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Scientific Appraisal of Unani Drugs Used in Neurological Disorders

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Abstract

Background: *Neurological disorders are prevalent and are increasing. The Unani system of medicine provides insights into the pathogenesis, prevention, and treatment of these diseases.* ***Objective:*** *This study explores the Unani perspective on neurological disorders, focusing on therapies and the pharmacodynamics of related medicines.* ***Methods:*** *A comprehensive review of Unani literature was conducted using digital and traditional sources. Unani texts, like "Al Qanoon Fil Tib" by Ibn Sina and "Al Jami ul Mufradat Al Advia Wal Aghzia" by Ibn al Baitar, Kitabul Kulliyat of Ibn Rushd, Akseere Azam of Hakim Azam Khan, and online databases, such as PubMed, Google Scholar, and ScienceDirect, were used. Keywords included "Amraze asab and nafsaniya," "usoole ilaj," "munzij-o-mushile sauda wa Balgham" drugs," "muqawwie asab-o-dimagh drugs," "neuroprotection," "degenerative brain disorders," and "stroke." The information was systematically categorized and examined.* ***Results:*** *A review of Unani literature shows that sue mizaj barid (altered cold temperament) is the fundamental cause of amraze asab and nafsaniya (neurological disorders). These conditions are influenced by active humor, morbid material, and its accumulation in the brain. Unani scholars outline treatments using pharmacological agents with hot properties to restore the altered temperament, which possess deobstruent, lenitive, resolvent, calorific, and disintegrative properties. Their lenitive nature enables penetration and humor breakdown, whereas their calorific and resolvent properties dissolve and expel the accumulated and altered matter.* ***Conclusion:*** *Based on these findings, drugs with specific temperaments and actions are beneficial for rectifying altered temperament and treating the condition. Studies have validated their efficacy in treating neurological disorders.*

Keywords: Amraze asab wa nafsaniya, neurological disorders, Unani concept, Usoole ilaj, Scientific studies

INTRODUCTION

Diseases of the central and peripheral nervous systems are referred to as neurological disorders. These conditions include multiple sclerosis, Parkinson's disease, epilepsy, Alzheimer's disease, brain tumors, and cerebrovascular illnesses such as stroke, migraine, and other headache disorders. Every year, almost 6.2 million individuals pass away from strokes. An estimated 35.6 million individuals worldwide suffer from dementia, and 7.7 million new cases are reported each year. The most prevalent cause of dementia, accounting for most cases of the disease, is Alzheimer's disease. A more recent report from the National Mental Health Survey (NMHS), which was commissioned by the Indian Government, carried out, and managed by the National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore. It states that 7.3% of Indians between the ages of 13 and 17 and approximately 150 million Indians over the age of 18 suffer from various mental illnesses and need mental care services [1].

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Neurological disorders are often not considered common diseases, and many people with mental disorders, like epilepsy, are severely affected by health-related stigma and discrimination [2]. Depressive disorders are one of the most prevalent forms of mental illness and have a huge influence on individuals and society. A study of Unani literature reveals that the description of the nervous system in Unani and modern medicine differs only in the usage of terms and presentations (Figure 1). According to the Unani concept, each organ is furnished with a *Quwwat* (power) through which a specific physiological function is performed by the particular organ. The physiological functions of the nervous system are complemented by *Quwwate nafsaniya* (psychic and mental faculties), in which the brain is the supreme organ and the center of the total system. *Quwwate nafsaniya* are the faculties that carry out all the nervous system's tasks as well as intellectual, sensory, and motor activities in the body. This power is composed of three faculties: *Quwa hassasa wa mudrika* (perceptive faculties), *Quwa muharrika* (motor faculties), and *Quwa tadbeer wa zahan wa fikr* (planning and intellectual faculties) [3].

