ORIGINAL ARTICLE

Shajarat al-Tibb (a Tree of Medicine) The History of the Medical Algorithms

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Abstract

The studies conducted so far on the history of the clinical algorithm have not noticed to the works of Ahmad Al Hayati Ibn Muhammad al-Qurashi (917 AH- 1511 AD), who, to the best of our knowledge, was the first person who applied multiple branching algorithms (arborization) to medical books, and his book named *Shajarat al-Tibb* (lit. a tree of medicine) followed the dendritic method (multiple branching algorithms (arborization) in presenting medical information. The book includes brief, yet useful, information, coordinated in a wonderful arrangement of the medical science rules, such as naturals, manuals, symptoms, and treatment arts. Moreover, the book, written at the time of Sultan Beyazid II, was mentioned in the Index of Medical Manuscripts in Turkey. It can be concluded that Ḥayati, Aḥmad ibn Muḥammad was the first medical professor to adopt the use of clinical algorithms. If the translation of his books was available, his research and expertise would be known to more researchers as well.

Key words: Clinical algorithms, Al-Hayati Ibn Muhammad al-Qurashi, History, First medical scholar, Trees, Medicine, Books

Introduction

In the 7th Century, there was a noticeable rise in Islamic civilization worldwide, and many subcultures and languages were integrated into its scope. (Smith, 2004, no page) Based on the Islamic medicine, knowledge, depending on the hypothetical and practical experience, was first established in Greece and Rome. Galen (d.ca. 210AD) and Hippocrates (fifth century BC) were considered and distinguished as the professionals, followed by Hellenic scholars in Alexandria. Besides, Islamic researchers firstly translated their huge manuscripts from Greek into Arabic, then, they created unique medical expertise based on those texts. The Greek civilizations became more accessible, comprehensible, and teachable, as Islamic scholars arranged more systematic medical knowledge of the great Greco-Roman via writing encyclopedias and summaries. (Smith, 2004, no page) Also, depending upon Hellenic medical practice, Islamic medicine settled its own civilizations. Sequentially, later, medieval and early modern scholars in Europe were depended upon Islamic civilizations and translations as the base of their medical innovations. It unquestionably was Arabic translations that the West learned of Hellenic medicine, comprising the workings of Galen and Hippocrates. (Smith, 2004, no page)

One of these Islamic medical manuscripts is a book named *Shajarat al-Tibb* (a tree of medicine) followed the dendritic method (multiple branching algorithms (arborization)) in presenting medical information, and was included useful brief information, coordinated in a wonderful arrangement of the medical science rules, such as naturals, manuals, symptoms, treatment arts.

The book was mentioned in the Index of Medical Manuscripts in Turkey by Ramadan Shishn, page 129, No. 89, number (2045), a Heavy paper book, length: 23.5 cm, width: 14.5 cm, 43 sheets, number of lines, 22 lines; titles and subtitles written by gold. (Qurayshī, and In Zakkūr, 2017, 13-14)

Also, there are a copy of this book, was written by Ahmad Al Hayati Ibn Muhammad al-Qurashi, the chief physician in Damascus in the time of Sultan Beyazid II, and also dedicated to the Sultan in the year 917 AH -1511 AD, Ahmad III Index No. (7369). (Qurayshī, and In Zakkūr, 2017, 13-14)

The studies conducted on the history of the clinical algorithm have not noticed to Ahmad Al Hayati Ibn Muhammad al-Qurashi (917 AH- 1511 AD) work, who firstly applied multiple branching algorithms (arborization) in the medical books.

Furthermore, Komaroff (Komaroff, 1982, pp. 10-12) summarized the history of the clinical algorithms in his article. On the other hand, these clinical algorithms were not accomplished widespread until they were presented as tools to educate new health practitioners (NHPs)-particularly, nurse practitioners and physician assistants. This initial work was directed by Sox and Tompkins, (Sox, Sox, and Tompkins, 1973, pp. 818-824) Vickery and others in the Army's Project AMOS, (Vickery, et al, 1975, pp. 720-725) and by his group in current era (Komaroff, et al, 1974, pp. 307-312).

The work of Ḥayati, Aḥmad ibn Muḥammad, based on the use of clinical algorithms, was not referenced in any historical contexts.

