
History of Ancient Medicine in Iran

The Otorhinolaryngologic Concepts as Viewed by Rhazes and Avicenna

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Abstract

Iran has a longstanding history and a rich heritage of medicine. Two reputable Persian medical scholars of the Middle Ages are Razi (Rhazes) and Ibn-Sina (Avicenna). Their most important otorhinolaryngologic contributions based on the relevant data from two major medical books i.e., al-Hawi (Liber Continens) and Qanun fi-Tebb (Canon of Medicine) are discussed.

The “Golden Age of Medicine” in Iran was between nineteenth and fourteenth centuries A.D.¹ During this period, the most influential scholars in medicine were flourished. They collected and systematically expanded the Greek, Indian, and Persian ancient medical heritage and made further discoveries.

The most illustrious physicians of this era were Mohammad ibn-Zakariyay-e-Razi (251 – 313 A.H./865-925 A.D.) called Rhazes and Abu-Ali al-Hossein ibn Abdullah better known as Ibn –Sina or Avicenna (370 – 428 A.H./980 – 1037 A.D.). The chief medical work of Rhazes was Kitab al-Hawi fi-Tebb (the Comprehensive Book of Medicine) known in Europe under the title Liber Continens. The Qanun fi-Tebb or as known in the West the Canon of Medicine was the greatest work of Avicenna.² It remained as a standard medical textbook in Europe for nearly 700 years.³

Despite the availability of the valuable studies on history of medicine including otolaryngology, the profound effect of these medieval outstanding medical works on further development of medicine is less discussed.

Mohammad ibn- Zakariyay-e-Razi (Figure 1) was born in Rayy near Tehran. He was the most celebrated clinician of Islamic medicine who gave the first accurate description of smallpox and measles. A. Muller (1848 – 1892), the German Orientalist, called him "the most creative genius of medieval medicine".⁴ Razi was a prolific scholar, and according to S.H. Nasr he initially studied music, then at the age of 30, turned to alchemy and finally relatively late in his life, he learned and practiced medicine.² Several innovations including the discovery of alcohol, sulfuric acid preparation, and making surgical sutures from animals' gut are attributed to Razi. Razi was the director of a hospital in his native city Rayy and later he was appointed as the director-in-chief of the main hospital in Baghdad, Iraq. He wrote on various subjects including medicine, philosophy, theology, astronomy, alchemy, and mathematics. He was a hard working teacher and the author of more than 100 medical books, but his gigantic work in 22 volumes was Kitab al-Hawi. He finished al-Hawi in fifteen years. Actually it was a medical encyclopedia written in Arabic, which was regarded as a classic textbook in European academic centers up to the seventeenth century. It was translated into Latin in 1297 A.D.⁵⁻⁸

The otorhinolaryngologic concepts of al-Hawi

In al-Hawi, various aspects of diseases including ear, nose, and throat disorders are comprehensively discussed (Figure 2). It also contains 33 clinical case reports of those patients who were referred to Razi.⁶

Some of the Razi's otorhinolaryngologic views are as follows:

- The clinical observations of Razi were precise. For instance, a complicated case of chronic otitis media is the third clinical case report in al-Hawi. Razi described the symptoms and signs of a patient

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Figure 1. Left: The picture shows Rhazes examining a sick child, oil painting by the contemporary Persian miniature painter, Hossein Behzad (1894 – 1968), dated: 1964, painted for UNESCO (from *The Life and Works of Miniature Painter Hossein Behzad*, p: 165, by M. Nasseripour, Soroush Press, Tehran, 1999). Right: This stamp was published in 1964, at the celebration of Razi's 1100th birthday.

with recurrent chronic ear discharge who developed facial palsy and meningitis, and eventually died. He reported: "I visited the patient on the third day of the sickness in a very bad condition. The patient was complaining of severe headache, had photophobia, and red eye".⁶

