

Types of headache and those remedies in traditional persian medicine

Mohammad M. Zarshenas^{1,2}, Peyman Petramfar³, Ali Firoozabadi⁴, Mahmood Reza Moein⁵, Abdolali Mohagheghzadeh^{1,2}

¹Research Center for Traditional Medicine and History of Medicine, Shiraz University of Medical Sciences, ²Department of Traditional Pharmacy, School of Pharmacy, Shiraz University of Medical Sciences, ³Department of Neurology, School of Medicine, Shiraz University of Medical Sciences, ⁴Department of Psychiatry, School of Medicine, Shiraz University of Medical Sciences, ⁵Department of Pharmacognosy, School of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran

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ABSTRACT

The history of headache, as a common neurological complication, goes back to almost 9000 years ago. Many ancient civilizations present references to headaches and the coherent treatment strategies. Accordingly, several documents comprising headache complications embodying precise medical information stem from Traditional Persian Medicine (TPM) that can provide useful opportunities for more comprehensive treatment. We conducted a survey on headache through original important pharmacopeias and other important medical manuscripts of TPM which were written during 9th to 19th centuries and have derived all headache categories and herbal remedies. An extensive search of scientific data banks, such as Medline and Scopus, has also been exercised to find results relating to the anti-inflammatory, anti-nociceptive, and analgesic effects of denoted medicinal herbs. The concept of headache and treatments in TPM covers over 20 various types of headache and more than 160 different medicinal plants administered for oral, topical, and nasal application according to 1000 years of the subject documents. Nearly, 60% of remarked medicinal herbs have related anti-inflammatory or analgesic effects and some current headache types have similarities and conformities to those of traditional types. Beside historical approaches, there are many possible and available strategies that can lead to development of new and effective headache treatment from medicinal plants so that this study can provide beneficial information on clinical remedies based on centuries of experience in the field of headache which can stand as a new candidate for further investigations.

Key words: Headache, medicinal plant, traditional persian medicine

INTRODUCTION

Headache is one of the most common neurological complications in the general population. The global reported percentage of headache prevalence is 47%^[1] and it is the fifth most common primary complaint of patients in the USA.^[2] Overall, 96% of people experience headache in their whole life and also the prevalence in females is higher than in males.^[3]

Address for correspondence:

Prof. Abdolali Mohagheghzadeh, Department of Traditional Pharmacy, Faculty of Pharmacy and Pharmaceutical Sciences Research Center, Shiraz University of Medical Sciences, Shiraz, Iran. E-mail: mohaghegh@sums.ac.ir

Headache is a symptom of various diseases which has a history close to mankind creation.^[4] The 9000-year-old Neolithic skulls having trepanation may show the first evidence of headache treatment.^[5] Ancient Egyptian medicine, such as the Ebers Papyrus (1550 B.C.) and others present references to headaches, migraine, and neuralgia.^[4] Before Galen, headaches were classified into three main types as *Cephalalgia* (A mild and short-term headache), *Cephalea* (a type of headache that is chronic and severe), and *Heterocrania* which is a paroxysmal headache on one side of the head.^[6] A new method of treatment was suggested by Galen (129-199 A.D.) by which an electric torpedo fish was applied to the forehead of patient.^[4]

Headache treatment in traditional Persian medicine (TPM) goes back to the 6th century BC; however, most findings are from the medieval period. In that era, physicians observed and diagnosed different headache types and assembled much information on traditional remedies from ancient Greece, Egypt, India, and China to fulfill their own innovative treatment sources.^[7,8]

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Documents of headache subject from TPM have precise medical information on different types and treatments of this disorder. Therefore, this survey has been done to present headache types and remedies during 1000 years in Persia and hope to provide useful opportunities for more comprehensive treatment.

MATERIALS AND METHODS

We have studied printed edition of six original important treatises of TPM, namely *The Liber Continents* by Rhazes (9th and 10th centuries), *Alabnieh an haghagh-ol-advieh* by Aboo mansour Heravi (11th century), *The Canon of Medicine* by Avicenna (10th and 11th centuries), *Ikhtiyarat-e-Badiyee* by Zein al-Din Attar Ansari Shirazi (14th century), *Tohfat ol Moemenin* by Mohammad Tonkaboni (17th century), and *Makhzan ol Advieh* by Aghili-Shirazi (18th century).^[9-14] These are among the most important references and comprehensive pharmacopeias for TPM and also have been widely used by natural healers of Iran.^[15] We studied these pharmacopeias for exact term of headache (*Soda'a*), and gathered recommended herbal remedies in a distinct table.^[9-14] Other books such as "Matching the Old Medicinal Plant Names with Scientific Terminology,"^[16] "Dictionary of Medicinal Plants,"^[17] "Dictionary of Iranian Plant Names,"^[18] "Popular Medicinal Plants of Iran,"^[19] "Pharmacographia Indica,"^[15] "Indian Medicinal Plants,"^[20] "*Seydaneh fit Teb*,"^[21] and botanical descriptions of *Makhzan-ol-Advieh*^[14] were studied for nomenclature of medicinal plants.