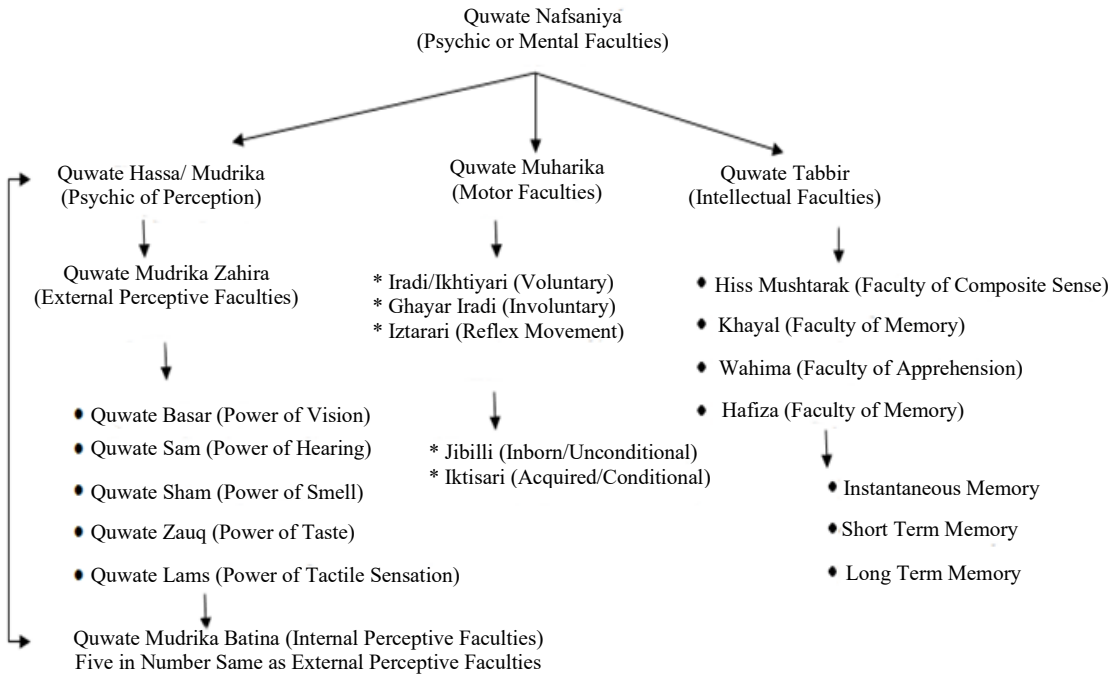

Figure 1. Classification of *Quwwate nafsaniya*.

The classification of *Quwwate nafsaniya* according to *Abu Sahl Masihi* and *Ibn Sina* is mentioned (Figure 1). Quwate mudrika batina are internal perceptive faculties which recognize and perceive the forms and meanings of those particular things that have been perceived by the external senses [4].

Brain disorders are diagnosed based on sensory function and higher mental function, including recalling, thinking, imagination, vision, speculation, and motor function. Clinical symptoms that arise in motor or sensory function include either loss of function or weakness of function. In addition to being costly and requiring lengthy symptomatic treatments, synthetic medications used to treat brain problems often have severe and inevitable side effects and low patient compliance. For various human brain disorders, like Alzheimer's disease, Parkinson's disease, depression, epilepsy, schizophrenia, anxiety, paralysis, etc., herbal remedies are thus recommended over synthetic medications [1]. Traditionally, the Unani medical system has been applied in a variety of dosage forms. The effects of several Unani medicinal plants and their derivatives on central nervous system illnesses have been studied. An alcoholic extract of *Piper longum* L. fruit was found to significantly improve cognitive function [5].

A standardized *Bacopa monnieri (L.) Wettst.* extract has been shown to enhance sadness, anxiety, and cognitive function in older adults. In mice, curcumin has anti-convulsant properties against electric shock seizures [6]. For CNS problems, polyherbal formulations are commonly recommended in the Unani medical system. The plant components in these formulations may work in concert with other components from the same plants in addition to increasing the activity of chemicals or mitigating their harmful effects [7]. Numerous medications with various mechanisms of action have been used by Unani doctors to treat these conditions. The current study aims to investigate the mechanism of action of Unani medicines, the pathophysiology of neurological illnesses, and the course of treatment. To provide accurate and quite thorough information and determine the therapeutic potential for its use as a novel medication, it is necessary to further uncover the relationship between the traditional usage and pharmacological activity.

METHODOLOGY

An extensive bibliographic search was conducted to record the information available in classical Unani literature using various online and offline resources, which were considered. Classical texts translated into Urdu by the Central Council for Research in Unani Medicine, Government of India, were cited, viz., Al *Qanoon Fil Tib* of *Ibn Sina* (980–1037), *Al Jami ul Mufradat Al Advia Wal Aghzia* of *Ibn al Baitar* (1197–1248 AD), *Kitabul Kulliyat* of *Ibn Rushd* (1126–1198 AD), and *Akseere Azam* of *Hakim Azam Khan* (1813–1902 AD). The concept of disease, the methodology by which Unani medications work, their indications, their therapeutic applications, the current state of Unani medication use in neurological diseases, and research in this area have all received a lot of attention. The Central Council for Research in Unani Medicine, together with the World Health Organization, published a book that contains standard Unani medical terminology. Original research and review publications on neurological illnesses that were published online were also taken into consideration. The most pertinent papers were chosen for this evaluation after all abstracts and full-text articles were carefully reviewed. Only peer-reviewed, indexed journals with English-language publications were considered in this review. The plant names included in the book were verified using www.theplantlist.org to ensure they were current, genuine names. Well-known scientific search engines, including PubMed, Google Scholar, and ScienceDirect, were used to look up online papers. *"Amraze asab and Nafsaniya," "Usoole e Ilaj," "Munzij and Mushil e Sauda* and *Balgham* drugs," "*Muqawwie A'saab* and *Dimagh* drugs," "neuroprotection," "degenerative brain disorders," and "stroke" were among the search terms used. The next sections explain the results, which were arranged in accordance with the manuscript outline.