- He described the symptoms of allergic rhinitis i.e., nasal obstruction, running nose, sneezing, and itching nose. He also knew the association between exposure to allergens (such as smelling a rose flower) and occurrence of the nasal symptoms. Razi pointed out: "allergy of the nose may be seasonal and aggravated in spring".⁹⁻¹⁰

-Razi reported the removal of a foreign body (an ingested leech) from the pharynx by the aid of a special instrument.^{7,9,10}

-He suggested the application of pressure on nasal alae to control the bleeding of the nose as well as insertion of the cotton balls in nasal fossae.^{8,9,10}

-Razi used narcotic extract in proper dose to suppress the patient's cough.⁸⁻¹⁰

- He recommended various gargling solutions for decreasing throat pain.^{7,9,10}

-Razi described the tracheostomy technique that is very similar to the procedure, which is currently used. He suggested tracheostomy for cases of upper airway obstruction to save the patients' lives.¹⁰

-He discussed some of the reconstructive surgery of the face, lip, nose, and ear in al-Hawi.

He has pointed out: "these operations must be performed in such a way as to restore the normal appearance of the organ".¹⁰

-Razi classified the nerves as sensory and motor and described seven cranial nerves and assigned a numerical order to the cranial nerves.¹¹

-He gave various prescriptions including pills and external remedies, suppositories, and wines for painful illnesses.¹²

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More than a century after Razi, the so-called Prince of Physicians Ibn-Sina or Avicenna (Figure 3) was born in Afshaneh near Bukhara (in present Central Asia). At that time *Bukhara* was a part of Iran's territory. He spent most of his life in different towns of Iran. Ibn-Sina was a great physician and philosopher and wrote more than 335 books on various subjects. His chief medical book, written in Arabic was called "Qanun fi-Tebb" or Canon of Medicine.¹³

William Osler (1849 – 1919), the well-known professor of medicine, described the Canon of Medicine as "the most famous medical textbook ever written".¹³ It was initially translated into Latin around 1150 A.D. by Gerard of Cermona from northern Italy.¹⁴ When the printing press was invented in 1455, its Latin translation was one of the first medical books that was printed in 1473.³

Subsequently the Latin version was reprinted 36 times in the fifteenth and sixteenth centuries. The Canon of Medicine was a voluminous medical

فهرست ابواب
الجزء الثالث
في أمراض الأذن والأنف والاسنان
من كتاب الحاوي الكبير للرازي

الصفحات	الابواب
٢٠	في أمراض الأذن
٢٠	في عسر السمع والصمم
٦١	في أمراض الأنف
٩٣	في أمراض الاسنان
	في ما يحدث بالصوت وما يجلع خشونة قصبه الرية وفي
١٥٧	بجوهه الصوت
	في القروح الخادنة في فضاء القمكة الى الحلق واللثة والقلاع
	ونزف الدم الكائن من القم من فصد وغيره يتحول إلى طعنا
١٨٣	والأورام الخادنة في القم واللاثة والبيور ونحو ذلك
	في اللحن وما ينشأ في الحلق ويقوم في الجربى وعلاج الخنوق
٢٠٢	والقرين
٢١٥	في حس اللسان
	في الأورام والقروح والتعانق في الحلق والحنائق واللسان
٢١٧	والقهاة والخنوق والبروق وضيق الملع
	باباً في التنفس وتقدمه المعرفة بما يدل عليه وفعله
	في الجسم يتبين أن يلحق كل باب يدل على مرض بذلك
٢٨١	المرض ويؤول طاعنا أيضا

(١) لا توجد اعداد الابواب في الأصل (٢) من طبعه يتبدل الجزء الرابع في الترجمة الايطالية.

Figure 2. Part 3, al-Hawi, related to ear and nose disorders.

work with more than one million words. It consisted of five books including:

-The first book (al-Kulliyat=Universalis) presents general medical principles.

-The second book (Mofradat =Matrica Medica) deals with simple drugs.