On the other hand, headache classification, terminology, and additional descriptions were derived from other Persian medical manuscripts such as *Al-aghras al-tebbieh va al-mabahes al-alayieh* (12th century), *Kholasat-ol-Tajarob* (16th century), *Tebb-e-Akbari* (18th century), and *Eksir-e-Aazam* (19th century).^[22-25] These books which are as clinical texts of TPM cover the Persian Medicine language for nearly 1000 years and show the procedure of improving the traditional medicine in this region.

TPM strategy for headache treatment is almost relieving pain and inflammation. Therefore, for each herbal remedy, we have done an extensive search of scientific data banks such as Medline and Scopus to find results concerning the anti-inflammatory, anti-nociceptive, and analgesic effects.

RESULTS

Persian physicians used the term "*soda'a*" to describe headache. Various classifications and plenty of natural remedies have been described in TPM. In fact, more than 20 types of headache have been noted in TPM which are listed and described in Table 1. This classification was an important element in designing the therapeutic strategy. Also 181 medicinal plants identified to cure this disorder

are mentioned among investigated medical manuscripts. Among these plants, 166 herbs belonging to 77 families are identified and presented in Table 2. The most cited families with useful plants for headache treatment were Asteraceae and Lamiaceae. We omitted plants which were not identifiable. Moreover, common traditional name, route of administration, headache types which can be cured by these reported medicinal plants, and related effects which are analgesic or anti-inflammatory properties are noted. Moreover, similar current types of headache are included in both tables.

DISCUSSION AND CONCLUSION

Persian physicians collected and developed ancient knowledge from other cultures and add them to their experience. The information from selected texts of Persian medicine is gathered from different centuries. Remedies have increased in number and quality of descriptions and show that TPM has significant growth in these 1000 years. TPM presented precise and typical description of headache types and classification [Table 1]. It believes that sudden or irregular alteration of *Dam* (blood), *Balgham* (phlegm), *Safra* (yellow bile), and *Sauda* (black bile) may cause headache and should be balanced. Moreover, it is noted that headache may originate from dissociation of brain connections.^[25,26]

Although herbal medicine was the most common therapeutic strategy for headache in TPM, other natural medicines such as animal and mineral drugs and special therapeutic strategies such as cupping and venesection have been noted that is beneficial in headache treatment.^[14,25] Therapeutic effects of those medicinal plants are attributed to specific analgesic, sedative, or anti-inflammatory properties.^[7] Medicinal herbs with the application of more than 1000 years of TPM strategy are presented in Table 2. The related analgesic or anti-inflammatory effect of about 60% of reported medicinal plants shows that the main objective for headache therapy in TPM is to relieve the pain and inflammation. Moreover, treatment and correction of temperament alteration with plants having contrary temperament is the other therapeutic strategy^[25,26] which has no similarity to modern pharmacology. Therefore, continuing the research is necessary to elucidate the pharmacological activities of herbal remedies being used to treat headache disorders.

Besides variety of plants for treatment, route of administration and dosage forms in TPM are interesting. Plants have been prepared and administered as topical, oral, and nasal dosage forms. The most administered dosage form was topical, while ease of application and patient compliance are additional reasons in considering topical dosage forms. In this application, plants were mixed with vinegar, olive oil, rose oil, barley flour, albumen, herbal juices or milk to increase penetration, decrease unwanted effects, or dilute potent substances.^[7,25,26]

