

# Medical Care of Children during the Golden Age of Islamic Medicine

Houchang D. Modanlou MD<sup>1</sup>

## Abstract

During the Sassanid Empire in Persia (226–652 AD), there was a renaissance of humanistic sciences, including medicine, in the city of Gondi-Shapur. When the Islamic center of power moved to Baghdad in about 750 AD, physicians of Gondi-Shapur, including the dean of the medical school (a Nestorian Christian), gradually moved to Baghdad constructing hospitals and medical schools. Aided by the Persian and Nestorian Christians, the Islamic civilization ushered in what is considered to be the Golden Age of Islam from the 8<sup>th</sup> to 13<sup>th</sup> century AD. During this period, there were remarkable achievements in humanistic sciences including medicine by many physicians/authors whose medical textbooks were used for centuries in burgeoning medical schools in Europe. The medical texts written during the Golden Age of Islamic Medicine contain sections and chapters about the clinical conditions, diseases and medical care of children. It was during this era that the first treatise was written on the diseases of children and their care. This essay will describe, in brief, the writings about the conditions and diseases of children and their medical care, by three prominent Persian physicians of the Golden Age of Islamic Medicine: 1) Abubakr Muhammad Ibn Zakaria Razi, Rhazes (865-925 AD); 2) Ali ibn-al-Abbas al-Majusi or Haly Abbas (949–994 AD); and 3) Abu Ali al-Husayn ibn Abd Allah ibn Sina or Avicenna (980–1037 AD).

**This manuscript was presented, as a poster, at the annual meeting of the American Academy of Pediatrics, Historical Section, October 2014, San Diego, California**

**Keywords:** Avicenna, Haly Abbas, Islamic Medicine, Rhazes

**Cite this article as:** Modanlou HD. Medical Care of Children during the Golden Age of Islamic Medicine. *Arch Iran Med.* 2015; **18**(4): 263 – 265.

## Introduction

In Iran (previously known in the West as Persia), the art and science of medicine and medical care have roots in the pre-Islamic era. It has been noted that the history of medicine in Persia is as old and rich as its civilization.<sup>1</sup> According to Elgood,<sup>2</sup> Persians established the fundamentals of anatomy, physiology and pathology long before the Greeks. In 2007, Shoja and Tubbs<sup>3</sup> reviewed the history of anatomy and medicine in Persia from the period before the establishment of the Persian Empire to the modern era and emphasized the significant contributions made by the physicians of Persian origin to the art and science of medicine. Pre-Islamic science of medicine in Persia reached its zenith with the establishment of the academy of Gondi-Shapur or Jundi-Shapur.<sup>4,5</sup> During Sassanid dynasty (226–652 AD), Nestorian Christians, from Edessa and Nisibis in Northern part of Mesopotamia and Syria, migrated to the Persian Empire. Here they played a pivotal role in enhancing the importance of the academy of Gondi-Shapur, particularly during the reign of Sassanid King Khosrow Anoushirvan (531–578 AD).<sup>6</sup> They established hospitals and for generations directed the medical school in Gondi-Shapur until the transfer of the Islamic center of government in the 8<sup>th</sup> century AD during the Abbasid dynasty, from Damascus to Baghdad. Nestorians were well versed in Greek language and medicine. They translated ancient Greek medical texts first to Aramaic, possibly to

Pahlavi (Persian language during the Sassanid dynasty) and later to Arabic. They further contributed to medical science as the authors of several medical texts. Medical texts attributed to Hippocrates, Dioscorides, Celsus, Rufus and Soranus of Ephesus, Galen and other Greco-Roman authors were all translated into Arabic.

The most relevant text dealing with pregnancy and the care of the newborn infants was written by Soranus of Ephesus (98–138 AD). With the current definition of medical specialties, Soranus of Ephesus may be designated as the first Perinatologist.<sup>7</sup> Soranus wrote about breastfeeding, testing of the milk, weaning, problems of nursing, excessive crying, constipation, teething, assessment of growth and development, tonsillitis, thrush, skin lesions, diarrhea, wheezing, coughing and clinical signs of rickets in Roman children.<sup>7</sup> Similar to many scholars in the West, Raju<sup>8</sup> writes that “until the Renaissance very little was changed from what Soranus wrote”. As Andrew C Miller<sup>4</sup> states, this and similar statements completely ignore the contributions made by physicians during the Golden Age of Islamic Medicine including the medical care of children.