-The third book is devoted to diseases occurring in particular parts of the body.

-The fourth book contains general medical topics such as skin rashes, wounds, fractures, luxations, ulcers, and fevers.

-The fifth book deals with compound remedies (Qarabadeyn=Pharmacopoeia).¹³

ENT disorders in Avicenna's Canon of Medicine

In the third book of canon, Avicenna devoted a special part to the ear. He discussed systematically the ear anatomy (chap 1), aural hygiene (chap. 2), ear disorders including their symptoms, signs, and treatment (chap. 3), otalgia (chap. 4), ear tinnitus (chap. 5), ear infection and ulcer (chap. 6), bleeding of the ear (chap. 7), earwax (chap. 8), ear fullness (chap.9), ear trauma (chap. 10), external ear infection (chap. 11), insects in the ear canal and their removal (chap. 13), ear inflammations (chap. 14), and finally the adverse effect of loud sounds on ear (chap. 15). Avicenna pointed out that the pinna was a convoluted plate and the ear canal was curved and designed for collecting sounds. He mentioned a bone, which was hard like stone (the



Figure 3. Ibn-Sina or Avicenna, oil painting by Abolhassan Khan Sedighi (b.1895). The original picture is available at the National Museum of Medical Sciences in Tehran, Iran.

bone that is now called petrous). He also mentioned the nerve of hearing and its companion the facial nerve. According to Avicenna hearing loss can be classified into congenital and acquired types. The congenital hearing loss may be total, severe, or moderate. He suggested the application of bitter almond oil into the ear canal to soften earwax and facilitate its removal. He advised young physicians that the temperature of the eardrops applied into the ear canal should be moderate, not cold nor hot. He described the causes of ear pain, and prescribed medication for each condition.¹⁴

The third book also contains a separate part on the nose including nasal anatomy (chap. 1), drug administration through the nose (chap. 2), smell disorder (chap. 3), nose bleeding and its control (chap. 4), rhinorrhea and flu (chap. 5), and other nasal disorders such as infection, ulcer, obstruction, bone fracture, nasal polyp and masses, dry mucosa, itching, snoring, and sneezing. Regarding the nasal anatomy, he described the bony and cartilaginous parts in detail. For instance, he even mentioned the nasolacrimal duct. Avicenna described the causes of nose bleeding and mentioned that bleeding might be due to the rupture of a network of vessels in the nose. He mentioned different local medications, and nasal packing for controlling the nose bleeding. He mentioned benign masses (such as polyps) and malignant nasal tumors, and pointed out that deformity of the nose might be seen in malignant

masses. Avicenna also discussed the association of nasal itching and allergy.¹⁴

In addition, the throat anatomy and its disorders have been covered in the third book. Ibn-Sina discussed the anatomical structures such as uvula and palatine tonsils in the first chapter of this part. Then, foreign bodies of the throat such as bone fragments (chap. 2), ingested leech (chap. 3), throat inflammations (chapters 4 and 5), and their treatment (chap. 6) are described. Chapter seven is devoted to the inflammation of the tonsils and uvula. In another parts of the book three, oral anatomy, tongue disorders, loss of taste, tongue tie, tongue enlargement (macroglossia), tongue fasciculation, inflammation of the tongue, speech disorders, ranula, burning sensation of the tongue, fissured tongue, oral ulcers, bad odor of the mouth, and oral bleeding and their treatments are discussed. Avicenna described that cutting the uvula might affect voice quality. He mentioned different foreign bodies of the pharynx such as bone pieces and ingested leech, and the procedures for removal by the aid of special instrument. Avicenna described meticulously a technique for tonsillectomy and mentioned the danger of post-operative hemorrhage. He suggested the prone position of the patient after surgery to prevent aspiration. Avicenna recognized the tongue tie (ankyloglossia) as a small bridle under the tongue, attaching it to the floor of the mouth. He suggested that when the lingual frenum appeared to be abnormally short or taut and restricting the tongue movement, it should be cut by an operation but the surgeon had to avoid trauma to the vessels beneath the tongue. He also discussed the possible causes of speech disorders such as brain injury, laryngeal disorders, and tongue problems. Avicenna described the clinical findings of the ranula as a bulging mass resembling a frog beneath the tongue (rana in Latin means frog). The malignant ulcers of the oral cavity and their possible invasion to other neighboring structures have been discussed.¹⁴