Table 1: Most commonly traditional headache classification and description

Headache traditional type	Short description in TPM ^[22-26]	Current type(s)/condition(s)
Simple headache (<i>Sodaa-e-Sazaj</i>) (Hot, cold, wet, dry)	Caused by internal or external physicochemical and psychological conditions like extra exposure to sun or heat, exercise, anger, cold weather, starving	Tension type headache may be occurred in similar conditions
Corporal headache (<i>Sodaa-e-Maaddi</i>) (Sanguinary, Biliary, Phlegmatic, Melancholic)	Caused by imbalance in four elements with a rise of humors	-
Alcohol-induced headache (<i>Sodaa-e-khomaari</i>)	It is caused following excessive alcohol or wine drinking	Alcohol-induced headache
Bilateral headache (<i>Bayze</i>)	Recurrent headache with severe pain attacks	Near to cluster headaches
Catarrhal headache (<i>Sodaa-e-nazli</i>)	Catarrh is a typical symptom that may be incorporated with this type. Moreover, aching pain and sensation of a heavy weight in the forepart of the head may be distinguished	Compatible with sinusitis or headaches during common cold
Congestive headache (<i>Sodaa-e-saddi</i>)	Resulting from congestion or blockage in brain pathways having blood accumulation	-
Critical headache (<i>Sodaa-e-bohrani</i>)	It is associated with fever and is accompanied by epistaxis	-
Desiccative headache (<i>Sodaa-e-yobsi</i>)	It occurs when body is at odds with excessive dryness and may be associated with apnea	-
Fluting headache (<i>Sodaa-e-Bokhaari</i>)	Like Migrant headache but with no moving pain	-
Headache due to smell (<i>Sodaa-e-shammi</i>)	Odors can affect brain and cause headache	-
Helmet headache (<i>Khooze</i>)	Pain covers the whole head like a galea or helmet	-
Inflammatory headache (<i>Sodaa-e-varami</i>)	It is associated with inflammation in brain membranes like encephalitis or meningitis	Occurs in brain abscess, sinusitis, encephalitis or meningitis conditions
Migrant headache (<i>Sodaa-e-Rihi</i>)	With pain movement through different parts of the head. Tinnitus, head lightness and also nasal dryness must be distinguished in this type	-
Orgasmic headache (<i>Sodaa-e-jemaeee</i>)	It is explosive and severe during or after intercourse	Sexual or coital headache
Participatory headache (<i>Sodaa-e-sherki</i>)	It is associated with other organs (stomach, uterine, liver, spleen and musculoskeletal system may be accompanied). Headache is mostly in occipital part of the head	-
Post-Traumatic headache (<i>Sodaa-e-zarbi</i>)	Head trauma or injuries may predispose the patient to this type of headache	Compatible with post-traumatic headache
Pulsating headache (<i>sodaa-e-zarabaani</i>)	It is defined by existence of pulse around pained areas	Near to types with pulsating feeling
Sleep caused headache (<i>Sodaa-e-nowmi</i>)	It is caused after sleep or that wakes the sufferer from sleep	Hypnic headache
Symptomatic headache (<i>Sodaa-e-arazi</i>)	Caused by systemic disease, neurological disorders	Symptomatic (reflex) headaches
Unilateral headache (<i>Shaghighe</i>)	Recurrent unilateral headache with frequent attacks, with or without palpitation, nausea, vomiting, photophobia	Compatible with basilar migraine
Vermicular headache (<i>Sodaa-e-doodi</i>)	Caused by parasites in cerebral cavities	-

TPM=Traditional Persian Medicine

Another route for drug administration is nasal application which has been significantly applied in headache treatment in TPM. This route is a potentially alternative route for systemic drug bioavailability in parenteral restricted administration.^[27] Easy absorption, rapid onset of action, desirable penetration, avoidance of hepatic first pass effect, and potential for direct drug delivery to the CNS via the olfactory region are some benefits of this kind of drug delivery system which has an important place in modern pharmaceutical sciences.^[28-30] Besides oral or topical application, 47 medicinal plants have been applied nasally for headache treatment and specifically 15 medicinal plants were just administered through this route [Table 2]. This amount of nasally cited medicinal herbs can show that this novel route was fully considered by Persian practitioners.

Although 85 reports on medicinal herbs were related to general headache, other types of headache such as unilateral, chronic, and also headache due to imbalanced humor (sanguinary, biliary, phlegmatic, and melancholic headaches) have various plants to be cured by [Table 2]. Chronic headache with prevalence average rate up to 4% in today's general population^[31] may have no exact TPM description similar to modern medicine, but can be a good candidate for various herbal medications which are noted in Table 2.

In part of headache classification [Table 1], although conformity of traditional headache types with novel classification is not perfect but some denoted headaches such as unilateral, bilateral, sexual, hypnic, pulsating,

