

Lost in Translation: The Misattribution of Chinese Medicine Organs

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Abstract

This article discusses the misattribution of organs in traditional Chinese medicine (TCM) and the communication problems this creates when discussing Chinese medicine with patients or non-TCM healthcare professionals. This mainly involves confusion around such organs as the pancreas, spleen, adrenal glands, gonads and the kidneys.

Introduction

There are many obstacles that prevent patients or non-TCM healthcare practitioners from understanding traditional Chinese acupuncture. But one obstacle could be easily removed - the misattribution of Chinese medicine organs.

Pi: spleen or pancreas?

There is a lot of fact-based content in the *Nei Jing* (Inner Classic), such as the signs and symptoms that result when an organ is stressed. But there is also a lot of theoretical content. This usually relates to areas where practical observation was not an option, such as the theories about metabolism and organ function. Considering that these theories were made over two thousand years ago, when there was no knowledge of the chemistry or microscopic anatomy of the body, it is understandable that some aspects of the theory were incorrect. This resulted in there being only a loose relationship between the theoretical *Nei Jing* organ functions and the actual anatomical organs. This loose relationship led to the main digestive organ, pi, being mistakenly attributed to the spleen. However, when comparing this organ's main functions with those of the organs described in contemporary physiology, it is clear that the organ should have been attributed to the pancreas.

the hormones insulin and glucagon to control the uptake of glucose (the body's main fuel²), and also secretes the hormone pancreatic polypeptide, which is thought to induce our appetite.³ Hence the main functions of the contemporary pancreas also involve digestion, the production of energy and appetite. It seems obvious that both descriptions are referring to the same organ and that the Chinese medicine organ pi should therefore have been attributed to the pancreas.

The spleen (in contemporary physiology) is a part of the lymphatic system (it is often regarded as a large lymph node) and its main functions are therefore related to immunity;⁴ it also helps to maintain an appropriate amount of fluid in the tissues and purifies the body fluids, destroying debris such as dead cells.⁵ It is therefore difficult to see how the Chinese organ pi, the key digestive organ, was mistakenly equated to the spleen.

In the *Nan Jing* (Classic of Difficult Issues, circa 1st century AD), the 42nd difficult issue states, 'The spleen [pi] ... Its flat width is three inches. Its length is five inches.'⁶ The contemporary spleen is a rectangular structure with a thickness of about one inch, length of about 4.7 inches and width of about 2.7 inches.⁷ Clearly the description in the Classic of Difficult Issues refers to the contemporary spleen, rather than the pancreas.

Due to this original misattribution, the term 'spleen' is now used in Chinese medicine to refer to the pancreas.

How was this mistake made?

Such dimensions could only have been obtained by dissecting a body, which raises the question: how was each anatomical organ associated with the theoretical organ functions? Even though there was knowledge of basic organ anatomy, this could not have amounted to much more than an awareness of the organ masses in the torso. It would not have enabled the functions of those organs to be correctly identified, since this would have required knowledge of the chemistry

The Chinese organ pi plays a key role in digestion and the production of energy, and is also responsible for our appetite. In contemporary physiology, the pancreas produces juices and enzymes that digest carbohydrates, proteins and fats,¹ secretes

and microscopic anatomy of the organ tissue, which did not then exist. It might be supposed that the physical ‘plumbing’ between the organs may have provided a clue to each organ’s main function, but since it was believed that nutrients could pass between the organs as a vapour, the presence or absence of physical links between the organs was not a guide.

If the ‘plumbing’ between the organs was not a guiding factor, and it was not possible to work out an organ’s function from its tissue, how did they manage to attribute the other organs correctly? With the liver, kidneys, stomach, heart, lungs or intestines, the discomfort produced when the organ was stressed could have helped identify which anatomical organ produced the symptoms. But with the Chinese medicine organ pi, this factor was not available, so that the only guide was its theoretical function. It was thought to work closely with the stomach. The spleen is a relatively large organ mass adjacent to the top part of the stomach, and when viewed from the front during dissection is much more visible than the pancreas (which would be hidden from view, behind the stomach). This may explain why the spleen was selected rather than the pancreas. Understandably, due to their limited understanding of metabolism and organ physiology, the *Nei Jing* authors had no idea that the spleen, even though it was a large organ adjacent to the stomach, played no role in digestion.

Unfortunately, due to this original misattribution, the term ‘spleen’ is now used in Chinese medicine to refer to the pancreas. This causes comprehension problems in our discussions with patients, non-TCM healthcare practitioners and anyone who has even a rudimentary knowledge of physiology. When we tell a patient that their digestive symptoms are due to a problem with their spleen, or we tell anyone with medical knowledge that we address a patient’s digestive problems by treating their spleen, the best response we could hope for is a puzzled look, and the worst may be outright mockery. Whereas if we told them that their digestive symptoms were caused by a problem with their pancreas function and our treatment addressed the issue by directly treating their pancreas, then all would be far more likely to understand the Chinese medicine approach and look forward to the treatment outcome. Before Chinese medicine stands a chance of being understood (or even eventually embraced) by contemporary science, it is necessary to address such basic organ attribution issues.

Shen: kidneys plus adrenals and gonads?

It is also clear that the Chinese organ shen does not correctly equate simply to the kidneys. Instead it refers to the combination of three contemporary organs and glands: the kidneys, adrenal glands and gonads.

