



From Food to Drug: Avicenna's Perspective, a Brief Review

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Abstract

The Food and drug were developed by pharmacists and physicians, in particular Persian scientists throughout medical history. There was an especial view on the subject of nutrition and medications in Persian medicine (PM). Avicenna was one of the main Persian physicians who contributed to this field in the Canon of medicine "Al-qanun-fi-al-tibb", his main medical and pharmaceutical text book in the 10th century AD. In this paper, different categorizations of foods and drugs and their definitions in the Avicenna's Canon of medicine were considered and compared with the similar categories in current medicine. These groups of foods and drugs included absolute aliment (Ghidhāol-motlaq), functional foods "Ghidhā od-dawā", pharconutrient "Dawāol-ghadhā", absolute medicament or drug "Dawāol-motlaq", and poisons "Sammol-motlaq". Also, there were several other classifications for foods and drugs in the Canon of medicine that act without their temperaments (qualities) such as "Dho-l-khāsiyyahis". These definitions and classifications 1000 years ago and matching with current accepted terminologies are important both historically and also in the field of traditional pharmacy.

Keywords: history of medicine; medicine; Persian medicine; traditional pharmacy

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Introduction

Nutrition and also medicaments are two important classifications of human's intake can affect body's health. It is clear that the role of food is more than only energy supply, but it includes nutrients that are necessary to improve the health and prevent diseases. Also, there are too many other categories between foods and drugs like functional foods and nutraceuticals. They have been developed alongside the expansion of modern technology [1].

Although, these concepts are new terminologies in medical sciences, foods and drugs have a history as long as human creation; but, they were progressed and developed by physicians and pharmacists during history in different schools of medicines and civilizations [2]. Among all types of traditional and historical schools of medicine such as Ayurveda, Chinese medicine and Persian

Medicine (PM) which dates back to more than 7000 years ago as one of the oldest and most important ones in the history [3]. It was allocated to two main divisions including ancient era (before Islam-until 637AD) and medieval age (Islamic period) [4]. In the Islamic era, Persian physicians like Rhazes (865-9d), Akhawayni (? - 983), Hally Abbas (949-982), Avicenna (980-1037) and Jorjani (1042-1137) were appreciated for considering foods and drugs importance [5-7]. Rhazes mentioned that nutrition played a significant role in having a healthy lifestyle. Foods, not only were considered as essential factors for providing energy, but also were believed to be able to affect the body by changing its temperament [8]. It was believed in PM that temperament was the natural situation and condition of the body and was called as "Mizaj"

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which referred to the aspects of an individual's personality. Everybody may have cool, warm and also dry or wet temperament or a complex condition from two of these factors together [9]. In Persian medicine, using special foods and adjusting patient's diet was the first step of treatment and if proper response was not received, drug therapy was the second choice [10]. There are different classifications for foods and drugs and their intermediate forms in Persian medicine such as "Ghidhāol-motlaq", "Ghidhā od-dawā" and "Dawaol-motlaq" [11], just as similar categorizations in modern medicine such as functional foods, nutraceuticals and pharmaconutrient [12].

Ibn-e-Sīna who is well-known as Avicenna in the west is as the most influential and outstanding scientist in the history of Persian medicine. He was born in Afshaneh village, near Bokhara (old Persia) in 980AD. He had more than 400 books and treaties in particular in philosophy, astronomy, medicine, pharmacy, nutrition and diet. He wrote a special medical and pharmaceutical textbook, the Canon of medicine (Al-qanun-fi-al-tibb) in five volumes in 1025 AD. This book was translated by Gerard of Cremona into Latin in 12th century AD. It became one of the main and basic references that was thought in the western medical schools until 17th AD [7]. It gave comprehensive explanations about single remedies (Mofradat), complex medicines (Morakabat) and different classifications for foods and drugs in volumes 2 and 5 of this book [13,14].

By increasing the attention to integration of Persian medicine for current medicine, in particular in the subject of pharmacy in academy and clinical practices, definition of traditional concepts with current scientific language is necessary. Therefore, definition of such categorizations in Persian medicine and comparing them with current concepts to reach a well-defined term to use in current medicine would be important both historically and for traditional medicine and pharmacy. Therefore, due to the importance of the Canon of medicine as one of the main PM medical reference, we aimed to consider this subject by studying Avicenna's the Canon of medicine and compare its terminologies with current concepts of pharmacy.

Methods

In this paper, volumes 2 and 5 of the Canon of medicine, a unique medical and pharmaceutical textbook, was studied and considered. Different categories and definitions of food and drug in Persian medicine were defined and compared with the categories in current pharmacy and medicine.

Results and Discussion

In Avicenna's the Canon of medicine, there are several categorizations for foods, drugs and their intermediate forms. These classifications have been listed below.