Table 2: Headache types and medicinal plants for treatment

Plant family	Plant scientific name	Persian name	Form (s) ^a	Part (s) ^b	TPM headache type (s)	Activity (s) ^c	Texts ^d
Adiantaceae	<i>Adiantum capillus-veneris</i> L.	Barsiaavashaan	T	Lf	Cold, general	AI ^[41]	5,6
Amaranthaceae	<i>Amaranthus blitum</i> L.	Baghle-yamaanie	T	Ap	Sun caused	-	2,5,6
	<i>Beta vulgaris</i> L.	Selgh	N	Rt	General, Unilateral	AI, AN ^[42]	5,6
Amaryllidaceae	<i>Narcissus tazetta</i> L.	Narjes	N	Fr	Phlegmatic, melancholic	-	3,5,6
Anacardiaceae	<i>Mangifera indica</i> L.	Anbaj	O	Ft	Cold	AI, A ^[43]	5,6
	<i>Pistacia lentiscus</i> L.	Mastaki	O, N	Lx	Cold	AI ^[44]	3,5,6
	<i>P. terebinthus</i> L.	Habat-ol-khazraa	O	Ft	General	AI ^[45]	6
Apiaceae	<i>Coriandrum sativum</i> L.	Kazbore	O, T	Sd	Hot	AI, A ^[46,47]	3,4,5,6
	<i>Ferula gummosa</i> Boiss.	baarzad	T	Lx	Phlegmatic	AI, AN ^[48]	2,3,5,6
	<i>F. persica</i> Wild.	Sakbinaj	N, O	Lx	Migrant, phlegmatic	AI ^[49]	2,5,6
	<i>Heracleum sphondylium</i> L.	Saghandulyun	T	Ap	General	-	2,4
	<i>Foeniculum vulgare</i> Mill.	Raazianaj	N	Ft	Phlegmatic	AI, A ^[50]	1
	<i>Peucedanum officinale</i> L.	Bokhurolekraad	T	Ap	Chronic, phlegmatic	AI ^[51]	6
	<i>Pimpinella anisum</i> L.	Anisoon	T	Sd	Cold, unilateral	A ^[52]	6
			N, O		Cold, general	-	2,3,5,6
	<i>Prangos ferulacea</i> (L.) Lindl	Jaavshir	O, T	Lx	General	-	2,3,4,6
Apocynaceae	<i>Nerium oleander</i> L.	Defli	T	Lf	General	AI, AN ^[53]	5,6
Araliaceae	<i>Hedera helix</i> L.	Ashaghe	N	Ap	Chronic	AI ^[54]	2
	<i>Panax ginseng</i> C.A. Meyer	Choobe chini	O	Rt	Melancholic, unilateral	AI, A ^[55]	6
Arecaceae	<i>Phoenix dactylifera</i> L.	Kofarri	O, T	Fr	Hot	AI ^[56]	5,6
Aristolochiaceae	<i>Aristolochia indica</i> L.	Zaraavand	O, T	Rt	Cold, general, unilateral	AI ^[57]	3,6
	<i>Asarum europaeum</i> L.	Asaaron	O	Rt	Participatory	-	6
Asteraceae	<i>Achillea millefolium</i> L.	Hozonbol	O, N	Rt	Chronic, general	AN ^[58]	5,6
	<i>Anthemis pyrethrum</i> L.	Aaghergharhaa	N	Rt	Phlegmatic, unilateral	-	5,6
	<i>Artemisia abrotanum</i> L.	Gheisoom	T, N	Fr	Cold, general	-	1,5,6
	<i>A. absinthium</i> L.	Afsanteen	N	Ap	General	AI, A ^[59]	6
	<i>A. vulgaris</i> L.	Berenjaasf	T	Ap	General, cold	AN ^[58]	2,3,5,6
	<i>Centaurea centaurium</i> L.	Ghantariun	T	Rt	Sun caused	-	6
	<i>Cichorium intybus</i> L.	Hendebaa	O, T	Lf, Sd	General, hot, billiary	A ^[60]	5,6
