



The Role of Body Organs in Cardiac Health from the Viewpoint of Avicenna

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Abstract

Some symptoms of heart illness can be due to diseases originating from other organs. In Persian medicine (PM), this state is called *participatory heart diseases*. Current medical findings have found an important association between symptoms of psychiatric disorders and chest pain. Some of the other organs such as the lungs, liver, stomach, intestines and uterus have a proven effect on the heart. This relationship between the heart and other body organs has been considered by different ancient medical doctrines during a long historical period. In this article *participatory heart diseases* are explained from the viewpoint of Avicenna.

Keywords: Avicenna, Heart, History of medicine

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Introduction

The high incidence of mortality attributed to cardiovascular diseases [1] indicates the sensitivity of the heart function in keeping one healthy. Discovering the causes of these disorders has an important role in both diagnosis and treatment. Some symptoms of illness in the heart can be due to diseases originating from other organs. In traditional Persian medicine (PM), this state is called *participatory heart diseases*. Therefore, the health of other organs can have an impact on cardiac health. Current medical findings have found an important association between panic and hyperventilation [2] or symptoms of psychiatric factitious disorders in patients and chest pain [3]. Therefore, the function of the brain is contributory to the health of the heart [4]. In addition, some of the other organs such as the lungs [5], liver [6], stomach [7], intestines [8] and uterus [9] have a proven effect on the heart. This relationship between the heart and other body organs has been considered by different ancient medical doctrines during a long historical period.

According to Ayurveda, an ancient Indian traditional school (about 5000 years ago), the theory of balance applies to the whole lifestyle, especially the body in keeping its appropriate function. This theory is based on controlling the functions of three Doshas or biological qualities (vata, pitta and kapha) on the five essential elements (ether, air, water, fire and earth) to keep the whole body healthy by affecting the mind, the soul, and the organs. Thus, according to Ayurveda, the regulation of body function depends on appropriate interaction between the

organs through the balance of three Doshas [10]. In Chinese medicine (from 2500 years ago), the heart as an organ involved in the production of Qi can interact with other organs via meridians. In addition, based on Ko and Sheng theory of Chinese medicine, each yin or yang organ relates with its child and mother organ. According to this theory, the heart (attributed to fire) as a yin organ, is in direct connection with its child organ, the spleen (attributed to earth), and with its mother organ, the liver (attributed to wood). There is also a contribution between these yin organs and their relative yang organs. According to the five-element body organs cycle (Ke-Sheng cycle), there is an indirect relationship between organs, based on the continuing impact of each organ on the subsequent organ where harmful relationships can result in failure in organs. For example, the heart can harm the lungs (attributed to metal) through its fire element, and the kidney (attributed to water) can result in heart failure. Consequently, all body organs and tissues work as a network to ensure the harmony of the body [11].

According to the theory of “Pneumata”, an ancient Greek medical theory initially noticed by Aristotle (322-384 B.D.), Galen (129-217 A.D.) believed in the mutual contribution between body organs. According to this theory, “Pneuma” (wind) enters the body from the respiratory system, circulates in the body organs such as the liver, heart and brain, and makes them create the natural spirit, the vital spirit, and the psychic spirit. Then, these spirits circulate in the body through the nervous system, veins and arteries [12].

Furthermore, the theory of interconnectivity of

body organs has an old historical background in PM which dates back to 6000-7000 years ago. In the text of “Gozidehaye Zadespasm”, which was extracted from a Zoroastrian manuscript and compiled during the Sassanid era (224-637 AD), the power of the head and the body organs is transferred to other organs via arteries, and the source of this power is the digested food in the stomach [13]. Although this interpretation does not clarify the details of the relationship between body organs, it still suggests the attention to be paid to the interactions between organs from the ancient times in Persia. This issue was later, mentioned by great scientists and philosophers such as Avicenna (Ibn Sina, 980-1032 AD), in

the Islamic golden age (7th-12th century A.D.). Avicenna, the most famous medieval period Persian physician, was renowned in the west by his famous book, “The Canon of Medicine” (Al Qanon fi al-Teb).

He has valuable viewpoints on the heart in the Canon of the Medicine [14] (Figure 1), and additionally, he has two manuscripts on cardiology including a book about pulse named “Resale Ragshenasi” and a book on cardiovascular drugs named “al Adwiat ul Qalbiye”.



Figure 1. Very old manuscript of Qanon fi al-tib (The Canon of medicine), kept in the National Museum in Damascus, Syria.

He considered that humor (created by food) moves from the liver to all organs to replace what they have lost. Abnormal humor could not be used by body cells, and its accumulation leads to toxicity in the organs. As the main source of spirit and vital heat (Haar-e Gharizi) in the human body, the heart is one of the vital organs and its health is highly important. The Haar, is distributed throughout the body by the heart, and ventilated by the heartbeat and breath [15]. Avicenna believed that symptoms of heart illness can be due to malfunctions in other organs [14].

Participatory heart diseases present signs and symptoms in the heart with the etiology originating from other organs. Main organs involved in such an issue are the brain, stomach, colon, esophagus, liver, lung and uterus. The heart becomes involved due to many reasons such as the attenuation of normal food or respiration, reception of abnormal humors from a sick organ, vicinity of a malfunctioning organ to the heart, and involvement of the heart in the pain of painful organs [15].

