-377 BCE) practiced ancient Greek medicine. The Hippocratic Corpus named after him were devoted to the four humors: black bile, yellow bile, phlegm, and blood, and explained medical illnesses as an imbalance between the four basic elements. Hippocrates might firstly describe symptoms of hepatic encephalopathy (Bartos, 2014; Wee, 2017; Grover, Tognarelli, Massie, Crossey, Cook, & Taylor-Robinson, 2015).

Galen, a Greek physician active in Rome during the reign of Emperor Antoninus in the second century

Anno Domini (AD), based his theories on anatomic and functional studies performed on apes and pigs. Although dissection of human corpses was forbidden in the Roman Empire, Galen believed that these animals were very similar to humans. He divided the liver into 5 lobes, generated blood, and distributed it to all the body via the vena chili (the inferior vena cava). He also believed that the portal vein distributed purified blood to the stomach, spleen, greater omentum, and jejunum; concurrently, the blood coming from the stomach reached the liver to be purified (Rengachary, Colen, Dass, & Guthikonda, 2009; Galen & DeLacy, 1978; Galen, 1968; Galen, Furley, & Wilkie, 1984; Galen & Singer, 1956; Key, Keys, & Callahan, 1979).

Between the years 200 to 600 AD, the Talmud recorded some of Hippocrates' and Galen's teachings. The liver and head were considered to be of equal importance, hemopoietic properties was attributed to the liver, the liver was the seat of love and the source of anger, and bile was thought to have an internal function of calming the anger generated in the liver and could be considered the first sedative (Westreich, 1990; Rosner, 1969).

The Renaissance (14^{th}-17^{th} century) occurred after the Crisis of the Late Middle Ages and was associated with great social change (Porter, 1997; Johnson, 2000; Toledo-Pereyra, 2005, 2013; Sherozi, 2005).

As autopsy was permitted and microscope was invented in 1590, knowledge began to be corrected according to results of autopsy and microscopy (Bardell, 2004). The anatomy, ultrastructure and physiology of the liver gradually tended to be corrected and to be the foundation of modern hepatology, lots of pioneers made achievements to learn the liver, especially in anatomy of liver, like Leonardo da Vinci, Francis Glisson, Fahricua Hildanus, Hugo Rex, James Cantlie, Hjortsjö C.-H., John E. Healey, Claude Couinaud and so on. The liver function consists of digestion, metabolism, detoxification, coagulation, and immune modulation and so on (Figure 1A).

At the same time, the western medicine gradually evolved to be modern medicine which is based on experimental science and believing in "seeing is believing", although there are still some aspects of anatomy and physiology of the liver remaining unknown.

3. The History of Learning the Liver in Traditional Chinese Medicine

While ancient western medicine saw the liver as the seat of passion, desire, life, soul, intelligence and love, and the source of anger, ancient China learned the liver differently.

The superficial anatomy of liver was recorded in ancient China (Zhang, 1981; Yang, 2010; Zhu, 1992; Hou, 1957). *Ling Shu* (《灵枢》 *Spiritual Pivot*) in Qin-Han dynasties, BCE 221 to AD 220, recorded that the liver was located in the hypochondriac region, below the diaphragm, and in front of the right kidney and the spine. Averagely, at the age of 50, the liver *qi* (气 vital energy) starts to decline, the lobes of the liver become thinner, the secretion of the bile also decreases, and the vision gets blurred.

Nan Jing (《难经》*Classic of Difficult Issues*), Han dynasty, 1st century AD, recorded that the liver weighed about 1.084 kg.

Nan Shi "*Gu Ji Zhi Zhuan*" (《南史・顾觊之传》 *History of the Southern Dynasties* "Biography of Gu Ji") recorded the first record of autopsy in ancient China. It was not until 800 years later in 1302 that Bartolomeo da Varignana, the famous anatomist in Europe, did the first autopsy on a man who was poisoned to death in Bologna.