	<i>Doronicum pardalianches</i> L.	Daroonaj	O	Rt	Phlegmatic	-	5,6
	<i>Eclipta alba</i> (L.) Hassk.	Bahangre	T	Lf	General	A ^[61]	6
	<i>Inula helenium</i> L.	Raasan	T	Ap	Unilateral	-	2,3,6
	<i>Lactuca sativa</i> L.	Khas	T	Lf	General, hot	AI, A ^[62]	5,6
	<i>Matricaria chamomilla</i> L.	Baaboonaaj	O, T	Fr	General, cold	A ^[63]	2,3,5,6
Boraginaceae	<i>Myosotis scorpioides</i> L.	Azaan-ol-faar	O, N	Ap	General, hot	-	2,5,6
Brassicaceae	<i>Brassica nigra</i> (L.) Koch.	Khardal	T	Sd	Cold	A ^[64]	5,6
	<i>B. oleracea</i> L.	Koronob	O	Ap, Sd	General	AI, A ^[65]	5,6
	<i>Isatis tinctoria</i> L.	Katam	T	Lf	Bilateral, migrant	AI ^[66]	6
Burseraceae	<i>Commiphora myrrha</i> (Nees)	Morr	T	Lx	Chronic, general	AI, A ^[67]	3,5,6
	Engl. <i>opobalsamum</i> (L.) Engl.	Bolsaan	O, T	Lf, Sd	Wet, general, chronic	AI, A ^[68]	6
Buxaceae	<i>Buxus sempervirens</i> L.	Boghos	T	Bk	General	-	5,6
Caesalpiniaceae	<i>Caesalpinia bonduc</i> (L.) Roxb.	Bondagh-e-hendi	N	Ft	General, unilateral	A ^[80]	5,6
	<i>Cassia italica</i> Mill.	Sanaa makki	O	Lf	Chronic, unilateral	-	5,6
Capparaceae	<i>Capparis spinosa</i> L.	Kabar	T	Rt	Cold	AI ^[69]	2
Caprifoliaceae	<i>Lonicera periclymenum</i> L.	Shajar-abimalek	T	Lf	General	-	5
Caryophyllaceae	<i>Agrostemma</i> sp.	Khorram	O, T	Fr, Lx	Chronic, general	-	2,4,5,6
Chenopodiaceae	<i>Spinacia oleracea</i> L.	Esfanaakh	O	Lf	General	AI ^[70]	5,6
Cistaceae	<i>Cistus ladanifer</i> L.	Laazan	T	Lx	General, pulsating	-	2,6
Combretaceae	<i>Terminalia bellirica</i> Gaertn	Balilaj	O	Ft	General	A ^[71]	5,6
	<i>T. chebula</i> Retz.	Ahlilaj kaboli	O	Ft	General	AN ^[72]	2,5,6
Convolvulaceae	<i>Convolvulus scammonia</i> L.	Saghmuniaa	T	Lx	Chronic, general	-	4,5,6
	<i>Ipomoea purga</i> (Wender.) Hayne	Cholaapaa	O	Rt	Chronic	-	6
Costaceae	<i>Costus arabicus</i> L.	Ghust	O, T	Rt	Chronic, cold and wet	-	6
			N		General	-	5
Crassulaceae	<i>Sedum roseum</i> L.	Ruzaa arizaa	T	Rt	Cold	-	5,6
	<i>Sempervivum tectorum</i> L.	Abrun	T, O	Ap	General, hot	AN ^[73]	4,5,6
Cucurbitaceae	<i>Citrullus colocynthis</i> (L.) Schrad.	Hanzal	O	Ft	Cold, unilateral	AI, A ^[74]	6
	<i>Cucumis sativus</i> L.	Ghasad	O, T	Ft	Hot	A ^[75]	5,6
	<i>C. melo</i> L.	Ghesaa	T	Ft	Chronic, bilateral	-	4
	<i>Cucurbita pepo</i> L.	Ghar	O, T	Bk, Ft	Hot	-	3,5,6
	<i>Ecballium elaterium</i> (L.) A.Rich.	Ghesaa	O, N	Ft	General, unilateral	A ^[76]	2,5,6

