

Changing Concept of Sciatica: A Historical Overview

Mamak Hashemi^{1,*} and Farzin Halabchi²

¹Research Institute for Islamic and Complementary Medicine (RICM), Tehran, IR Iran

²Sport Medicine Research Center, Medicine School, Tehran University of Medical Sciences, Tehran, IR Iran

*Corresponding Author: Mamak Hashemi, Research Institute for Islamic and Complementary Medicine (RICM), Tehran, IR Iran. Tel: +98-9109146430, Fax: +98-2133116726, E-mail: m-hashemi@tums.ac.ir

Received 2014 June 15; Revised 2014 September 9; Accepted 2014 September 29.

Keywords: Bile, Blood, Humor, Sciatica, Traditional Medicine

Dear Editor,

Low back pain and sciatica have been considered as the common morbidities of human kind throughout the history. The explanation of the etiology has been changed during the centuries and still remains a dilemma. Reviewing ancient theories may lead to novel findings about the etiology and its better treatments.

First writings about sciatica: among available iranian traditional medicine (ITM) books, the oldest writing about sciatica syndrome was found in "Adab al-Tabib," a book on medical ethics in the 2nd century AH (719 Ad - 816 AD). In this book, sciatica is mentioned as a chronic and poor prognosis disease, which agitates the physicians.

The oldest textbook discussing sciatica is "Ferdos-al-Hekmah," a medical book by Ali ibn Sahl Rabban al-Tabari lived in 260 AH (9th century AD). He described the etiology, risk factors (individual, environmental, sexuality), and therapies (medical and manual) for this disease. One of the complex drugs formulated in this book is attributed to Masarjawaih, a Jewish physician in 1st century AH (7th century AD) (1).

After Tabari, Rhazes (865 AD - 925 AD) described sciatica in one exclusive chapter of his comprehensive textbook on medicine; Al Havi (Liber Continent). He cited the former physicians' ideas like Ibn Masouyeh (857 AD) besides his own idea and practices about this disease (2).

Definition, etiology, and treatments of sciatica were explained in the most Persian and Arabic medical books until 14th century AH (19th century AD) like "al-harooniah treatise," "Golden treatis," "K mil al-Sina al TibbiyaK mil al-Sina al Tibbiya" Mansuri-fi-Teb, Qanun fi al-Teb (Canon) (3), "Zakhireye Kharazmshahi" (4), "Sharhol asbab," "Taqwim al-abdan" (5), "Kaholasa al-Hikmah," "Exir Azam" etc. All authors expressed the same main idea, which has gradually expanded with more comprehensive explanations.

Persian medicine perspective on sciatica: in ITM books,

this problem is called "Ergho Nasaa" which means the pain in "Nasaa" (Noosa, according to Galen) vein pathway in the lower limb. "Ergho Nasaa" has been translated to sciatic and the pain in its location to sciatalgia. However, "Nasaa" refers to a vein, so "Ergho Nasaa" points to the disorder in the pathway of this vein, but nowadays "sciatic" is the name of a specific nerve not vein and sciatalgia refers to pain due to sciatic nerve problems. Despite the misnomer, description of sciatalgia and "Ergho Nasaa" are almost the same.

ITM, like other Humorism systems of medicine holds that the human body is filled with basic substances (4 humors, vapor, and watery fluid). The 4 humors are black bile, yellow bile, phlegm, and blood. Most diseases and disabilities supposedly resulted from an excess or abnormal type of one of these 4 humors.

"Ergho Nasaa" is presumed as substance type joint pains. Tabari was the first one who believed that this disorder is a pain in the nerve which descends from hip to digits due to unfavorable humors mixed in blood, and Avicenna confirmed this idea in his great book; Qanun fi al-Teb of Medicine (6), but thereafter successor physicians agreed that the pathophysiology was infusion of substances (unfavorable humors) from hip joint to "Nasaa" vein. Responsible unfavorable humors enumerated in different books are; atrabillious bile, crude phlegm, dens blood (sanguine), atrabillious blood and crude blood, black bile, or mixture of 4 humors.

The infused humors increase the diameter and decrease the length of "Nasaa" vein. According to this pathophysiology, the treatment aim is to digest and emit the infused substances from the joint and vein by oral and local medications or emit them by venesection. This concept was accepted and gradually developed during centuries in Iranian traditional medicine so far. The latest writings confirming it refer to the 'Exir Azam' book. In this book

of 14th century AH, the role of sciatic nerve is again discussed in the same way that Tabari and Avicenna had described; the substances causing "Ergho Nasaa" are mostly accumulated in hip joint, then infused into the "wide nerve" or sciatic nerve. In addition, response of the "body moderating system" (nature) to painful organ, leads to absorption of the inappropriate substances from whole body, especially upper parts, which are added to the materials formerly collected in that tissue. Sometimes the substances are not present in hip joint and infuse primarily into the "wide nerve". So, Hakim Azam mentioned "Ergho Nasaa" as sciatic nerve disorder, not Nasaa vein, due to substances and humors.