The introduction of the book was written such as this paragraph:

The paragraph in Latin letters:

"bism allah alruhmin alrahim alhamd lilah alqadim bikibriayih alkarim bialayih walsalat ealaa rasulih muhamad walih wa'awliayih wabaed hadhih shajarat altibi

'usuliha mukhabiratan ean haqayiq al'umur altabieiat wa'aghsaniha mushearatan ean aldaqayiq altibiyat 'udrajat fiha alnikkat aleamiqat ma yastalidh bi'iidrakiha aleuqul wawdaeat fiha min alsinaeat al'aniqat ma yarghabuha alhukama' walfuhul wahi mae qlt hajmiha adl wamae gharabat shakliha 'ajl."

The paragraph translated into English:

In the name of Allah, the most Gracious, the most Merciful.

Praise be to Allah, the Superior, and the one known for the generosity, and prayers for the messenger Muhammad and his followers.

Tree of medicine is a book that its roots and branches are about the facts of natural things and the precious medical knowledge. I include deep facts, entertaining the mind, and also add elegant scientific information, which the wise men and the genius wish. This book is more evident with its small size, and it is the greatest with its strangest shape. The manuscript contains these major titles (Table 1).

Table 1: The major titles of the book.

His words in Latin letters	Translation into English
Khutbat alkitab	The introduction of the book
Mawdue altib	The subject of medicine
Al'umur altabieia	The Natural things
'Asnaf al'aeda'	Categories of organs
Alquaa	The powers
Al'afeal-	The actions
Al'alwan--	The colors
Al'aemar wal'ajnas-	Age and sex
Halat badan al'iinsan	The conditions of the Human body
Al'asbab alst aldaruria	The necessary six reasons
'Ajnas al'amrad	The types of diseases
-Alaalamat alddalat alaa 'ahwal al'abdan	The signs indicating body conditions
Alqawl fi alnabd	Chapter on the pulse
Alqawl fi 'ajza' albawl	Chapter on the urine
-Alqawl fi dalayil albaraz	Chapter on the stool
-Alqawl fi fin alelaj	Chapter on the art of treatment
-Qwanin mudawat klin min al'aeda' bialkhusus.	The Treatment guidelines for each organ
Aimtihan al'adwia	Testing of medications
Sinaeat al'adwiat almurakaba	Synthesis of compounded medications
Aikhtitam alkitab bialqawl fi al'amrad alty la takhtasu bieudw dun edw kalhmyat	Conclusion of the book by chapter on diseases that are not specific to an organ without another such as fevers
Fi sayalan ma yasil min al'aeda'	- In what is coming from different organs
Alaihtiqan	Organ congestion
Alwirm almurkab	Complex tumors
Khatimat alkitab walaintiha' min tahririh	Conclusion of the book and the completion of its editing

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I chose this paragraph about the nervous system in the book (Figure 1).

Figure 1. Photograph showing sheet 6 of Shajarat al-ṭibb (a tree of medicine); in Arabic language. as regard copy write;the book is available on websites as https://www.alukah.net/library/0/76592/

The paragraph in Latin letters:
"aelam 'ana almuhrakat fi almakan hasaha wahid, wahu hisu alquat alnnafidhat min aldimagh walnikhae fi aleasb 'iilaa aleadl almuharak lilaieida' almutaharikat bial'iiradat waeadaduha eadad al'aeda' almutaharikat walhikmat fi 'ana aldimagh barid ratb bialtabei,mae kawnuh mabdaan wa'asalu tanbaeith minh alharakat al'iiradiatu, wahu yudim 'amrhma bialhararat wdhlk kan yasirana li'ana aldimagh hu 'asl wamabdaan alfikr wayahtaj 'iilaa 'an yuthbit walhararat shaniha 'an tusrie walthaql walthibat walsukun fi dhalik klh shaniha alburudat wajaeal rutabanaan hataa la yajif bsbb kathrat alharakat walharakat yatbaeuha aljafaf fajaeal rutabanaan litakhil alharakat wala yajafu bi'iifr." (Figure 2)

The paragraph translated into English as below:

As realized, in the place, the motivating force is one sense, causing the brain and the marrow in the nerve to affect the muscles and the determination also causes the limbs to move. In addition, the number of the motivating forces are depended on the number of moving organs. On the other hand, the brain by its nature is cool and wet. Although the brain is the main cause for the voluntary movements, perpetuating their command with heat, the weight, stability and stillness are cool. Furthermore, due to wet nature, it is not dehydrated for the large number of movements. Since the movements followed by dehydration, it becomes wet to imagine the movements and s not dried out extremely. Thus, it is easy to change and quickly accepts whatever is printed in it. Soft nerves, which are

suitable for the sensation and movement with thin nerves for sensation and thick nerves for movement, respectively, grow from the brain as the movements are derived from it. (Figure 3)