The wide range of functions that Chinese medicine attributes to the shen includes,

- A playing a key role in the constitution;
- B regulating and enabling the functioning of the other organs (usually expressed in Chinese medicine as: ‘being the foundation and source of our body’s yin and yang’, and the kidney yang ‘warming the organs and thus promoting their function’);
- C guiding the growth and sexual development of our body;
- D enabling the development of bones, bone marrow, the formation of blood; and
- E coordinating the circulation of body fluids.

In contemporary physiology, when looking at kidney functions, only item E and part of item D from the above list seem to fit. Amongst other functions, the contemporary kidneys,

- Regulate the amount of water that circulates in our blood plasma by either recycling water back into the plasma to increase the level, or excreting excess water in our urine (item E).
- Regulate the amount of red blood cells. When this falls too low, the kidneys release the hormone erythropoietin, which instructs the bone marrow to produce more red blood cells (part of item D).

The functions listed in the other items (A, B, C and parts of D), could not be performed by the contemporary kidneys. However, the adrenal glands have a significant functional overlap with these aspects. The adrenal cortex secretes various hormones which have a wide range of functions, largely concerned with regulating our bodily resources. One such hormone is cortisol, one of the key hormones in our body, which has the following functions:

- Regulates our body’s energy usage and mobilises its energy stores,⁸ and also regulates our blood glucose level by counteracting insulin.⁹
- Plays a significant role in enabling the conversion of glycogen to glucose in our liver, kidneys¹⁰ and muscle tissue, which releases stored glucose to use as energy; and also mobilises the energy stored in our body’s fat reserves for use elsewhere, such as in our active muscles.¹¹
- Is necessary for the development and maintenance of normal immunity.¹²

In the stressed state, the inner medulla (part of the adrenal glands) secretes various hormones, including epinephrine (also known as adrenaline), one of whose actions is to increase the secretion of cortisol, which then musters our bodily resources to deal with the stressful situation. This includes,

- Suppressing bodily functions that deal with our

long-term survival, such as our immune system (the production of B-cell antibodies is reduced) and bone formation. It also slows down the healing of wounds and shuts down the reproductive system, so that more of our energy resources can be focused on solving the urgent situation.¹³

- Actively increasing our immediate supply of energy. It does this by increasing the conversion of proteins into energy via the process of gluconeogenesis in the liver and kidneys.^{13, 14}
- Raising blood pressure levels by increasing the sensitivity of the blood vessels to adrenaline, causing them to contract.¹⁵

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When comparing these functions with the Chinese medicine kidney described in items A and B above, it is clear that the adrenal glands play a large part in performing these functions. As to item C, this is clearly the function provided by the gonads, which secrete hormones that control our body's development as we pass from childhood into puberty and on into adulthood and old age, as follows:

- Testosterone stimulates the male reproductive system to grow to full size and become functional; stimulates the formation of sperm; determines the male sexual behaviour;¹⁶ stimulates the development of characteristics such as the growth of a beard, deepening of the voice, enlargement of the genitalia, broadening of the shoulders, growth and strengthening of bones and muscles;¹⁷ and even changes the development of our brain to produce some of the recognised differences in the mental characteristics of males and females.^{18, 19}
- Oestrogen stimulates the female reproductive system to grow to full size and become functional; stimulates the production of ova; and stimulates characteristics such as enlargement of the breasts, broadening of the pelvis, depositing of fat in the thighs, and the onset of the menstrual cycle.²⁰

From an anatomical perspective, it seems reasonable to regard these three structures (the kidneys, adrenal glands and gonads) as being separate parts of (essentially) the same organ. The adrenal glands are attached to the kidneys (the adrenal glands are also known as the suprarenal glands, since they are located at the top of each kidney), and the gonads are located nearby (in a male embryo,

the testes are initially in the same location as the ovaries, and only later descend into the scrotum). Also, there is no separate channel for the adrenal glands or gonads, yet when the 'kidney' channel and acupoints are utilised, this affects the functions of all three of these structures; and when faults occur in the function of either the adrenal glands or gonads, this manifests on the 'kidney' channel, acupoints and pulse. For example, when a person suffers immunity-related issues (such as hay fever, allergies, and low immunity in general), they often have a weak 'kidney' pulse, and key 'kidney' acupoints would tend to be tender when pressed, even though (in contemporary physiology) the organ largely responsible for the condition would be the adrenal glands.

This makes it clear that when a Chinese medicine practitioner diagnoses a problem with the 'kidneys', this could refer to problems with any combination of the kidneys, adrenal glands or gonads; and when 'kidney' acupoints are used to treat the condition, this can treat the function of whichever of these three structures were affected, including the associated hormonal activity. This situation produces similar communication problems as the pancreas/spleen attribution issue above. For example, if as Chinese medicine practitioners we tell a non-TCM healthcare practitioner or informed patient that the underlying cause of hay fever is a problem with kidney function, and that acupuncture successfully treats this by treating the kidneys, they would find it hard to regard us as anything other than misinformed cranks who knew nothing about medicine—since the contemporary kidneys have no such function. However, if instead we were to explain that the issue was a problem with their adrenal gland function, and that we address this by directly treating their adrenal gland (which in Chinese medicine is treated alongside the kidneys), this would make perfect sense to them. Their response would be more likely to be fascination at the insight Chinese medicine offers into their condition, and to look forward to the treatment outcome.

Likewise, if we said a patient's infertility was caused by a problem in their kidney function and that Chinese medicine addressed the issue by treating their kidneys, an informed patient or non-TCM healthcare practitioner would find this incomprehensible. Whereas if we said the problem lay in the function of their gonads and Chinese medicine addressed the issue by directly treating their gonads (which in Chinese medicine are always treated alongside the kidneys), they would immediately understand.

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Endnotes

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