From the above first record of autopsy in ancient China to *Yi Lin Gai Cuo* (《医林改错》*Correction on Errors in Medical Works*), the first anatomy monograph in Qing dynasty, records about anatomy of the human body increased and explored human organs. However, the anatomy was only limited practiced because of the Confucian emphasis on the holiness and completeness of a body. It turned out to be that the liver did serve as a material substrate performing several functions, whereas its structure per se attracted little attention. There was no further research of the inner structure of liver. The structure of liver just remains in superficial anatomy in TCM, with the terms of liver and its function in TCM being far beyond the organ of liver itself.

Different methodology of TCM and western medicine lead to different views of the human body, disease and physiology. The structure of liver just remains in superficial anatomy in TCM, however, the terms of liver and its function in TCM are far beyond the organ of liver itself.

According to *Huang Di Nei Jing* (《黄帝内经》*The Yellow Emperor's Inner Classic*) firstly compiled and commented by Wang Bing (王冰) during the Tang dynasty, 2nd to 1st century BCE, and the *Nan Jing*, the liver disperses the flow of qi: the liver flows qi through over the body free of all care, as a tree getting taller (木 wood), thereby regulating its circulation. It also stores *xue* (血 blood) and other vital fluids, thus controlling their flow. This storage role allows the liver in particular to maintain a special relationship with the eyes, its sense organ, nails and muscle. The liver is the general governing the body-mind integration, harmonizing digestion and emotions. Irregular liver qi, i.e., a stagnant liver qi flow, can cause cysts, tumors, breast lumps, digestion troubles and so on (Figure 1B).

The concepts from the *Huang Di Nei Jing* and the *Nan Jing* mark the subsequent stages of development of TCM towards a consistent application of a non-metaphysical body of natural laws to an understanding of body, health and illness (Unschuld, 1987). Over the centuries, TCM turned to the theory development of the liver rather than anatomic observation.

4. The Cultural Characteristics of Traditional Chinese Medicine

Different methodology of TCM and western medicine lead to different views of the human body, disease and physiology. The conventional western medicine developed from myths, empirical medicine, animal anatomy, autopsy, microscopy and then evolved into modern medicine. The rule of western medicine is that seeing is believing and thus its development is a process of exploration and accumulation of data and evidence.

TCM is far away from a clear-cut subject. Aristotle thought Asians (which he referred to was in fact today's Middle East) were souls endowed with art and thought because of the surplus of food allowing men the leisure to engage in intellectual and artistic endeavors (Yi, 2004). No arguably, the different

geography did help to form the unity and continuity of Chinese culture, by which TCM's persistent probe on philosophical understanding of human body can be explained. Such an amalgam of Chinese people's experience and knowledge system over thousands of years of struggle against illnesses and diseases is a hard nut to crack for western perspectives, and for lay men in local China (Xu, Chen, & Xu, 2018).

A comprehensive scope of cultural characteristics of TCM has been shaped by interrelating human body with humanity, nature, cosmos, philosophy, biology and other fields.

In ancient China, there was intellectual framework *dao* (道 metaphysics) that had been existing long time ago. Human was the microcosm of the universe. The body structure paralleled the physical design of the world and the body functions mirrored the workings of the natural and social orders. Human and the cosmos were animated by qi which consists of the inborn *yuan qi* (元气 the vital energy by birth) and the acquired qi that a person develops over the lifetime. As everything is viewed as interconnected and interdependent, analogism (取象比类) is the primary logic in understanding everything. A harmonious system is emphasized in all existence: a system in harmony tends towards health and sustainability, while the disharmony inevitably leads to illness and disease, suffering and collapse. Yin-Yang theory explains the opposite elements and forces that make up existence. The basic concepts of qi and yin-yang are the very roots of TCM. The body structure and operations are governed by yin-yang: When all of the yin and yang aspects of qi are in harmony with each other, health become reality.