Avicenna described tracheotomy, and a method for cleaning upper airway secretions for the treatment of stridor and respiratory distress.¹⁵

He discussed motion sickness or seasickness. He pointed out: "this condition usually incurred in

travel by ship and the symptoms are nausea, vomiting, and dizziness, which subside after the first or second day of traveling".¹⁶

He wrote on pediatric otolaryngologic illnesses such as ear infection, throat inflammation, and oral lesions such as aphthous ulcer.¹⁷

Ibn-Sina passed away in 428 A.H./1037 A.D. at the age 57 and he was buried in Hamedan, Iran.

References

- 1 Ebrahimnejad H. *Medicine, Public Health, and Qajar State, Patterns of Medical Modernization in Nineteenth Century, Iran*. Leiden-Boston: Brill Publication; 2004: 5.
- 2 Nasr SH. *Science and Civilization in Iran*. 2nd ed. Cambridge, UK: The Islamic Texts Society; 1987: 46, 196 – 206.
- 3 Sebastian A. *Dates in Medicine, A Chronological Record of Medical Progress over Three Millennia*. New York, London: The Parthenon Publishing Group; 2000: 5.
- 4 Ullmann M. *Islamic Medicine*. UK: Edinburgh University Press, 1997: 43 – 44.
- 5 Najmabadi M. *The al-Hawi of Razi. Journal of the Iranian Society of the History of Science and Medicine*. 1962; **1**: 48 – 61.
- 6 Najmabadi M. *History of Medicine in Iran after Islam*. 3rd ed. Tehran: Tehran University Press; 2000: 324 – 442.
- 7 Salim-Khan M. *Islamic Medicine*. London, England: Rutledge and Kegan Paul; 1986: 19.
- 8 Nasr ST. *Iran's Immortality*. Tehran: Kayhan Press; 1971: 280 – 281.
- 9 Azizi MH. The ENT implications in the Razi's medical work. *Bulletin of the Iranian Society of the Ear, Nose, Throat & Head and Neck Surgery*. 2004; **11**: 13.
- 10 Mohaghegh M. *Collected Texts and Articles on the History of Medicine and Medical Ethics in Islam and Iran*. Tehran: Soroush Press; 1995: 365 – 366, 352 – 354.
- 11 Souayah N, Greenstein JT. Insights into neurologic localization by Rhazes, a medieval Islamic physician. *Neurology*. 2005; **65**: 125 – 128.
- 12 Haeger K. *The Illustrated History of Surgery*. Gothenburg, Sweden: Nrodbok; 2001: 184, AB.
- 13 Azizi MH. Ibn-Sina, the greatest oriental physician. *Med J Iranian Hospital*. 2000; **3**: 70 – 71.
- 14 Avicenna. *The Canon of Medicine*. Book 3, Part 1, Translated into Persian by A. Sharafkandi (Hajar), 4th ed. Tehran: Soroush Press; 1997: 274 – 2 4, 296 – 320.
- 15 Aziz E, Nathan B, Mckeever J. Anesthetic and analgesic practice in Avicenna's Canon of Medicine. *Am J Chin Med*. 2000; **28**: 147 – 151.
- 16 Avicenna. *The Canon of Medicine*. Book 1. Translated into Persian by A. Sharafkandi (Hajar). 3rd ed. Tehran: Soroush Press; 1985: 434.
- 17 Shulman ST. History of pediatric infectious diseases. *Pediatr Res*. 2004; **55**: 163 – 176.