Contd...

Table 2: Contd...

Plant family	Plant scientific name	Persian name	Form (s) ^a	Part (s) ^b	TPM headache type (s)	Activity (s) ^c	Texts ^d
Cupressaceae	<i>Cupressus sempervirens</i> L.	Sarv	T	Ft	Cold, unilateral	-	6
Cuscutaceae	<i>Cuscuta epithymum</i> L.	Aftimun	O	Ap	Participatory	-	6
Cyperaceae	<i>Cyperus rotundus</i> L.	Sod	O, T	Rt	Cold	-	5,6
Elaeagnaceae	<i>Elaeagnus angustifolia</i> L.	Ghobeiraa	O	Ft	Fluting, participatory	AN ^[77]	5,6
Euphorbiaceae	<i>Ricinus communis</i> L.	Kherva	O	Sd	General	AI ^[78]	6
Fabaceae	<i>Alhagi maurorum</i> Medik.	Haaj	N	Ap	Chronic	AI, AN ^[42]	5,6
	<i>Anagyris foetida</i> L.	Anaaghures	O	Lf	General, cold	-	5,6
	<i>Astragalus hamosus</i> L.	Eklilolmalek	O, T	Ap	General, cold	AI ^[79]	2,4,5,6
	<i>Glycyrrhiza glabra</i> L.	Sus	O	Rt	Chronic, unilateral	AI ^[81]	5,6
	<i>Lablab purpureus</i> (L.) Sweet	Lablaab	N, O	Ap	Chronic, general	-	2,4,5,6
	<i>Lupinus termis</i> L.	Termes	O	Sd	Chronic	-	5,6
	<i>Vigna mungo</i> (L.) Hepper.	Maash	O	Sd	Hot	-	5,6
Gentianaceae	<i>Erythraea centaurium</i> Rafn.	Ghantariun	T	Rt	Sun caused, wine caused	AI, A ^[82]	5
Hamamelidaceae	<i>Liquidambar orientalis</i> Mill.	Meiey-e-saaee	N	Gm	General	-	5
Hyacinthaceae	<i>Hyacinthus orientalis</i> L.	Sonbol	N	Fr	General, unilateral	-	1
Iridaceae	<i>Crocus sativus</i> L.	Zafaraan	T	Fr	Cold, general	AI, AN ^[83]	3,5,6
	<i>Iris</i> spp.	Irsaa	T, N	Lf, Rt	Chronic, unilateral	-	2,3,4,6
Juglandaceae	<i>Juglans regia</i> L.	Jowz	T	Bk, Ft	Chronic, unilateral	AI, AN ^[53]	5,6
Lamiaceae	<i>Lavandula angustifolia</i> Mill.	Khazaamaa	O	Fr	General	AI, AN ^[53]	5
	<i>L. stoechas</i> L.	Ostokhoddoos	O	Ap	Cold	-	5
	<i>Marrubium alysson</i> L.	Aalsen	O	Ap	General	-	5,6
	<i>Mentha piperita</i> L.	Nanaa	T	Lf	Cold	AI, AN ^[42]	2,3,4,5,6
	<i>Ocimum basilicum</i> L.	shaahesferam	N, O	Lf	General	AN ^[84]	4,5,6
	<i>O. pilosum</i> Willd.	Faranjmeshk	N, O, T	Lf	Cold	-	5,6
	<i>Origanum majorana</i> L.	Marzanjoosh	O	Ap	Melancholic, migrant	-	6
			T		Cold, General, unilateral		2,4,5,6
			N		Phlegmatic		1
	<i>Teucrium montanum</i> L.	Marmaahooz	N	Ap	Cold	-	2,3,6
	<i>T. polium</i> L.	Joade	T	Ap	Wet	AN ^[85]	6
	<i>Thymus serpyllum</i> L.	Sisanbar	T	Lf	General, hot	-	2,3,4,6
	<i>Vitex agnus-castus</i> L.	Banj angosht	T	Fr, Ft	General	AI ^[86]	2,4
				Lf	Inflammatory		5,6
Lauraceae	<i>Cinnamomum camphora</i> L.	Kaafoor	N, T	Lx	Hot	AI ^[87]	1,2,3,6
	<i>C. iners</i> Reinw and Bl.	Salikhe	T	Bk	Cold	A ^[88]	6
	<i>C. zeylanicum</i> L.	Daarchin	T	Bk	Cold	AI, AN ^[42]	6
	<i>Laurus nobilis</i> L.	Ghaar	O	Sd	Phlegmatic	AI, A ^[89]	6
					Chronic, unilateral		2,4,5
Liliaceae	<i>Aloe vera</i> L.	Sebr	T	Lf	General	AN ^[90]	2,4,5,6
	<i>Colchicum autumnale</i> L.	Sooranjaan	N	Fr	Cold	AI, A ^[91]	3,5,6
	<i>Lilium</i> sp.	Soosan	T	Ap	General	-	5
	<i>Smilax aspera</i> L.	Oshbe	N	Fr	Cold, unilateral	-	6
	<i>Urginea maritima</i> (L.) Baker	Esgheel	O	Rt	Cold, unilateral	-	6
	<i>Linum usitatissimum</i> L.	Kataan	T	Sd	General	AI ^[92]	5,6
Lythraceae	<i>Lawsonia inermis</i> L.	Hanaa	T	Lf	Bilateral, unilateral	AI, A ^[93]	5,6
			O	Fr	General		4,5
Malvaceae	<i>Adansonia digitata</i> L.	Habhaboo	O	Ft	Hot	AI, A ^[94]	5,6
	<i>Corchorus olitorius</i> L.	Malookhiaa	T	Fr	Hot	-	3
	<i>Malva rotundifolia</i> L.	Khatmi	T	Fr	Unilateral	-	3
Meliaceae	<i>Azadirachta indica</i> LC. Juss	Neem	N	Lf	General	AN ^[95]	6
Myricaceae	<i>Myrica nagi</i> Thunb.	Daar shisheaan	O	Bk	Cold	-	5,6
Myristicaceae	<i>Myristica fragrans</i> Hoult.	Basbaase	N	Ft	Phlegmatic	A ^[96]	1,6
			T		General, unilateral		6
			N		Migrant		2
Myrtaceae	<i>Eugenia caryophyllata</i> Thunb	Gharanfol	N, O, T	Ft	Phlegmatic	AI ^[97]	6
	<i>Myrtus communis</i> L.	Aas	T	Lf	Participatory, traumatic	A ^[98]	6
				Ft	Billiary, phlegmatic		6
				Lf	General		2,5
Nelumbonaceae	<i>Nelumbo nucifera</i> Gaertn	Oosbeed	O	Rt	General	A ^[99]	5,6
Nymphaeaceae	<i>Nymphaea alba</i> L.	Niloofer	N, O	Fr	Hot	-	2,6
			T				1,5
	<i>N. lotus</i> L.	Bashneen	N, T	Fr	Hot, unilateral	-	5
Oleaceae	<i>Jasminum officinale</i> L.	Yaasamin	N, T	Fr	Cold, phlegmatic	AI, AN ^[42]	4,5,6
	<i>J. sambac</i> (L.) Aiton.	Fol	T	Ft	General	-	2,3,6
	<i>Olea europaea</i> L.	Zeytoon	O, T	Ap	General, unilateral	AN ^[100]	3,4,5,6