Absolute aliment (Ghidhāol-motlaq)

Avicenna believed that these were a group of foods such as wheat (*Triticum aestivum* L.), soft boiled yolk and soft meat that could not only affect body's function and organs structure, but would also convert to the sources of energy in the body and be a part of the body without changing its functions [10]. It is similar to current categorizations of food which are defined as any nutrition substances that humans or animals eat or plants absorb, in order to keep life and growth. Foods are classified to different groups including vegetables, beans, fruits, grain foods, lean meats and dairy products [15].

Functional foods (Ghidhā od-dawā)

Avicenna believed: "Ghidhā od-dawā influences the body with its substance and quality together" [10]. Also, it was believed that the nutritional role of this group was more than their medicinal effects. It means that the main parts of them have much potential to convert to the source of energy for body. Furthermore, they can affect the body with their special temperament and change body's function with the help of their medicinal quality [10]. These types of components resemble with functional foods in current medicine in definition; but, there are some differences. Functional foods are products that provide the required amount of protein, vitamins, carbohydrates and fats for healthy condition. When, functional foods assist in the treatment and/or prevention of disorders or diseases, they would be named as nutraceutical. The word nutraceutical was made from nutrition and pharmaceutical by Stephen Defelice in 1989, that is considered for enriched or fortified foods

[1,16]. Examples of “Ghidhā od-dawā” have been listed in table 1.

Pharmaconutrient (Dawāol-ghadhā)

According to Avicenna's view, medicinal effects of these foods are more than their nutritional role. On the other hand, they impress the body with their special quality and change temperament of the body, and a little part of them can turn to energy [10]. Approximatively, Pharmaconutrient can be suggested as equivalent for Dawāol-ghadhā. Pharmaconutrient was suggested by Jone and Heyland in 2008 [17]. They believed that recommending special nutrients in supranormal quantity had pharmacological impression on the inflammatory answer to critical disease, could improve clinical outcomes in intensive care unit (ICU) and in patients going under surgery. This group involves macronutrients like glutamine,

arginine and leucine [18,19]. Some examples of dawāol-ghadhā have been shown in table 2.

Absolute medicament (drug) “Dawāol-motlaq”

According to Avicenna's point of view, these drugs when applied, can affect the body and change body function and structure with their cold, hot, wet and dry qualities and they have no nutritional roles [10]. “Dawāol-motlaq” is equaled approximatively with drug in current medicine. Drug is defined as a medicine that has a physiologic impression when enter the body [21]. In table 3, some instances of dawāol-motlaq have been defined.

Poisons (Sammol-motlaq)

In Persian medicine, poisons are a group of drugs which have the same definition with the current concepts [11].

Table 1. Examples of functional foods (Ghidha od-dawa) in the Canon of medicine

Scientific Name [20]	Persian name	Common name	Family
<i>Anethum graveolens</i> L.	Shevid	Dill	Apiaceae
<i>Beta vulgaris</i> L.	Choghondar	Beet	Amaranthaceae
<i>Brassica oleracea</i> L.	Kalam	Cabbage	Brassicaceae
<i>Brassica rapa</i> L.	Shalgham	Turnip	Brassicaceae
<i>Cicer arietinum</i> L.	Nokhod	Chickpea	Fabaceae
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Hendevehneh	Watermelon	Cucurbitaceae
<i>Cucumis melo</i> L.	Kharbozeh	Casaba melon	Cucurbitaceae
<i>Cucumis sativus</i> L.	Khiar	Cucumber	Cucurbitaceae
<i>Cucurbita pepo</i> L.	Kadoo	Pumpkin	Cucurbitaceae
<i>Daucus carota</i> L.	Havij	Carrot	Apiaceae
<i>Hordeum vulgare</i> L.	Jo	Barely	Poaceae
<i>Lactuca sativa</i> L.	Kahoo	Lettuce	Asteraceae
<i>Lens culinaris</i> Medik.	Adas	Lentil	Fabaceae
<i>Mangifera indica</i> L.	Anbeh	Mango	Anacardiaceae
<i>Matricaria chamomilla</i> L.	Babooneh	Chamomile	Asteraceae
<i>Portulaca oleracea</i> L.	Khorfeh	Common Purslane	Portulacaceae
<i>Spinacia oleracea</i> L.	Sfenaj	Spinach	Amaranthaceae
<i>Vigna radiate</i> (L.) R.Wilczek.	Mash sabz	Green gram	Fabaceae
<i>Vitis vinifera</i> L.	Angoor	Grape	Vitaceae

