

The Pulse in Traditional Iranian Medicine

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1. Background

In Iranian medieval medicine (IMM), pulse was considered a valuable means to inform the physician of the internal disease, according to the two of the most astound Iranian medical encyclopedias: "The Canon in Medicine" (1, 2) and "Zakhireye Khwarazmshahi" (3).

Ibn Sina (Avicenna) (980-1037 A.D.), an imminent Iranian scholar in 10th-11th centuries, is praised as the most famous of the Islamic scientists in the history (4). He has authored numerous books, the most important of which are "The Book of Healing" and "The Canon in Medicine" (the first textbook of medicine on earth (5) and the oldest known "medical bible" (6)).

Seyyed Esmaeel Jorjani [Esma'il Gorgani] (1040- 1136 A.D.) was an Iranian physician, theologian and scientist who authored the valuable "Zakhireye Khwarazmshahi" (7). In Gorgani's time, Iranian medical language shifted from Arabic to Persian, and his revered book served as a comprehensive medical encyclopedia and a Persian medical dictionary. In his book, Gorgani simplified and standardized the work of Rhazes, Al-Havi and Avicenna (7).

2. Doctrine on the Definition of Pulse

Pulse [NABZ], the movement of arteries, is comprised of 4 components: two motions (one distention and one contraction), each followed by one pause. This definition matches the current trisection theory where upstroke equates the distention, systolic peak equates the first pause and diastolic slope equates the contraction.

Gorgani stated that pulse rate in all normal limbs equates the heart rate. Only in feverish limb (indicted by inflammation or suppuration) the feeding arterial pulse becomes stronger and more rapid than the heart rate or pulse rate of other non-affected limbs; suggesting the ability of arteries to create automatic pulsation. Gorgani believed that the contraction motion is not passive, rather it is an active movement caused by arterial autonomy.

Avicenna, being a polymath, compared the patterns of the pulse with musical rhythm, tone and pitch. He quoted Galen's theory that "pulse patterns are similar to the five known musical harmonic rhythms: $\frac{2}{6}$, $\frac{2}{4}$, $\frac{2}{3}$, $\frac{3}{4}$ or $\frac{4}{5}$ " and divided the pulses into eurhythmic and arrhythmic. In modern medicine, pulse is considered a composite wave with harmonic components similar to musical waves (8).

Forearm (radial pulse) was introduced by both scholars as the preferred location to palpate the pulse. Gorgani acknowledged differences in pulse patterns based on race, gender, age, geographical altitude, etc. and recommended that individual reference ranges are selected based on the above variables.

3. Doctrine on the Function of the Pulse

In IMM, pulse was considered the means to distribute fresh air (breath) in the body at distention and filter out the slag from the spirit at contraction. The left-lodged heart ([GHALB], center of animal spirit) would distribute the air and spirit in the body, and the right-lodged liver ([KABED], center of natural spirit) would transform food to blood. Liver, heart and brain ([MAGHZ], center for mental spirit) were considered the chief organs and body is structured to provide balance among them (9).

4. Interpretation of the Pulse Patterns

Although the definitions and characteristics of pulse in IMM are close to that of modern medicine, same is not true about the interpretation. Many complex pulse patterns were defined in IMM (Table 1).

For example, Avicenna described plethora [EMTELA'] as a disease of humoral imbalance, which may be qualitative (ineffective humor causing defective function) or quantitative (causing engorgement, distension and obstruction of body cavities). Abnormal pulse, one of the best known

Table 1. Complex Pulse Patterns in Iranian Traditional Medicine

Pronunciation of Name	Definition of Name	Modern Equivalent	Description
ZANB AL-FAR	Mouse tail pulse cluster		Following a strong/high amplitude pulse, decrescendo pulses (decreasing strength/pace/amplitude) ensue
ZANB RAJA	Returning pulse cluster		Mouse tail pulse returning to normal in a crescendo and mirror-like format
ZANB MONGHAZI	Elapsed pulse cluster		Mouse tail pulse followed immediately by a similar mouse tail pulse
ZANB MOSALLI	Diverting pulse cluster	Flickering pulse	Initial defective pulse (in strength/pace/amplitude) followed by less defective pulses until a climax is reached, then increasing defect to the initial level
ZANB MINSHARI	Saw-tooth pulse cluster	Serrated pulse	Strong, rapid and rigid waves, each followed by a sudden slump of vital power following manifestation of ailment
ZU AL- QUARA'TEIN	Two in one pulse	Dicrotic pulse	A small peak is followed by a large peak without any intervening pause
GHAZALI	Deer-leap like pulse	Pulsus bisferiens	Starts with a slow distention, followed by a pause, and then a second rapid distention until it reaches a peak, and then returns to normal
MOWJI	Wave like/bounding pulse	Bounding pulse	Wide mounts and troughs with a regular rhythm
DUDI	Worm-like peristalsis pulse	Pulsus parvus et tardus	Pulses small in size, rapid in pace and regular in rhythm
NAMLI	Formicant pulse	Pulsus parvus	Weakest of all pulses similar to hypovolemic shock
MOTASHANNEJ	Spasmodic pulse		Irregular pulses similar to ventricular tachycardia waves

signs of plethora, was described by Avicenna as full and strong pulse and weak and irregular pulse respectively.

Narrowing the approach down to one organ is a desired flaw of modern medicine. Human body should be considered a psychosomatic constellation, comprised of several organs and spirit. There are diseases (i.e. myocardial infarction) for which highly specific treatments (i.e. angioplasty) are in practice while modification of other systems (i.e. anti-inflammatory agents like Statins) have proven to provide comparable effects.

5. Conclusion

Knowledge about the history of medicine can help clinicians better appreciate the science and reclaim their unique role beyond all the help from costly paraclinics and imaging modalities in patient care. Physicians, as the keepers of the medicine, have to revive the roots and wisdom and pass them along to the future generations.

Footnote

Conflict of Interest: The authors have no conflict of interest to declare.

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