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Table 2: Contd...

Plant family	Plant scientific name	Persian name	Form (s) ^a	Part (s) ^b	TPM headache type (s)	Activity (s) ^c	Texts ^d
<i>Oxalidaceae</i>	<i>Oxalis acetosella</i> L.	Hommas	T	Sd	General	-	5,6
<i>Paeoniaceae</i>	<i>Paeonia officinalis</i> L.	Faavaania	O	Rt	General	-	6
<i>Papaveraceae</i>	<i>Glaucium corniculatum</i> L.	Maamisaa	T	Ft	General	-	5,6
	<i>Papaver somniferum</i> L.	Afyoon	N, T	Bk, Lx	General, hot	A ^[101]	1,2,5,6
<i>Pedaliaceae</i>	<i>Sesamum indicum</i> L.	Samsam	O	Sd	General	A ^[102]	5
			T		Hot, sun caused		2,4
<i>Pinaceae</i>	<i>Cedrus libani</i> Barrel. and Loudon	sharbeen	T	Lx	Cold, general	-	2,3,5
<i>Piperaceae</i>	<i>Piper cubeba</i> L.	Kabaabe	O	Ft	Hot	AI, AN ^[103]	5,6
<i>Plantaginaceae</i>	<i>Plantago ovata</i> Forsk	Bazro ghatoona	T	Sd	General	AI ^[104]	6
					Hot		2,5,6
<i>Poaceae</i>	<i>Hordeum vulgare</i> L.	Jow	O	Sd	General, hot	-	5
			T		Biliary, fluting		6
	<i>Lolium temulentum</i> L.	Zavaan	T	Sd	Cold	-	5,6
	<i>Oryza sativa</i> L.	Berenj	O	Sd	Dry	-	5,6
<i>Polygonaceae</i>	<i>Rheum palmatum</i> L.	Raavand	O	Rt	Cold, unilateral	-	5,6
					Phlegmatic		3
<i>Portulacaceae</i>	<i>Portulaca oleracea</i> L.	Khorfe	T	Ap	General, hot, pulsating	AI, A ^[105]	1,4,5,6
<i>Primulaceae</i>	<i>Cyclamen europaeum</i> L.	Bokhurmaryam	N, T	Ap	Cold	-	1,2
<i>Punicaceae</i>	<i>Punica granatum</i> L.	Rommaan	O	Ap	Hot	A ^[106]	1
<i>Ranunculaceae</i>	<i>Clematis ochroleuca</i> Dill. and L.	Zayyan	N	Fr	General, unilateral		5,6
	<i>Helleborus niger</i> L.	Kharbagh asvad	O	Rt	General, unilateral	-	1,3
	<i>Nigella sativa</i> L.	Shoneez	N	Sd	Cold, chronic	A ^[107]	5,6
			T		Cold		2,4
<i>Rosaceae</i>	<i>Crataegus azarolus</i> L.	Zoaroor	O	Ft	Hot	-	5,6
	<i>Cydonia oblonga</i> Mill.	Safarjal	O	Ft	Chronic, hot	-	5,6
	<i>Potentilla reptans</i> L.	Ghantaafeloon	O	Lf	General	-	2
	<i>Prunus amygdalus</i> L.	Lawz-al-morr	T	Ft	Cold, general	-	2,3,4,5,6
	<i>Prunus domestica</i> L.	Ejjas	O, T	Fr, Ft	Hot	-	5,6
	<i>P. persica</i> (L.) Batsch.	Khookh	T	Sd	Cold, unilateral	-	2
	<i>Rosa canina</i> L.	Nasreen	T	Fr	General	AI, AN ^[108]	2,6
	<i>R. damascena</i> Mill.	Vard ahmar	N, T	Fr	General	AI, A ^[109]	2,5,6
			N, T		Biliary, hot		1,3, 4
			O		General, unilateral		6
<i>Rubiaceae</i>	<i>Coffea arabica</i> L.	Bon	O	Ft	General	-	5,6
<i>Ruscaceae</i>	<i>Ruscus aculeatus</i> L.	Aas barri	O	Ap	Phlegmatic	AI ^[110]	5,6
<i>Rutaceae</i>	<i>Citrus*limon</i> (L.) Burm.f.	Limoo	T, O	Ft, Lf	General, hot	-	5,6
	<i>C. aurantium</i> L.	Naaranj	O, T	Fr	Cold	-	5,6
	<i>C. medica</i> L.	Otroj	N, T	Ft	Cold, unilateral	A ^[111]	1,5,6
			O		Wine caused		6
<i>Salicaceae</i>	<i>Ruta graveolens</i> L.	Sodaab	T	Lf	Chronic, cold	AI, AN ^[42]	2,4,6
	<i>Salix aegyptiaca</i> L.	Khalaaf-al-balkhi	O, T	Lf	General	-	5,6
	<i>S. babylonica</i> L.	Khelaf	O	Lf	General, unilateral	-	1,2,3,6
<i>Santalaceae</i>	<i>Santalum album</i> L.	Sandal	T	Sk	Hot	AI ^[112]	1,2,4,5,6
<i>Sapindaceae</i>	<i>Sapindus trifolius</i> L.	Rateh	N	Ap	General, unilateral	AN ^[113,114]	2,4
<i>Solanaceae</i>	<i>Datura stramonium</i> L.	Jowz-ol-maasel	O, T	Fr	Biliary, chronic	AN ^[115]	5,6
	<i>Hyoscyamus niger</i> L.	Bang	T, N	Ap	Chronic, hot	AI, A ^[116]	5,6
	<i>Mandragora officinarum</i> L.	Lofah	T, N	Ft, Lf	General, hot, sanguinary	-	4,5,6
	<i>Solanum cordatum</i> Forssk.	Hodogh	T	Rt	General, unilateral	-	6
	<i>S. melongena</i> L.	Baademjan	O	Ft	Hot	A ^[117]	5
	<i>S. nigrum</i> L.	Enab-ol-salab	T	Lf	General	AI, A ^[118]	2,6
<i>Taxaceae</i>	<i>Taxus baccata</i> L.	Zaranb	N	Ap	Cold	AI, AN ^[119]	2,4,5,6
<i>Theaceae</i>	<i>Camellia sinensis</i> (L.) Kuntze	Chaay khataai	O	Lf	Cold	AI ^[120]	6
<i>Verbenaceae</i>	<i>Tectona grandis</i> L.	Saaj	T	Ft	Hot	AI, A ^[121]	5,6
<i>Violaceae</i>	<i>Viola odorata</i> L.	Banafsej	N, T	Fr	Hot	A ^[122]	2,3,5,6
			O		Biliary, sanguinary		1,6
<i>Vitaceae</i>	<i>Vitis vinifera</i> L.	Zabib	T	Ft	Hot, sun caused	-	2,4,6
			T		Biliary, sanguinary		5
			N, T	Lf	Chronic, hot		3,6
<i>Zingiberaceae</i>	<i>Alpinia galanga</i> (L.) Willd.	Khoolanjaan	O	Rt	General, cold	A ^[123]	3,6
	<i>Elettaria cardamomum</i> L.	Ghaaghole	N, T	Ap	General	-	2,4,5,6
	<i>Zingiber officinale</i> Roscoe	Zanjebeel	O	Rt	Cold, unilateral	AI, A ^[124]	3
	<i>Z. zerumbet</i> (L.) Roscoe and Sm.	Zoranbaad	T	Rt	General, unilateral	AN ^[125]	3