EXPLORATION OF THE UNANI CONCEPT

Concept (Pathophysiology) of Neurological Disorders in the Unani System of Medicine

In the Unani medical system, all material bodies are attributed to *Mizaj* (Temperament: A quality that results from the action and reaction of the opposite qualities of elements that are broken up into little particles to facilitate their mixing). When these elements work together, a state is created that is present in equal amounts in each of the compound's particles [8]. By preserving balance in their *quwa* (power), an organ's specific temperament and the body's overall function are determined [9]. The Unani concept stipulates that there are three ways that all pathological conditions manifest in the body: *Sue Mizaj* (Dyscrasia/immoderate temperament/impaired temperament: the temperament in which the characteristics and amounts of all the constituent parts of a compound are not in line with what that compound is intended for), *Sue tarkeeb* (altered structure) and *Tafarruqe ittesal* (Discontinuity: The breach in the continuity of tissue) (Figure 2). *Sue Mizaj* is the most significant in neurological disorders because the brain is easily influenced by *baroodat* (cold) and *ratubat* (wet). The impaired temperament alters the normal physiology leading to malfunction of the organ or nonfunctioning of the organ as a result of which the internal mental faculty of brain becomes derange which leads to dysfunction of all the faculties. Temperament changes may occur with or without humoral involvement. *Sue Mizaj* and causative matter could appear in three places viz. brain tissues (*Jurme dimagh*) Vessels/nerves (*Urooqe dimagh/asab dimagh*) Meningies of the brain (*Ghishae dimagh*). Alterations in the structure might occur quantitatively or qualitatively in organs, while discontinuity of structure appears in the finest structure

of the cells, tissues, and organs. *Tafarruqe ittesal* (discontinuity) is always followed by *sue mizaj* (altered temperament) and *sue tarkeeb* (altered structure). The intensity and severity of neurological disorders vary widely according to the active humor, nature of the morbid material and its accumulation at specific sites in the brain. The most common causes of neurological disorders are *Sue Mizaj Barid Yabis Sada* (alteration of temperament without humor – only changes in cold and dry qualities) or sue mizaj maddi balghami, saudawi, and damwi (alteration of temperament with phlegmatic, black bile and sanguine humor) [10].

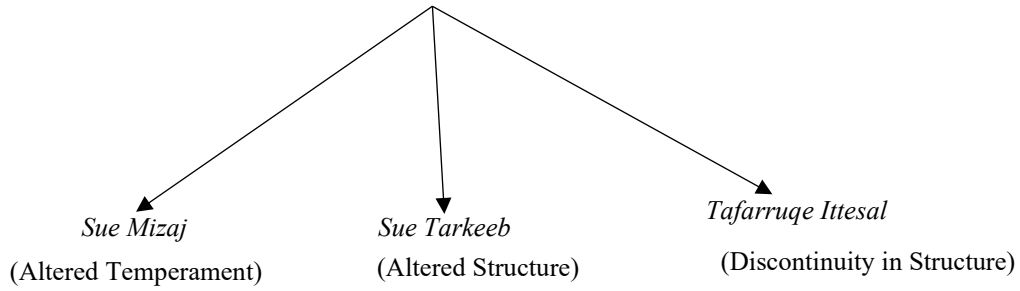

Figure 2. Unani concept of disease.

Principle of Treatment of Amraze Asab wa Nafsaniya (Neurological and Psychiatric Disorders)

The Unani system of medicine has enumerated a well-organized, stepwise treatment plan to cure diseases. *Ibn Sina* stressed the need to manage the disease in its early stages since, if treatment is delayed, the condition takes root and requires continued treatment. The underlying etiology and disorder in Mizaj determine the management approach for neurological illnesses. *Ilaj biz zid* (Heterotherapy) is the basic principle of treatment to normalize the altered temperament [10, 11]. However, prime importance has been given to the rectification of altered temperament. For this purpose, Unani physicians proposed drugs having a temperament, which is opposite to altered temperament of brain and nerves To rectify it. Other drugs used have other mechanism are either given to the patient along with the temperament rectifying agents or when the prevailing state of *Sue Mizaj* has improved.

