



## Review

# Ancient Persian medical views on the heart and blood in the Sassanid era (224–637 AD)



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## ABSTRACT

The Sassanid Empire in Persia (224–637 AD) ruled one of the most influential eras in world history. They with the Romans and later the Byzantines were two global powers in ancient times. Medicine was well organized in the official Sassanid system. Hospitals, medical centers, and universities were developed throughout Persia during their reign. This study brings to light for the first time the era's medical views on the heart and blood, based on extant Sassanid Pahlavi manuscripts and documents. Although these documents are non-medical texts (because Sassanid medical texts were destroyed in attacks on Iran by neighboring powers, such as Alexander the Macedonian and leaders of the Arab Empire throughout history), some novel theories on the history of cardiology can be found among them. Physicians of that time made a preliminary description of pulmonary circulation. They knew about the role of blood circulation in feeding bodily organs. They believed that blood is a factor for spreading infection because of its invisible monsters (*divan*). Their beliefs can be considered as the first theories on infection due to an external living factor, today known as the microbe. Other Sassanid beliefs and findings about the heart and blood in medicine are described in this review.

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## 1. Introduction

The history of medicine in Persia (Iran) dates back thousands of years [1]. This area, from the beginning of history until 637 AD when Muslim Arabs conquered Persia and the Sassanid dynasty was overthrown, was known as Ancient Persia [2]. Zoroastrianism was the official religion of Persians for at least the last 1000 years of that period [3]. Three main Persian empires in ancient times were the Achaemenid (550–330 BC), Parthian (247 BC–224 AD), and Sassanid (224–637 AD) dynasties [1]. Although their well-organized civilization and global empires are well-known, unfortunately the existing information about their medical sciences is minimal, because most of their scientific documents were destroyed in invasions by neighboring rulers, such as Alexander of Macedonia and leaders of the Arab Empire. This lack of knowledge is also due to the weakness of current investigations [4]. Some recent studies, mostly of archeological findings and mythic, religious, and literary documents, show us some of the advanced aspects of the medical sciences in ancient Persia in such areas as pharmacy [5,6], surgery [7], psychiatry [8], gynecology [9,10], patients' rights [11], etc.

Although the influence of Persian scientists of the Islamic era, such as Avicenna [12–16], Rhazes [17,18], Haly Abbas [19], and Akhawayni

[20–22], on the progress of cardiology is indisputable, no comprehensive investigation into cardiology in ancient Persia has been done until now. The current study brings to light the views of ancient Persians of the Sassanid period on the medical aspects of the heart and blood. The Sassanid period (Fig. 1) was one of the most important eras in global history; it had a great political and scientific influence on history.

## 2. Sassanid era

Ardeshir I, son of Papak (180–242 AD), was the first king of the Sassanid dynasty who defeated Ardevan V, the last king of the Parthian empire, and established his kingdom and dynasty in 224 AD (Fig. 2) [23]. He and other kings of the Sassanid dynasty established their empire based on politics, military strength, and science [24]. They defeated the Romans and Byzantines several times in the Middle East. The world was bipolar for several centuries; Romans comprised the Western Empire and Persians (Parthians and later Sassanids) constituted the Eastern Kingdom. These two empires were at war for centuries, and throughout their history, neither could ever completely defeat the other [25]. Some of the most famous and powerful Sassanid kings were Ardeshir I, Shapur I (215–270 AD) (Fig. 3), Shapur II (309–379 AD), Khosrau Anushirvan or Kasra (501–579 AD) (Fig. 4), and Khosrau Parviz (The Victorious) (570–628 AD) [26]. During the Sassanid era, the Persians enjoyed an advanced and well-organized official structure and government system. Later, in medieval times, the Arab Empire adopted Persia's official organization [24]. Finally, Muslim Arab invaders

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Fig. 1. Sassanid (224–637 AD) and Byzantine territories in 527 AD.

defeated Yazdegerd III, the last Sassanid king, in 637 AD and ended the ancient Persian era [26].

Although the Sassanids had a religious regimen based on Zoroastrianism, they had free views on science. Religious views and racism were forbidden in scientific centers and universities like Jondishapour [4]. Jondishapour University and Hospital was the most important scientific center in its time of the world. Scientists of any religion or nationality were free to learn and teach various fields of science there [27–29]. In



Fig. 3. The huge statue of Shapur I in 7 m high, Sahpur Cave, Kazeroon, Iran.



Fig. 2. Ardeshir I, on a coin (accessible at <http://www.ngcoins.com/Coin.aspx?CoinID=121630#>).

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