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Table 2: Contd...

Plant family	Plant scientific name	Persian name	Form (s) ^a	Part (s) ^b	TPM headache type (s)	Activity (s) ^c	Texts ^d
Zygophyllaceae	<i>Peganum harmala</i> L.	Esfand	O	Sd	Chronic	A ^[126]	5,6

^aHerbs part: "Ap"=Aerial parts, "Bk"=Bark, "Fr"=Flower, "Ft"=Fruit, "Gm"=Gum, "Lf"=Leaf, "Lx"=Latex, "Rt"=Root, "Sd"=Seed, "St"=Stalk, ^bRoute of administration: "N"=Nasal, "O"=Oral, "T"=Topical, ^cPharmacological effect: "AI"=Anti inflammatory, "A"=Analgesic, "AN"=Antinociceptive, ^dTexts: 1, the book of Alabnieh an haghhaegh ol advieh is written by Aboo manson Heravi (11th century). It is the oldest documented Persian book in the world that has 547 monographs involving simple herbal, animal and mineral medicines in alphabetical order. An original manuscript has 400 pages and is kept in Vienna, 2, *The Canon of Medicine*: The Canon of Medicine is one of almost 450 treatises written by the Persian scientist and physician Ibn Sina. It remained a medical sciences authority up until the 18th century and early 19th century. Ibn Sina has listed 800 tested drugs, including plant, animal and mineral substances, with comments on their application and effectiveness, 3, the book of *Ekhtiyarat-e-Badiyee*, This is a comprehensive Persian pharmacopoeia of simple and compound medicine in 1368 A.D in Shiraz by 'Ali ibn al-Husayn Ansari Shirazi, (1328-1403). The treatise is in two parts containing medicaments in alphabetical order in 28 chapters and description of 1005 simple medicines which are herbal, animal and mineral drugs, 4, *The Liber Continents*, Muhammad ibn Zakariya Razi (865-925)-known as Rhazes in Europe-was a Persian physician, alchemist, philosopher and scholar. Al Hawi fil Tib (The Liber Continents) is his most celebrated work (translated to Latin in 13th century). The 20th and 21th books of LC are on materia medica and describe 898 simple drugs 5, the book of *Tohfah ol Moemenin*, A comprehensive pharmacopoeia of simple and compound remedies in Persian which is written by Muhammad Mumin Daylami Tonkaboni and dedicated to Shah Sulayman, the Safavid ruler of Persia in the 2nd half of 17th century. In this book 763 simple herbal, animal and mineral drugs have been described, 6, the book of *Makhzan ol Advieh*, the largest and one of the latest Traditional Persian pharmacopoeias written by Seyyed Mohammad Hossein Aghili Alavi Khorasani Shirazi (18th A.D) and is the biggest and most important pharmacopoeia containing 28 chapters on drugs in alphabetical order involving 1698 monographs; TPM=Traditional persian medicine

trauma-induced (post-traumatic), fasting, catarrhal (headache attributed to rhino-sinusitis), inflammatory, and alcohol-induced headache are similar to those of modern medicine.^[32-38] Some headache types (simple headache such as hot, cold, wet, and dry headaches) in TPM classification can be related to weather and meteorological variables, starving, or other similar conditions.^[34,39] Described sign and symptoms of vermicular headache in TPM may conduct this type to the headache attributed to infection in International Classification of Headache Disorders.^[32] Another interesting concept in TPM for headache etiology is the participation of internal organs in accompanying with the disorder (participatory headaches). The fact is not yet well determined, but the comorbidity of headache and gastrointestinal complications has been investigated and association between GI complaints and chronic headache may need to be considered.^[40]

Obviously, there are many possible and available strategies that can lead to develop new and effective headache treatment from medicinal plants. Beside historical clarification, this study can provide comprehensive data on clinical remedies based on centuries of experience in the field of headache and thus might lead to perform further clinical trials of these remedies for the treatment of cephalic pain.

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