Mode of Action of Unani Drugs

Unani drugs exert their effect in three ways: Taseerate Kulliya (General actions) *Taseerate shabihae kulliya* (Actions resembling general action) and *Taseerate juzia* (Specific actions). The term "*Taseerate kulliya*" refers to practices that are generally beneficial or detrimental and that nearly immediately affect the whole body. A general action is further divided into *Taseerate oola* (Primary) *Taseerate sani* (Secondary). *Taseerate oola* are of four types *Tashkheen* (warming), *Tabreed* (Cooling), *Tajfeef* (desiccating) and *Tarteeb* (moistening).

Taseerate sani is further divided into two categories: the first is comparable to main action, but it is quantifiable and may be characterized as either mild or intense, for example. Although the word "*Ehteraq*" literally means "*burning out*," it is really used to describe the oxidation of bodily fluids and humors. The bodily fluids get burned because of extreme heat (morbid heat). These acts are simply different, quantifiable, and equivalent degrees of heat and cooling. The second category comprises another set of action but these also emerge from the former and are not bound to the degree of *Mizaj* like *tafteeh* (deobstruent), *tarqeeq* (liquefaction), *talteef* (refining/attenuation), *tahleel* and *taqtee* (resolvent and disintegration). *Taseerate shabihae kulliya* (Actions resembling general action): These drugs produce effect indirectly on the body, e.g., *tanqiya* (Elimination of morbid material from the body) of the whole body can be achieved using diuretic and purgative drugs. *Taseerate juzia* (specific actions) takes place in particular part or organ of the body viz., *muqawwi wa muharrike asab* (nervine tonic and stimulant), *muqawwi dimagh* (Brain tonic), *mufattite hissat* (lithotriptic), *muqawwie jigar* (liver tonic), drugs for piles, jaundice or cancer (Figure 3) [12].

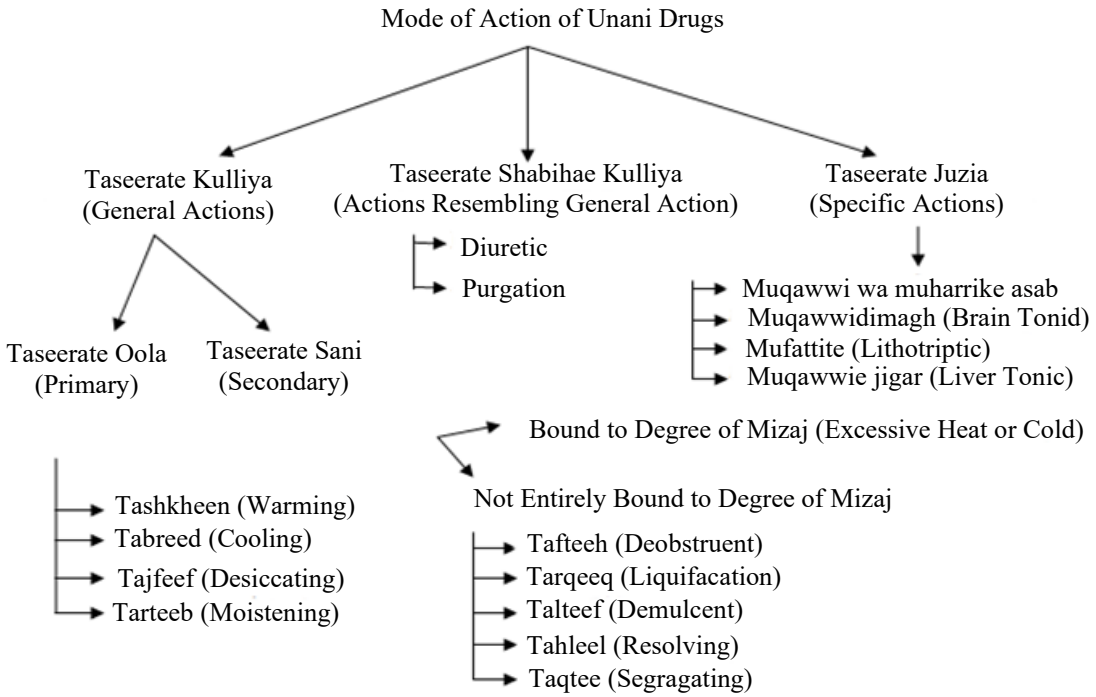

Figure 3. Mode of action of Unani Drugs.