Resting on these two basic principles of yin and yang, and qi, TCM developed different perspectives to understand what is happening in the body, notably applied is *Wu Xing* (五行 the five phases: wood, fire, earth, metal and water), which depicts the stages of change or transformation that qi goes through as it shifts between yin and yang (Weng & Chen, 1996; Louis, 2014; Craik, 2009).

Then the above intellectual framework was applied to TCM, with solid information found in *Huang Di Nei Jing* and *Nan Jing*. The five phases match phenomena in cyclic systems (astronomical, meteorological, biological, physiological) to each other and to the Yin and Yang. The five phases parallel *Wu Zang* (五脏 the five viscera): in human, wood is defined as liver, fire is defined as heart, earth is defined as spleen, metal is defined as lung, and water is defined as kidney. There are also *Liu Fu* (六腑 six bowels), *Jing Luo* (经络 meridians) and Chinese herb of botanical. Human life's essential energy, physiological functions, pathological changes, diagnosis and treatment are illustrated in this classical Chinese philosophical model.

The above theoretical frameworks shed light on the understanding and learning of liver in TCM. Consciousness should be raised towards two prerequisites of learning the liver in Chinese culture.

On one hand, the terms of liver and its function in TCM are far beyond the organ of liver itself. The TCM organs are not actually a materialized organ. The framework of TCM theory, based on the limited physical knowledge of the body and on the comprehensive philosophical outlook, developed a unique explanatory system of the liver, and different diagnosis, prescription, and medical treatment from the

western medicine. The five phases and the six bowels are body zones consisting the Upper, Middle and Lower Burners, i.e., where calories are burned according to western medicine (Kleinman, 1980; Bray, 1993). The liver in TCM is regarded as the general of organs: It stores blood, governs the ligaments of the body, flouring in the finger and toenails, and exits through the eyes.

On the other hand, the TCM treatment on the liver and other viscera has always been developing in its own pace despite the framework of TCM theory seen no need of big changes. Most of ancient anatomical activities were to verify the theory and were terminated as soon as they reached the goal, as it has been mentioned that the structure of liver remained superficial anatomy in TCM. In thousands of years, it was adaptable for the past illnesses but also is still regarded applicable to current diseases by TCM practitioners and supporters. Doubts on the theory, as yet, did arise, i.e., in *Yi Lin Gai Cuo*, but they were mostly handled by seeking equivalent explanations from the theory itself. Therefore, the interpretation of classics in TCM weights more than technological issues. Although all the subsequent technology and inventions in modern medicine can be useful and complementary to TCM's superficial exploration of human physical structure, they can only exercise indirect influence instead of directly application in TCM.

Thus, TCM is a system of complication and to some extent, chaos, which consists of knowledges of astronomy, meteorology, philosophy, physiology, biology, systems biology and integrative medicine. TCM lays more emphasis on theoretical development, it had been stopped at superficial anatomy instead of further physical probes. The basic framework of TCM theory is one kind of universal rule that would not be subsequently falsified, this is the reason why there was still the resilient and even the revived TCM in China after the oriental transmission of western sciences. Despite the modern medicine has rapidly taken a lion share of the world medicine, the coexistence of TCM and modern medicine in China and the increasing popularity of TCM as an alternative in other countries are demonstrating the fact: There are still a lot of knowledge to be unveiled in TCM.

5. Conclusion and Development of Traditional Chinese Medicine

The different styles in view of human body and research methods in ancient China and in the west result in today's sharp contrast between TCM and modern medicine. In a holistic point of view, TCM evolved into complex theory innovation, while western medicine shifted from myths to evident-based reductionism.

There would be four possible directions of development of TCM. The first one is that TCM could be replaced by modern medicine, the second possibility is that TCM could be coexistence with modern medicine for another long time, the third one could be modified TCM that would assimilate modern medicine, and the fourth probability could be new Chinese medicine that would be evolved from integration of modern medicine and TCM.

For the above possibilities, we may try to get hints from the following facts.