Table 2. Examples of pharconutrient (Dawaol-ghadhā) in Canon of Medicine

Scientific Name [20]	Persian name	Common name	Family
<i>Allium ampeloprasum</i> L.	Tare/ Gandna	Leek	Amaryllidaceae
<i>Allium cepa</i> L.	Piaz	Onion	Amaryllidaceae
<i>Allium sativum</i> L.	Sir/ Soom	Garlic	Amaryllidaceae
<i>Cichorium intybus</i> L.	Kasni	Chicory	Asteraceae
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	Tokhme Hendevehneh	Watermelon seed	Cucurbitaceae
<i>Cucumis sativus</i> L.	Thokhme Khiar	Cucumber seed	Cucurbitaceae
<i>Cucurbita pepo</i> L.	Tokhme kadoo	Pumpkin seed	Cucurbitaceae
<i>Ficus carica</i> L.	Anjir	Fig	Moraceae
<i>Mentha spicata</i> L.	Na na	Spearmint	Lamiaceae
<i>Morus alba</i> L.	Toot	Mulberry	Moraceae
<i>Phoenix dactylifera</i> L.	Khorma	Date	Arecaceae
<i>Solanum nigrum</i> L.	Tajrizi	Black nightshade	Solanaceae

Table 3. Examples of absolute medicament or drug (Dawaol-motlaq) in the Canon of medicine

Scientific Name [20]	Persian name	Common name	Family
<i>Cinnamomum camphora</i> (L.) J. Presl	Kafoor	Camphor	Lauraceae
<i>Cinnamomum verum</i> J. (Presl)	Darchin	Cinnamon	Lauraceae
<i>Foeniculum vulgare</i> Mill	Razianeh	Fennel seed	Apiaceae
<i>Nymphaea alba</i> L.	Niloofer Abi	Waterlily	Nymphaeaceae
<i>Piper nigrum</i> L.	Felfel	Pepper	Piperaceae
<i>Syzygium aromaticum</i> (L.) Merrill & Perry	Mikhak	Clove	Myrtaceae
<i>Zingiber officinale</i> L.	Zanjabil	Ginger	Zingiberaceae

Other food and drug groups

There were several other categorizations for foods and drugs in the Canon of medicine. “Dho-l-khāsiyyahis” was a group including subgroups such as “Ghidhā -o dho-l-khāsiyyah” (like animal oils), “Dawā -o dho-l-khāsiyyah” (like animal antidotes), “Ghidhā od-dawā ī-o dho-l-khāsiyyah” (such as some fruits like apple) [10,11]. It was believed such drugs and foods affect the body in a way not related to their qualities (temperaments).

Nutrition and pharmacy were well developed in Persian medicine during Islamic Golden ages (9-12th century AD) [8]. The medicinal interests of food have been discovered for thousands of years. Persian medicine has supplied evidences, proposing that foods can be efficiently applied as medicine to prevent and treat diseases. Avicenna was one of the well-known and most influential characters in that period. His Canon of medicine could be referred to as a reference book which shows the Persian knowledge in this field in that era. There were too many groups of foods and drugs illustrated in the Avicenna’s book. A number of them like “Ghidhāol-motlaq” (nutrition substances), “Ghidhā od-dawā” (functional foods), “Dawāol-ghadhā” (pharconutrient), “Dawāol-motlaq” (drug) and “Sammol-motlaq” (poisons) had a similar definition with current concepts of medicine; but examples are very diverse. These differences existed because the source of remedies that Avicenna had accessed was different to the current ones. He only accessed to natural products and some of their rare fractions; however, current categorization covers many synthetic drugs and molecules, even in the field of natural products. These definitions and categories are too important both historically and in the field of traditional pharmacy. Currently, too many Persian related concepts to nutrition and foods as well as pharmaceutical remedies are considered for integrative approach in pharmacy

and medicine. Alongside studies on Persian herbal medicines, there are many published works which have evaluated the impact of nutritional issues based on Persian medicine like the importance of food reduction (restriction) [22], the role of nutrition in children growth [23], nutrient-rich versus nutrient-poor foods for depressed patients [24], etc. Therefore, clarifying traditional concepts of foods from drugs is important to reach to understandable and unified definitions to carry out modern studies.

On the other hand, such wide range of definitions for foods and drugs in 1000 years ago is valuable and shows the importance of these subjects in that era in Persian medicine. Also, we can call and define these Persian concepts based on current terminologies.

Conclusion

There are several categories of foods and medications that are commonly used in Persian medicine. These traditional concepts have been compared with current terminologies. The presented concepts are uniform and understandable for modern and current traditional studies. Also, these categorizations in Avicenna’s words for foods and drugs show the importance of this issue in Persian medicine, 1000 years ago.

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Author contributions

Samaneh Soleymani contributed to collect the data and write preliminary draft of the manuscript. Arman Zargaran supervised the project, contributed to make the idea and finalized the final draft of the manuscript.

Declaration of interest

The authors declare that there is no conflict of

interest. The authors alone are responsible for the content of the paper.

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Abbreviations

There is no abbreviation to declare