Sue mizaje sada (altered temperament without involvement of humor) is treated by *kaifiyate oola* (primary action) of drugs. *Sue mizaj barid sada* (when the temperature is below normal or blood supply of particular organ is hampered) is common in neurological disorders which is treated by reverting the *sue mizaj* to *mizaj tabai* (normal temperament) only by using drugs and specific regimen known as tadeele mizaj (normalization of temperament). To achieve this, the drugs are used in various dosage forms by different routes viz., *matbookh* (decoction), *zimad* (Paste), *takmeed* (fomentation), *nutool* (irrigation), *tadheen and tila* (paste and liniment). Paste and liniment is applied on the affected part of some oily drugs as oil remains for long duration in the body and produce better effect on nerves eg. *Roghane zaitoon* (Olive oil) and *Roghane katan* (linseed oil) are hot in temperament and are frequently prescribed by Unani physicians for the correction of altered temperament in neurological disorders. These oils produce a beneficial effect in *tasallube asab* (hardness of nerves) caused by *sue mizaj maddi* [13]. *Roghane qust* (*Sassuria lappa*) and *Roghane Handqooqa* (*Trianthema portulacastrum*) have affinity to nerves;, therefore, it is applied. *Zimade khardal* (paste of Mustard seeds) and *Zimade roghane zaitoon* (paste of Olive oil) are considered first-line drugs as they are *musakkhin* (calorific) whereas *Aqerqerha* (*Anacyclus pyrethrum*), *Mavezaj* (*Vitis vinifera*), *Natroon* (*sodium benzoate*), *Khardal* (Brassicanigra), *Filfil siyah* (Piper nigrum), *Farfiyun* (*Euphorbia resinifera*) and *Jundbedastar* (*Castor canadensis*) are *musakkhin* (Calorific) and *muqawwie asab* (nervine tonic), frequently used in these disorders [3].

Sue Mizaj Maddi (Abnormal substantial temperament: An abnormal temperament which is associated with the matter) is alleviated by secondary and tertiary actions of drugs. In *Sue Mizaj maddi*, the treatment of choice is *Tanqiya Mawade Raddiya*, (evacuation of morbid matter) *tadeele Mizaj*, (normalization of temperament) and *taqweate aam* and *taqweae asab* (by providing general and nervous strength). *Tanqiya* (evacuation of morbid matter) is compulsory if morbid matter is dominant either in quantity or quality especially in chronic diseases when the morbid matter remains stagnant it does not move out without modification of its consistency. This modification is done through *munzij advia* (concoctive drugs) followed by *ishal* (purgation) by *mushil advia* (purgative drugs). *Tadeele mizaj* (normalization of temperament) is restoration, normalization, and potentiation of normal physiological

function after purging out of morbid humors. This is achieved through various drugs and treatment procedures such as *inkebab* (fomentation) and massage with hot temperament drugs [3]. several studies reported good results of the above regime, viz., a study was conducted on the evaluation of the efficacy of *tanqiya* and *tadeel* in the motor recovery of *Falij nisfi* (hemiplegia) by using *Joshanda munzij* and *mushil* and massage with *roghane malkangani* [13]. Another study was done on "*efficacy of munzij*, *mushil*, and massage with *Roghane malkangani* in *tashannuje imtilai in falij nisfi*" [14]. In all these studies a better result was observed in comparison to the control to validate the use of this therapy in improving the quality of life in stroke patients.

The drugs which are used in neurological disorders possess *mufattehe sudad*, *muhallil*, *mulattif*, *qate balgham* and *sauda*, *munaqqi akhlate ghaleeza*, *jali*, *mulattife akhlate ghaleeza*, *muhallile warame balghami* and *saudawi* properties (Table 1). By virtue of all these properties the drugs tend to open the obstruction and recanalize the vessels, reduce the inflammatory reaction and edema, and ultimately limiting the neuronal damage by the cumulative action of all the properties thereby are used in diseases such as paralysis, atony, tremor, weakness of nerves, epilepsy, facial paralysis, headache, and other phlegmatic disorders [12, 15–18]. These drugs are used according to the nature of morbid material as the temperament of these drugs is of variable strength. If morbid matter is less in quantity and not much deviated from normal, then mild hot drugs are used. Mild hot temperament drugs are preferred to produce *nuzj* (concoction) in phlegmatic matter because if strong hot drugs are used, they dissolve all *lateef* (subtle) matter and remaining matter becomes more viscous and evacuation will be tedious.