## Golden age of Islamic medicine

The period from 8<sup>th</sup> to 13<sup>th</sup> centuries AD was a remarkable period of scientific inquiry and achievements in the field of mathematics, philosophy, astronomy and medicine in the Islamic world.<sup>8</sup> For several centuries, medical texts written during this period by the pillars of medicine in that era were the principal medical teaching texts in subsequent burgeoning of the medical schools in Europe. In this essay, I will focus on only three prominent physicians/philosophers part of whose writings encompasses diseases and the medical care of children.

**Authors' affiliation:** <sup>1</sup>Department of Pediatrics, Division of Neonatology, Loma Linda University, California, USA.

**Corresponding author and reprints:** Houchang D. Modanlou MD, Department of Pediatrics, Division of Neonatology, Loma Linda University Medical Center, 11175 Campus Street, Coleman Pavilion, Loma Linda, California 92350, USA. Tel: +909-558-7448, E-mail: hmodanlou@llu.edu  
Accepted for publication: 25 February 2015

## Abubakr Muhammad Ibn Zakaria Razi or Rhazes (865–925 AD)

A musician in youth and an alchemist, Razi discovered and purified alcohol and other chemical substances, and became a physician later in life. Born in the city of Ray, near Tehran, he built a hospital, practiced and taught medicine in Baghdad.<sup>9,10,11</sup> Two of his most important texts in medicine were *The Comprehensive Book on Medicine (Kitab al-Hawi fi al-tibb* or *The Liber Continens*) and a book of medicine dedicated to Mansur (Liber ad Almansorem). However, his finest achievement was a monograph on smallpox and measles that was republished continuously in Latin throughout the centuries. It was translated into English in the 18<sup>th</sup> century and several times thereafter.<sup>12</sup> In this treatise on smallpox and measles (*Kitab fi al-Jadari wa-al-Hasbah*), Razi distinguished smallpox from measles and noted the complications of these illnesses.<sup>13</sup>

The first treatise on pediatrics is the *Practica Puerorum* written by Razi about the year 900 AD.<sup>12</sup> Radbill notes, “Having given acknowledgement that previous author such as Soranus, Oribasius (325–403 AD), Aetius (502–575 AD), and Paulus (625–690 AD), as well as, writers in India, Charaka, and Susruta, wrote extensive section on pediatrics in their texts, it was Rhazes who first siphoned off pediatrics into a monograph of its own”. The author relates, “The first printed pediatric book was that of Bagellardus, *De Egritudinibus Infantium* in 1472. This was largely based on the *Practica Puerorum* of Rhazes”. The author also states that the *Liber Continens* begins with a chapter on infant care and the next chapter deals with children. There is also a chapter on putting the child to sleep. Rhazes differentiated osteomyelitis (spina ventosa) from other swellings of the bones in children and was the first to describe spina bifida. In the same book, he also discussed infantile convulsions and difficult dentition. In the obstetrical section of the *Continens*, Rhazes listed as signs of viability in newborns passing urine, sneezing, or crying. In the *Liber ad Almansorem*, there is a chapter on prenatal care and one on management of the newborn. One summarizing care of children during childhood and adolescence follows a chapter on the choice of a wet nurse. Rhazes recognized internal hydrocephalus and differentiated congenital versus acquired microcephaly. He also differentiated hereditary or congenital convulsions from the acquired or post-traumatic seizures. Rhazes placed great emphasis on bathing the child and warned against use of ointments, which could only trap dirt and excrements. He wrote about infantile paralysis as well as birth injuries.

The booklet on the ailments of children and their care (*Practica Puerorum*) contains chapters dealing with varieties of diseases in children and their medical care. These chapters are: Dermal lesions of children; Scabies; Enlargement of the head; Abdominal distension; Sneezing; Sleeplessness; Epilepsy; Certain affliction which is called *Mater Puerorum*; Saneous matter from the ears; Venum running from the ear; Diseases of the eyes; Obliquity of vision; Diseases of the teeth; Constipation; Cough; Pruritus and vesicles; Worms; Distension or Prominence of the umbilicus; Hernia; Stone in the bladder; and Paralysis of children.