Interrelations between the heart and other organs in Avicenna's view

In the third volume of the Canon of Medicine, Avicenna elaborates on the involvement of body organs in heart failures. Bellow, Avicenna's points of view concerning the role of body organs in cardiac health is explained.

Brain

The weakness of the brain is said to be transferred to the heart through nerves connected to the two

organs. Reduction of respiratory capacity and lack of fresh air would lead to dystemperament of the heart (*Sū'-e mizaj*), the abnormal functioning of the organ, arrhythmia, syncope and faint. In addition, abnormal humor can move from the brain to the heart causing different signs and symptoms in the heart [14]. This can be compared with psychosomatic disorders. Stress, depression, physical activity, sleep or wakefulness can result in heart symptoms. A clear example is the panic attack, which is accompanied by cardiac pain in 30 percent of cases [16]. Hyperventilation in a panic attack is accompanied by non-angina chest pain and nonspecific changes in the ECG [17]. It is also possible that psychological disorders intensify the underlying cardiac diseases. For instance, a patient who is suffering from coronary heart disease might be stricken with an ischemic heart attack during a panic attack (2). Other psychological causes for cardiac pain comprise of depression, somatization, and factitious disorder [18].

Liver

According to the PM literature, the liver is the main source of blood and food for body organs (which seems to be equal to cholesterol, glucose, calcium, sodium and potassium). The weakness of the liver leads to reduced blood production and ultimately the weakness of the heart. Change in the liver temperature can cause symptoms such as sadness, weakness, lack of vitality, and cardiac arrhythmia [14].

The impact of the liver on the heart has been known to some extent. Hyperlipidemia, in

which the liver has an effective role, is the most important risk factor for cardiac diseases. In fatty liver or cirrhosis, increased heart rate and cardiac output, decreased arterial pressure, and increased plasma volume are prevalent. Cirrhotic cardiomyopathy is a cardiac condition observed in patients with cirrhosis regardless of the etiologies. It is characterized by the impaired systolic response to physical stress, diastolic dysfunction, and electrophysiological abnormalities [19].

Stomach and intestines

Sticky humor in the stomach cardia can cause cardiac arrhythmia and syncope because of vicinity to the heart. The rise of vapor generated in the stomach and the intestine toward the heart can weaken it [14]. There have been many studies about the connection of gastrointestinal diseases and the heart. Pain in the esophagus may be accompanied by cardiac pain or it may mimic it (linked angina). Bradycardia after ingestion and syncope induced by ingestion are some well-known examples [20]. Gastro-esophageal reflux disorder (GERD) is frequently observed in patients suffering from coronary ischemic diseases and is introduced as a stimulating factor for cardiac ischemia [21]. The inflammatory bowel disease with pericarditis and cardiac arrhythmia are some more examples [8].

Lung

PM scholars believes that abnormal humor can move from the lungs to the heart creating cardiac symptoms. The heat from the lungs can affect the heart. In PM, lungs act as cooling

organs and the heart temperature is regulated by the lungs via the oxygen flow from the lungs towards the heart. Whatever makes respiration slower can increase the lung temperature leading subsequently to warm dystemperament of the heart [14]. In acute cases, tachycardia happens to move the extra heat from the heart to other organs. In chronic cases, the heart rate is decreased to reduce the activity and heat generation process. In conventional medicine, Cor-pulmonale (i.e., the failure of the right ventricle following pulmonary hypertension induced by lung, upper airways or chest diseases) may be considered as an example for the PM explanations of associations between the lung and heart [5].

Uterus

PM literature notes that there are vapors moving from the uterus toward the heart that can cause arrhythmia and syncope [14]. These vapors could be considered as electromagnetic noise produced by uterine contractions, chemicals is a cardiac condition observed in patients with cirrhotic regardless of the etiologies. It is characterized by the impaired systolic response to physical stress, diastolic dysfunction, and electrophysiological abnormalities hormones or even inflammatory and metastatic cells with uterine origin. The involvement of different layers of the heart is reported in uterine metastatic malignancies [22]. Involvement of the heart is even possible in benign uterine diseases. Heart damage has been observed in 50% of patients suffering from uterine myoma [23]. It is believed that some degenerative

changes occur in heart members of patients suffering from uterine fibroids [9].

Conclusion

According to the historical contents presented above, while the interrelationship between organs and the heart has been proposed since ancient times, this interconnectivity has been only generally discussed in the majority of ancient medical doctrines. Nonetheless, according to the Canon of Medicine by Avicenna, a bilateral relationship is described for the heart and any associated organ in the body. Given the importance of this interconnectivity, the issue was applied in the diagnosis and treatment of diseases in PM. This view can open a new horizon for prevention and treatment of heart diseases. Therefore, it is suggested to conduct observational studies to assess the involvement of body organs in cardiac patients or those referring with cardiac symptoms. It is also required to have a holistic view while evaluating cardiovascular patients and to check up and examine other organs, particularly those mentioned within this context.

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Conflict of interest

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