Table 1. Mechanism of action of Unani drugs [12].

Unani terms	English equivalent	Mechanism of action
Munzij	Concoctive	Modify the consistency of morbid humor to make it evacuable from the tissues, vessels and interstitial spaces.
Muhallil	Resolvent	Dissipate the humors by removing them part by part from its attached sites. They act on the viscous humor to make it dissoluble and detachable from its site of pathology.
Jali	Detergent	Remove the viscid and agglutinated matter from the surface of the organ and orifices.
Mulattif	Attenuant	Due to their average heat decompose the humor into less viscid form.
Muqatte	Disintegrative	Penetrate the interstitial spaces of the organ due to their lightness and remove out the humor adhered to the organ.
Mushil	Purgative	Expel the morbid humor from the vessels, neighboring structures and from whole body through intestine.
Mufattehe sudad	Deobstruent	Agitates the humoral matter lying deep in the cavity or orifice and opens the passage.
Muqawwi	Tonic	Normalize the consistency and temperament of the organ so that it cannot accept lesion or injuries. It may be either due to character of the drug or due to its moderate temperament, so that it cools the hot organ or warms the cold organ.

Antiplatelet, anticoagulant, and fibrinolytic medications are used in conventional stroke treatment. These medications have mechanisms like those described by *Munzij Balgham* such as the anti-thrombotic activity of *Glycyrrhiza glabra* [19], the anti-coagulant effect of *Zingiber officinalis* [20], the anti-thrombotic effect of *Apium greveolens* [21], and the anti-thrombotic effect of *Foeniculum vulgare* oil [21]. (Concoctive: an agent which matures and prepares the phlegmatic matter to make it evacuable). These medications possess properties like *Talteef* (attenuant), *Taqtee* (disintegration), and *Tahleel* (resolvent). Less viscous humors do not come out because of their deep penetration into the interstitial tissues, whereas viscous humors cannot leak out because of their sticky and viscous character and adhesion. *Munzij* (Concoctive) medications heal metabolic disorders (humoral derangement) at the level of *Hazm e Uzwi* (tissue-level digestion), which makes it easier for nutrients to assemble and prepare waste products for excretion, which happens through the purgative therapy's expelling process. Many helpful *Munzij Balgham* and *Sauda* medicines (concoctive medicines of phlegm and black bile) are available in the Unani medical system for evacuation from the body (Tables 2 and 3) [12].

Table 2. List of concoctive and purgative drugs of phlegm used in neurological disorders [3, 12].

Munzij e Balgham			
Unani names	***Botanical names***	***Unani name***	***Botanical name***
1. Aslussos	*Glycyrrhiza glabra* Linn	9. Irsa	*Iris ensata* Thunb.
2. Anisoon	*Pimpinella anisum,* Linn	10. Mako	*Solanum nigrum* Linn.
3. Beekh Badiyan	*Foeniculum vulgare* Mill-root	11. Parsionshan	*Adiantum capillus-veneris* Linn.
4. Beekhe karafs	*Apium greveolens* Linn-root	12. Tukhme shibbat	*Anethum sowa* Roxb.
5. Beekhe Izkhar	*Andropogon schaenanthus,* Linn	13. Tukhme karafs	*Apium greveolens* Linn.
6. Beekh kibr	*Caparis spinosa* Linn	14. Ustokhuddos	*Lavendula stoechas.*
7. Brinjasaf	*Achillea millefolium* Linn	15. Zofa	*Hyssopus officinalis* Linn.
8. Hasha	*Thymus vulgaris* Linn		
Mushil e Balgham			
1. Ghareequn	*Agaricus campestris*	1. Maghz fuloos	*Cassia fistula.*
2. Turbud	*Ipomoea turpethum*	2. Sheerae bisfaij	*Polypodium vulgare.*
3. Barge sana	*Cassia angustifolia*	3. Aftimoon	*Cuscuta reflexa.*

Table 3. List of concoctive and purgative drugs of black bile used in neurological disorders [3, 12].