## Ali ibn-al-Abbas al-Majusi (Haly Abbas in Latin, 949–994 AD)

He was born into a Zoroastrian family from the Iranian city of Ahwaz about the time of Razi's death. Al-Majusi practiced medi-

cine in Baghdad and served as physician to the ruler, Adud al-Dawlah, founder of the Adudi hospital in Baghdad. It was to him that al-Majusi dedicated his only treatise, the complete Book of the Medical Art (*Kitab Kamil al-sina ah al-tibbiyah*), also called *The Royal Book (al-Kitab al-Maliki)*. In Europe, the treatise was known as *Liber Regius* or *Pantegni* and the author as Haly Abbas.<sup>3,14,15</sup> He described the concept of a capillary system and uterine contractions during birth as well as his description of surgical procedures.<sup>14,15</sup>

The 20<sup>th</sup> chapter of Book Two, of the two volumes, is about the care and management of infants and children. Two of my collaborators, Eugene L. Mahmoud, M.D. and Hikmat Sous, R.N.,<sup>16</sup> undertook a translation of this chapter from the original Arabic text.<sup>17</sup> Regarding the care of the newborn infant, it says: “Once the baby is born, he should be sprinkled on the skin with salt and crushed roses to strengthen the skin against the air. The baby's ear is sucked of moisture. He is fed with smoothly crushed sugar with sesame seed oil for two days. Every two or three days the baby is washed with fresh lukewarm water with myrtle and roses. The baby should be put to bed with embrace, gentle movement, and good melodies and away from the bright light. The baby cries because of the outside elements like heat and cold or the inside elements like hunger and thirst or retentions of urine and feces. As Hippocrates says, children can be exposed to thrush, vomiting, sleeplessness, fears, inflammation of navel, and the moisture of the ears. Convulsion may occur with illness. Examination of the body should be tailored based on the presenting symptoms”.

## Abu Ali al-Husayn ibn Abd Allah ibn Sina or Avicenna (980–1037 AD)

He was born in 980 AD in Afshana near Bukhara (then part of Persia, now in Uzbekistan) and traveled widely in the eastern Islamic lands, and composed nearly 270 different treatises. When he died in 1037 AD, he was known as one of the greatest philosophers in Islam, and in medicine. He was so highly regarded that he was compared to Galen.<sup>14</sup> Ibn Sina's magnum opus by which he was known East and West is the *Kitab al-Qanun fi al-tibb* or *Canon of Medicine*. Previously, I have written about Avicenna, the historical background, and his characterization in the literature and what he wrote about the care of the newborn infant.<sup>18</sup> Some information related to the care of the newborn infant were derived in part from the English translation of the volume I of the *Canon of Medicine* adapted by Laleh Bakhtiar<sup>19</sup> and the manuscript written by Peter M. Dunn.<sup>20</sup>

What follows are abstracted from 1930 translation of *Canon of Medicine* by O. Cameron Gruner and Mazar H. Shah.<sup>21</sup> The chapter dealing with the medical care from birth, infancy and to adolescence appears under Thesis I on nutrition starting on page 363 of the *Canon of Medicine*. Salient information from this chapter is as follows:

1. Care of the newborn from the time of birth regarding the care of the eyes, umbilicus, and bathing, dressing and sleeping quarters.
2. Importance of breastfeeding and its duration.
3. Appropriate nutrition and good physical and mental health of the breastfeeding mother and the wet nurse.
4. Importance of gentle rocking and singing lullabies during breastfeeding. He states, “Mother's milk is for growth of the baby's body and the music is for growth of the mind”.

5. Hygiene and disorders of dentition, inflammation of gums, fever and convulsion during dentition, aphthous stomatitis (thrush), constipation and diarrhea and their remedies are discussed.

6. Disorders of sleep, night terrors, snoring, colic and their remedies.

7. Disorders of eyes, ears, skin eruptions (frunculosis, intertrigo), hernias, round worms and flatworms and remedies for their cure.

8. Disturbances of the breathing, (sneezing, cough and coryza, hiccough, retropharyngeal abscess), disturbances of digestive system are discussed.

9. Discussion on neurological disturbances such as hydrocephalus and inflammation of the brain is presented.

10. Emphasis on proper nutrition from infancy to young adult, the beginning of formal education after age six year, the benefits and value of exercise is covered. For the value of exercise he states: (a). It hardens the organs and renders them fit for their functions; (b). It results in a better absorption of food, aids assimilation, and, by increasing the innate heat, improves nutrition; (c). It clears the pores of the skin; (d.) It removes effete substances through the lungs; (e). Strengthen the physique. Vigorous exercise invigorates the muscular and nervous system.

Avicenna's knowledge about the medical writings by eminent physicians/authors before him is evident as in this chapter of Canon of Medicine; Avicenna refers to writings by Hippocrates, Galen, Paulus of Aegina, Aetius, Rhazes, Haly Abbas and others.

The forgoing three leaders of Islamic medicine had remarkable achievements for learning from writings of other historically renowned physicians who preceded them. They added their own clinical experience and knowledge by producing medical texts that were the mainstay of medical learning in European medical schools for centuries to come. In their medical writings, children and their medical care had a prominent place.