Craik, a Hippocratic scholar, concludes that there must have been interaction between Hippocratic

Corpus and TCM between 1000 and 500 BCE, and that there indeed are parallels between their channel systems, treatment methods, and philosophy (Sivin, 1987; Thabrew & Hughes, 1996).

The intrusion of western medicine into China accelerated after the Opium War in 1840s. Western medicine did play some impact on TCM, for example, in the case of jaundice, traditionally, this discolouration of the skin was ascribed to a moist hot disorder from the blocked splenic and stomach systems, particularly the Yang qi, usually from an improper diet. While when TCM doctors recognized that the liver played a role in bile secretion, jaundice then represented a major manifestation of the moist hot disorder of the hepatic and gall-bladder systems, they may make different treatment.

Meanwhile, the efficacy of acupuncture and herbal therapy has attracted attention in the west, glycyrrhizin which is from Glycyrrhiza root has been shown to be useful in the treatment of chronic hepatitis and in the prevention of hepatocellular carcinoma in chronic hepatitis (Arase, Ikeda, Murashima et al., 1997; Thomas & Peter, 2008).

Principally, by decoding its theoretical principles, TCM syndrome differentiation is developing and numerous medical cases are rapidly enriching corresponding database of TCM, though this individualized practice also inevitably makes it difficult to reproduce. Such profile building and database construction of TCM treatment is in line with the idea of precision in western science. Besides, many of the observations of TCM have been proved correct. TCM is ancient but not out-of-date (Qiu, 2015).

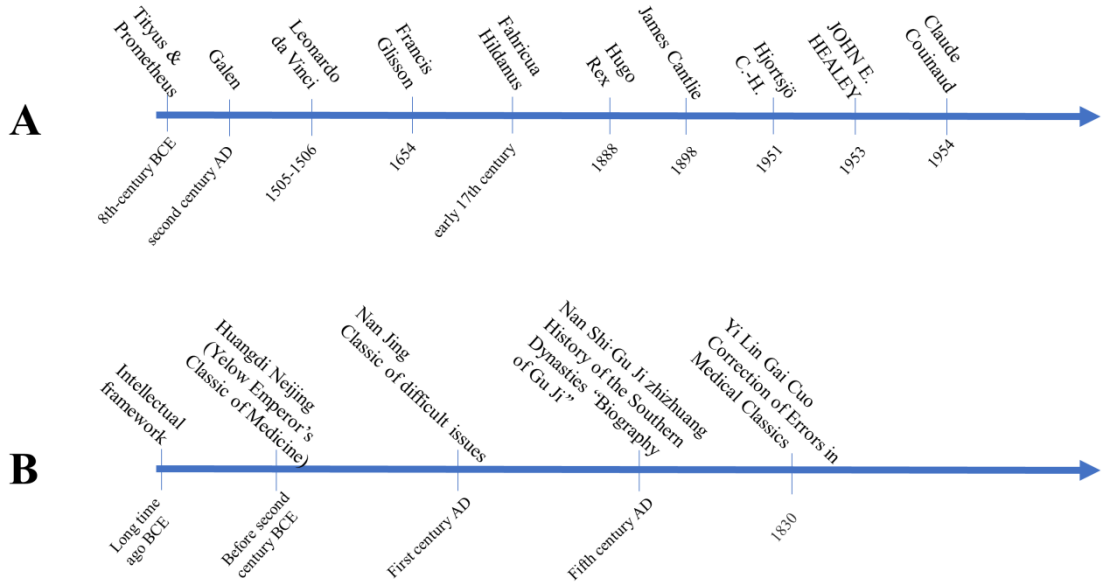
According to the cultural characteristics, TCM possibly could be coexistence with modern medicine in China for another long time at most.

Figures and Legends

Time axis of histories of learning the liver in traditional Chinese medicine (TCM) and western medicine.

Figure 1A, Time axis of history of learning the liver in western medicine focusing on anatomy, from myth to deconstruction of the liver.

Figure 1B, Time axis of history of learning the liver in TCM, from intellectual framework of basic theory of TCM to superficial anatomy of the liver.



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