Munzij e Sawda			
Unani names	***Botanical names***	***Unani name***	***Botanical name***
1. Aslussos	*Glycyrrhiza glabra* Linn	9. Gule Banafsha	*Viola odorata* – flower.
2. Anjeer	*Ficus carica*	10. Maweez Munaqqa	*Vitis vinifera.*
3. Badiyan	*Foeniculum vulgare* Mill	11. Parsionshan	*Adiantum capillus veneris* Linn.
4. Barge Badranjboya	*Melissa parviflora* Benth.	12. Sapistan	*Cordia latifolia.*
5. Barge Shaitra	*Fumaria officicnalis*	13. Tukhm Kasni	*Cichorium intybus*-seed.
6. Bisfayaj	*Polypodium vulgare*	14. Tukhm Khatmi	*Althea officinalis.*
7. Gaozaban	*Borago officinalis*	15. Ustokhuddos	*Lavendula stoechas.*
8. Gule Nilofer	*Nymphaea alba* – flower	16. Unnab	*Zizyphus sativa.*
Mushil e Sawda			
1. Amla	*Embelica officinalis* Linn	2. Ghareequn	*Agaricus campestris.*
3. Aftimoon	*Cuscuta reflexa*	4. Gule Gaozaban	*Borago officinalis* – flower.
5. Ayarij Fiqra	*Alove barbadensis*	6. Halela Siyah	*Terminalia chebula* Retz.
7. Barge sana	*Cassia angustifolia*	8. Maghz fuloos	*Cassia fistula.*
9. Bisfaaj	*Polypodium vulgare*	10. Tukhme Kasoos	*Cuscuta reflexa* Roxb.

MUQAWWIAT (TONICS)

The unique feature of Unani system of medicine is the concept of protection of an organ and *quwā* (faculty) consistent with it. Tonic drugs are used with an aim to strengthen the organ and its *quwa* to make them efficient enough to fight the noxious stimuli and protect the organ from aversive effect. The concept of neuroprotection is to preserve the brain's *quwa*, which is essential for sustaining the brain's normal function, while also strengthening and invigorating the brain [22]. By prolonging the brain's tolerance to ischemia, the conventional principal deals with neuroprotection; this includes preventing oxidative stress, mitochondrial malfunction, inflammation, and apoptosis [15, 23]. *Muqawwiat* (tonics) have antagonistic properties to those of *sue Mizaj* (altered temperament). Hence, they normalize the organ to start functioning afresh. *Muqawwiat* (tonic) (Table 2) sometimes act by jauhar (active principle) and sometimes by their primary and secondary actions [11, 12]. Temperament of all tonic drugs (Table 3) is hot and dry in second or third degree, so the altered temperament is restored by virtue of the hot temperament. These drugs are also characterized by the properties of deobstruent, attenuant, resolvent, demulcent to viscous humor, laxative, demulcent to black bile, demulcent to phlegmatic swelling (Table 1). Based on these properties they easily penetrate in the nerves, strengthen the nerves

and brain by drying and evacuation of the excessive fluid of brain. Strength is also provided by the massage of some oils, which have resolvent and tonic properties. They dissolve causative matter and strengthen the nerves [24]. *Roghane darchini* (oil of *Cinnamon zeylanicum*) is effective in resolving the morbid matter from brain it diffuses more quickly when applied locally due to its strong lenitive property. *Roghane qust* (oil of *Sassuria lappa*) is effective in atony and coldness of nerves [15, 16]. The drugs munaqqie and muqawwie dimagh wa asab (evacuate the morbid matter and provide strength to the brain) may play a significant role in stimulating the sprouting of new connections in and around the damaged area to restore the lost function. These drugs are believed to be able to up regulate the function of the undamaged area to help them take over the function of the damaged area easily (Table 4).

Table 4. List of brain and nervine tonic drugs used in neurological disorders [12, 17].

Muqawwie dimagh wa asab drugs			
1. Single Drugs			
Unani names	***Botanical names***	***Unani names***	***Botanical names***
Asaroon	*Valeriana wallichii* D.C	Hilteet	*Ferula foetida* Linn.
Aqerqerha	*Anacyclus pyrethrum* DC	Jadwar	*Delphinium denudatum* Wall.
Azaraqi	*Strychnus nux vomica* Linn.	Jundbedastar	*Castor fiber* Linn.
Asrol	*Rawoufia serpentine* Benth	Malkangani	*Celastrus paniculata* Willd.
Asgand	*Withania somnifera* Dunal	Ood Saleb	*Paeonia officinalis* Linn.
Baladur	*Semicarpus anacardium* Linn	Qust	*Saussurea lappa* C B Clarke.
Beesh	*Aconitum napellus* Linn	Sammulfar	Arsenic.
Daroonaj aqrabi	*Doronicum hookari* Hook (L) Clarke	Waj turki	*Acorus calamus* Linn.
Filfil daraz	*Piper longum* Linn		
2. Polyherbal formulations			
Oral administration			
Majoon azaraqi		Kushta gaudanti.	
Safoofe azaraqi		Khamirah gauzzaban.	
Majoon jograj gogul		Kushta khubsul hadeed.	
Majoone seer Alwi Khan		Habbe azaraqi.	
Majoone filasafa			
3. Topical application			
Roghane azaraqi		Roghanemalkangani.	
Roghane qust		Roghane zaitoon.	
Roghane darchini			