**Financial Discloser:** None

**Conflict of Interest:** None to declare

**Clinical Trial registration:** Not applicable

## References

- Ghavidel H. The History of Medicine in Ancient Persia. Press TV 2008, 1 – 28. Posted January 29, 2008
- Elgood C. *A Medical History of Persia and the Eastern Caliphate*. London: Cambridge University Press; 1952.
- Shoja MM, Tubbs RS. The history of anatomy in Persia. *J Anat*. 2007; **210**: 359 – 378.
- Miller AC. Jundi-Shapur, bimarestan, and the rise of academic medical centers. *J R Soc Med*. 2006; **99**: 615 – 617.
- Modanlou HD. Historical evidence for the origin of teaching hospital, medical school and the rise of academic medicine. *J Perinatol*. 2010; **31**: 1 – 4.
- Whipple AO. Role of the Nestorians as the connecting link between Greek and Arabic Medicine. *Bull N Y Acad Med*. 1936; **12**(7): 446 – 462.
- Whipple AO. Role of Nestorians as the connecting link between Greek and Arabic Medicine. Bulletin of the New York Academy of Medicine Read before the Section of Historical and Cultural Medicine. New York: Academy of Medicine, January 8; 1936.
- Raju TNK. Soranus of Ephesus: Who was he and what did he do? In: Smith GF, Vidyasagar D, eds. *Historical Review and Recent Advances in Neonatal and Perinatal Medicine*. Neonatology on the Web, Chapter 27, pages 1-6. Mead Johnson Nutritional Division; 1980. Available from: URL:<http://www.neonatology.org/classics/mj1980/ch27.htm>
- Covington R. Rediscovering Arabic Science. *Saudi Aramco World*. 2007; **58**: 1 – 24.
- Nayernouri T, Zakariya Razi. The Iranian Physician and Scholar. History of Ancient Medicine in Iran. *Arch Iran Med*. 2008; **11**(2): 229 – 234.
- Islamic Culture and the Medical Arts. Al-Razi, the Clinician National Library of Medicine. Available from: URL: [http://www.nlm.nih.gov/exhibition/Islamic\\_medicalislamic\\_06.html](http://www.nlm.nih.gov/exhibition/Islamic_medicalislamic_06.html)
- Modanlou HD. A tribute to Zakariya Razi (865–925 AD), An Iranian Pioneer Scholar. *Arch Iran Med*. 2008; **11** (6): 673 – 677.
- Radbill SX. The first treatise on pediatrics. *Am J Dis Child*. 1971; **122**(5): 369 – 376.
- Shulman ST. The History of Pediatric Infectious Diseases. *Pediatr Res*. 2004; **55**: 163 – 176.
- History of Medicine. Islamic Culture and Medical Arts. The Great Systemizers. NIH U. S. National Library of Medicine.
- Wakim KG. Arabic medicine in literature. *Bull Med Libr Assoc*. 1944; **32**(1): 96 – 104.
- Mahmoud EL, Sous H, Modanlou, HD. Care of the infants and children during the tenth century, Golden Age of Islamic Medicine, by Ali ibn al-Abbas al-Majusi (Haly Abbas, C 980 AD). Poster Symposium presentation at 2012 annual meeting of the Pediatric Academic Societies/Society for Pediatric Research, Boston, Massachusetts.
- Islamic Medicine. Volume 41 and 42. Ali ibn Al-Majoosee. *Kaamil As-Sanaa'a at Tibbeeya*. Part I and II. Edited by Fuat Sezgin. Frankfurt am Main, Germany: Institute for the History of Arabic-Islamic Science at Johann Wolfgang Goethe University; 1966.
- Modanlou HD. Avicenna (AD 980 to 1037) and the care of the newborn infant and breastfeeding. *J Perinatol*. 2007; **28**: 1 – 4.
- Bakhtiar L. *The Canon of Medicine*. Avicenna Adapted by Laleh Bakhtiar. *Great Books of the Islamic World Inc*. Chicago, IL: Kazi Publications Inc.; 1999: 359 – 368.
- Dunn PM. Avicenna (AD 980–1037) and Arabic perinatal medicine. *Arch Dis Child Fetal Neonatal Ed*. 1997; **77**: 75 – 76.
- The Canon of Medicine (al Qanun fi'l tibb). Avicenna (Abu Ali al-Husayn ibn Abd Allah ibn Sina). Translations by O. Cameron Gruner and Mazar H. Shah. Available form: URL: [www.pdfbooksfree.blogspot.com](http://www.pdfbooksfree.blogspot.com).