

Clinical Endocrinology in the Islamic Civilization in Iran

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Endocrinology is the study of cell-to-cell connection by messenger molecules traversing an extra cellular space. It has drawn on the labor of researchers from various branches of science. During the past fifty years, physiology, biochemistry, immunology and molecular biology, especially, have had the greatest impact. However, the development of our understanding of the endocrine system closely parallels the evolution of clinical sciences from prehistoric times to the present. The torch of medicine was in the hands of Muslims in the historical period from ancient Athens to the Renaissance. Iranian medical scientists during the glorious Islamic civilization had a great progress in medicine. Their excellent clinical observations and physical examinations influenced the fields of internal medicine including clinical endocrinology. Here the clinical views of four renowned Iranian clinicians on endocrinology are briefly discussed.

Rhazes

Al-Razi (Latin: *Rhazes* 865-925 A.D.) was born at *Rayy* (Persia). Undoubtedly the greatest clinician of the Islamic world and one of the great physicians of all time and a prolific writer, *Rhazes* is reputed to have been the author of at least 232 treatises on a

wide variety of subjects, including philosophy, music, alchemy, physics, astronomy, mathematics, theology and poetry, in addition to medicine and surgery.¹ His outstanding work, *Al-Judari-wal-Hasbah*, a book dealing with smallpox and measles, is one of the most authoritative books on the subject, even to the present day. It was translated into Latin and other European languages and was published more than forty times between 1498 and 1866.²

Rhazes' renown rests primarily on the voluminous and comprehensive *Kitab al-Hawi fi al-tibb* (The Comprehensive Book on Medicine) that has become known in Latin under the title "*Continens Medicinae*".³ In it, he included extracts from earlier authors regarding diseases and therapy and also documented his own clinical cases. Some appreciation of the book's influence may be derived from the realization that a Latin translation was one of the nine works comprising the library of the Faculty of Medicine of Paris in 1395, and the ninth book dealing with pharmacology was studied in Europe until long after the Renaissance.⁴

Rhazes referred to diabetes and disorders of sex organs in *Kitab al-Hawi*. In his treatise on practical pharmacology "Aghrabadin; therapeutic" he introduced complex remedies for treatment of galactorrhea, impotence, polyuria, menstrual irregularities and obesity. *Rhazes*, in his pragmatic clinical approach, advocated appropriate nutrition in preference

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to drugs in treatment. In the ninth chapter of the treatise on nutrition, he gave the basis of nutrition in medicine and the beneficial and harmful effects of foods on health. In *Tebb al-Phoghara*, a general treatise for people, on medicine for someone who is unattended by a physician and his treatise about libido *Kitab al-Bah*, he referred to sexual dysfunction and its therapeutic outline in the use of male and female aphrodisiacs.⁵ In the *Khulasai-al Tajarib* or "Quintessence of Experience", he discusses in detail the sex organs and contraception.⁶

Haly Abbas

Ali ibn al-Abbas-al-Majusi, known in the west as *Haly Abbas*, died in 994 A.D. He was the author of a celebrated work *Kitab-al-Maliki* known in Latin as "Liber Regius", an excellent and compact encyclopaedia dealing with both the theory and practice of medical science. This book was standard Arabic text even before Avicenna's *Canon* came upon the scene.⁷ Early Christian translators introduced the works of *Haly Abbas* to the West, especially his surgical writings, the section on anatomy of *Liber Regius* being the main source of knowledge for the next hundred years, even at Salerno.