Because the worldwide dominant medical system till 16th century AD was Humoral medicine, it seems that this concept was the only accepted one. After mid-16th century AD, Canon and other Persian medicine textbooks gradually fell out of the syllabus at most European universities.

Domenico Cotugno (1736 - 1822), an Italian physician, associated the pain of sciatic syndrome with the irritation of the nerve by "acrid humors" derived from the blood (7), which was a repeat of the old traditional idea, after about 1000 years and confirms the dominance of this idea till 19th century AD, in the West and not only in Iran and East.

The breakthrough in the ancient idea: in 1934, Mixter and Barr expressed a new etiology for sciatica. They found degenerative changes in disk of patients suffering from sciatica syndrome (8). The idea was quite controversial at the time but has been enforced up to now. In almost all reference textbooks, the etiology of radicular pains in lumbosacral and other spinal regions is described as the mechanical pressure on nerve root by disk pathologies or other masses e.g., hemangioma, tumor, etc.

New findings may support the ancient idea: although lumbar disk excision is now a commonly performed procedure, some uncertainties still exist. Recently, the debate has been raised on the idea of mechanical pressure on the nerve root. The new ideas like non-compressive radiculopathy (radicular pain due to mechanical or chemical irritation without clinical loss of nerve function), inflammation, chemical irritation, and disk vascularization have been discussed in recent articles.

Sciatica electrophysiologically is an ectopic firing originating in a nerve root. The recent concept of chemical

radiculitis implies not only mechanical compression but also chemical irritation contributing to the generation of ectopic firing.

Acute application of nucleus pulposus to dorsal root ganglion without mechanical compression rapidly increases neuronal activity in the thalamus (9). So the action of inflammatory mediators is similar to acrid substances in causing pain. It seems that unfavorable humors may be involved in sciatica syndrome -not just mechanical pressure of herniated disk. The new findings also indicate that the different types of disk herniation have different inflammatory properties (10), which is similar to the idea of traditional medicine regarding the responsibility of various types of substances (unfavorable humor) in different cases with various symptoms and signs.

References

1. Daher M, Tabari H, Stjernsward J, Ammar W, Nabhan TA, Khalil MB, et al. Lebanon: pain relief and palliative care. *J Pain Symptom Manage*. 2002;**24**(2):200-4. [PubMed: 12231145]
2. Zarshenas MM, Mehdizadeh A, Zargarani A, Mohagheghzadeh A. Rhazes (865-925 AD). *J Neurol*. 2012;**259**(5):1001-2. doi: 10.1007/s00415-011-6398-x. [PubMed: 22302275]
3. Minaee B, Abbassian A, Nasrabadi AN, Rostamian A. Prognostic factors of sciatica in the Canon of Avicenna. *Rheumatol Int*. 2013;**33**(12):3095-6. doi: 10.1007/s00296-012-2574-2. [PubMed: 23152089]
4. Hosseini SF, Alakbarli F, Ghabili K, Shoja MM, Hakim Esmail Jorjani (1042-1137 AD): Persian physician and jurist. *Arch Gynecol Obstet*. 2011;**284**(3):647-50. doi: 10.1007/s00404-010-1707-7. [PubMed: 20931210]
5. Tubbs RS, Loukas M, Shoja MM, Ardalani M, Oakes WJ. Ibn Jazlah and his 11th century accounts (Taqwim al-abdan fi tadbir al-insan) of disease of the brain and spinal cord. Historical vignette. *J Neurosurg Spine*. 2008;**9**(3):314-7. [PubMed: 18928231]
6. Avicenna. *Al-Qanon fi al-Tibb (Canon of Medicine)*. Beirut: dar Ihya al-Torath al-arabi; 2005.
7. Boni T, Benini A, Dvorak J, Domenico Felice Antonio Cotugno. *Spine (Phila Pa 1976)*. 1994;**19**(15):1767-70. [PubMed: 7973974]
8. Richard Winn H. *Youmans Neurological surgery in Treatment of disk disease of the lumbar spine*. Philadelphia: Saunders; 2003.
9. Nilsson E, Brisby H, Rask K, Hammar I. Mechanical compression and nucleus pulposus application on dorsal root Ganglia differentially modify evoked neuronal activity in the thalamus. *Biores Open Access*. 2013;**2**(3):192-8. doi: 10.1089/biores.2012.0281. [PubMed: 23741630]
10. Andrade P, Hoogland G, Garcia MA, Steinbusch HW, Daemen MA, Visser-Vandewalle V. Elevated IL-1beta and IL-6 levels in lumbar herniated discs in patients with sciatic pain. *Eur Spine J*. 2013;**22**(4):714-20. doi: 10.1007/s00586-012-2502-x. [PubMed: 23014739]