The book was mentioned in the Index of Medical Manuscripts in Turkey by Ramadan Shishn, page 129, No. 89, number (2045), Heavy paper book, length: 23.5 cm, width: 14.5 cm, 43 sheets, number of lines, 22 lines; titles and subtitles written by gold. The book was presented to the Sultan Beyazid II in particular; in the year 917 AH -1511 AD, Ahmad III Index No. (7369).
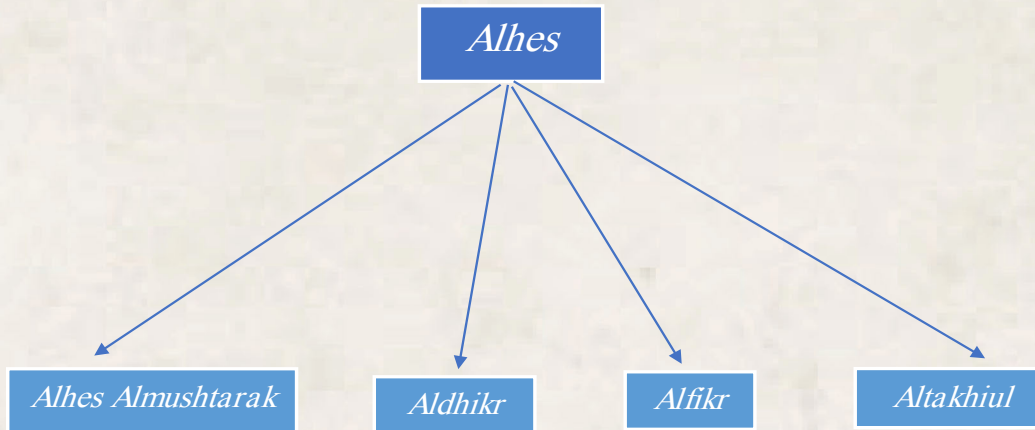
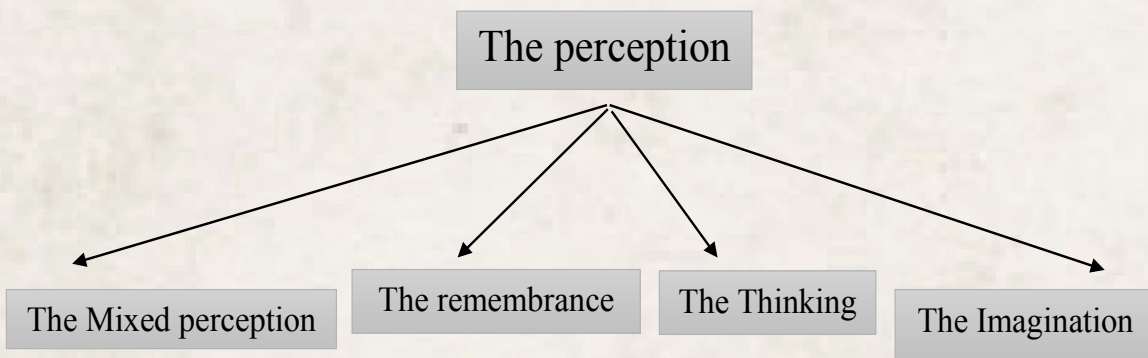*Figure 2. Types of perceptions, including extrasensory perception,in Latin letters*

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Figure 3. Types of perceptions, including extrasensory perception,translated into English.

From this paragraph, I found that he remarked the following:

-The brain processes involved in the planning, initiation, and control of voluntary movement, "*the motivating force is one sense, causing the brain and the marrow in the nerve to affect the muscles and the determination also causes the limbs to move*".

- Motor nerve fibers are thicker than sensory nerve fibers. "*thin nerves for sensation and thick nerves for movement*".

- Thermal regulation and cooling of the brain. "*although it is the origin and principle*

from which the voluntary movements emit, and it perpetuates their command with heat ;and that was easy because the brain is the origin and principle of thought and needs to be stable and the heat will speed up, however; the weight; stability and stillness all these are cool".

- The regulation of water balance in the brain. "*Furthermore, it is made wet so that it does not dehydrated due to the large number of movements; as the movements followed by dehydration, so making it wet to imagine the movements and does not dried out extremely*".

-Brain plasticity. "*And it is easy to change and quickly accepts what is printed in it*".

-Types of perceptions, including extrasensory perception.

Conclusion

It can be concluded that Ḥayati, Aḥmad ibn Muḥammad was the first medical professor to adopt the use of clinical algorithms. If the translation of his books is more available, his research and expertise will be known more as well.

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