In the Bomberg Surgery of the 12th century, in Chapter 33, which seems to have been copied from *Liber Regius* of *Haly Abbas*, removal of goiter by surgery is advised as follows:

The skin is cut lengthwise and the tumor is withdrawn with all material adherent to it. If you wish to be certain of this, you may cauterize with a large iron the whole interior of the cavity from which you have extracted the goitre. Care should be taken that the pulse of the nerves are not injured in surgery of this kind. If, however, such an accident occurs, you should suture or ligate each side of the wound. If you do not wish to cauterize when the tumour is removed, search diligently to make sure that nothing remains, for if anything remains, it will form again as before. When the region has been completely

cleaned out, it is partly sutured and red powder is applied. A cloth is placed on the wound so that treatment proceeds as stated already, but without a poultice.⁶

Avicenna

Avicenna (980-1037) is perhaps the best-known name of all Iranian physicians in the Islamic civilization. He was also a prolific writer, for he composed nearly 270 different treatises, many of them medical. When he died in 1037, he was held in high regard and compared to Galen. *Avicenna* in his masterpiece *al-Quanun (Canon)*, containing over a million words, described complete studies of physiology, pathology and hygiene.⁸ In fact, until the mid-seventeenth century, the medical curriculum of the Christian universities, including those in the British Isles, was based on *Avicenna's* writings.⁷ *Avicenna* gave a good account of diabetes mellitus, describing the abnormal appetite and the collapse of sexual functions and he documented the sweet taste of diabetic urine. He spoke of primary and secondary diabetes, just as *Aretaeus* did, and also described diabetic gangrene. As to his treatment of diabetics, repetition of his prescriptions in modern times has shown that his mixture of lupine, trigonella (fenugreek), and zedoary seed, produces a considerable reduction in the excretion of sugar.⁶

In the chapter on "thirst", he discussed differential diagnosis of polyuria including 22 conditions in addition to diabetes mellitus.⁹ In the "polyuria chapter" he described diabetes insipidus very precisely for the first time;¹⁰ however Johann Peter Frank (1745-1821) is widely known to be the first to have defined diabetes insipidus and differentiated it from diabetes mellitus; calling it "diabetes insipidus" or "spurious", a diabetes without glycosuria.⁶ *Avicenna* also gave an excellent description and explained therapeutic measures for hypoglycemic coma, bulimia and abnormal appetite in the *Canon*.¹⁰

In the chapter on the "complications of obesity" in the *Canon*, we encounter obesity and its pathophysiology and complications including stroke. *Avicenna* discussed the association of obesity and sexual dysfunction, amenorrhea and infertility. In his pathophysiological description of impotence, he suggested that the brain is one of the six pathologic centers. *Avicenna* described the pathophysiology of amenorrhea, infertility and their therapeutic management in detail.¹¹ He also gave a complete anatomic description for ambiguous genitalia and recommendations for plastic surgery of clitoromegaly.⁹

Jurjani

The most important systematic medieval Persian medical encyclopedia, "The Treasure of Khvarazm Shah" was composed by *Ismail ibn al-Husayn al-Jurjani*, written after he moved, in 1110, to *Khvarazm*, a northern province of Persia. However, although this medical encyclopedia is greatly dependent upon the *Canon* by *Ibn Sina*, it still displays a great breadth of learning and incorporates ideas not to be found in the *Canon*. "The Treasure of Khvarazm Shah" is composed of ten books (*Kitabs*): the first two concern anatomy and physiology, the third is on hygiene, the fourth on diagnosis and prognosis, the fifth on fevers, the sixth on diseases particular to a part of the body, the seventh on surgery, the eighth on skin diseases, the ninth on poisons and antidotes, and the tenth on medicaments, both simple and compound.¹²

"The Treasure of Khvarazm Shah" was among the earliest medical works to associate exophthalmos with goiter,⁶ something that was not repeated until referred to by Calb Pary (1755-1822) of Bath in 1825, and later by Robert Graves (1795-1853) and Carl von Basedow (1799-1854). In 1884, Ludwig Rehn (1849-1930) reported relief of both toxic symptoms and dyspnea by thyroidectomy, and

suggested that overactivity of the thyroid was responsible for the toxicity. In 1893, William Greenfield (1846-1919) of Edinburgh described hyperplasia of the thyroid in this condition, but the idea of hyperthyroidism remained controversial.¹³ However, the association between goiter and palpitation had been revealed by *Jurjani* in his novel encyclopedia.¹⁴

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