STUDIES ON UNANI DRUGS

Several studies on Unani medications that affect the central nervous system have been conducted. Research has examined the spatial learning [25], anxiolytic action [26], and free radical scavenging activity of *Aslussoos* (*Glycyrrhiza glabra* Linn.) roots and rhizome. According to one study, *Glycyrrhiza glabra* Linn. aqueous extract has a cerebroprotective effect in sodium nitrite-induced hypoxic rats, which may be due to its antioxidant properties [27]. It has been demonstrated that flavonoids reduce brain damage in animal models of stroke. In rats with middle cerebral artery occlusion (MACO), an intraperitoneal injection of 25 mg/kg of glabridin, a flavonoid found in *Glycyrrhiza glabra* Linn., dramatically reduces the localized infarcted volume, cerebral histopathological damage, and apoptosis. Glabridin significantly decreased the amount of malondialdehyde (MDA) in the MCAO rat's brain [28]. Constituents of Acorus calamus Linn. rhizome, particularly α and β-asarone, possess sedative, CNS depressant, behavior-modifying, anticonvulsant, acetyl cholinesterase inhibitory and memory-enhancing activities [29]. *Pimpinella anisum* has been found to reduce infarct volume and have neuroprotective properties [30]. The primary component of *Pimpinella anisum*, anethole, serves as a substrate for the synthesis of many compounds of neuropharmacological relevance such as chloral,

amphetamine, and the anti-convulsant. Furthermore, studies have shown that anise oil affects the hippocampal synaptic plasticity, which is the capacity of a neuronal connection to alter its strength in response to the usage or lack of transmission across synaptic pathways. Anise oil has been shown to inhibit LTP and have a neuroprotective effect, both of which are likely caused by NMDA receptor inhibition [31]. Various constituents isolated from Paeonia species have shown sedative and anti-inflammatory activities and are used for blocking effects on neuromuscular junctions [32]. The chief constituents of Polypodium vulgare are polypodine A and B, which have been shown to possess protective effects in various neurological and neurodegenerative disorders. Foeniculum vulgare essential oil showed significant antithrombotic activity, preventing the paralysis induced by collagen-epinephrine IV injection [31]. A significant cognitive-enhancing activity of the alcoholic extract of Piper longum fruit was also observed. Piper longum has been proved as anti-inflammatory agent, which might protect from the development of inflammatory lesions in brain [33]. Studies conducted by Jeon et al. (2011) [34] revealed that a mix of Piper longum and dihydropiperlonguminine can considerably control the expression of APP (Amyloid Precursor Protein). When the production of this protein is controlled, it is helpful for patients with Alzheimer's disease. Dried rhizomes, stolons, and roots of Valeriana wallichii contain several phytoconstituents in which valerian tends to sedate by stimulating activity of the nerve transmitter GABA that dampens the brain arousal system [35]. *Jal brahmi, mandukparni (Centella asiatica)* contains saponins asiaticosides, asiatic acid, madacassic, and betulic acid, used as anxiolytic, antidepressant, and anti-epileptic agent. It decreases the levels of malonydialdehyde (MDA) with simultaneous increase in the levels of glutathione in the brain [36].

Unani drugs contain saponins; tannin and flavonoid have been shown to possess activity against CNS disorders. Antioxidant activity was observed in *Glycyrrhiza glabra* [37], *Borago officinalis* [31], *Rosa damascene* [38], *Ipomoea turpethum* [39], *Cassia fistula* [40], *Delphinium denudatum* Wall [41]. The antioxidant activity of β-sitosterol isolated from *Delphinium denudatum* Wall was evaluated using the DPPH radical scavenging method, revealing that β-sitosterol traps free radicals in a concentration-dependent manner, with a maximum inhibition of 65.02% at 160 μg/mL [42]. In an AD transgenic mouse, curcumin restored the amyloid pathology and decreased oxidative damage. *Curcumin* was directly injected into the brains of AD animals, which decreased plaque levels and prevented plaque from growing further. *Curcumin*'s potent antioxidant and anti-inflammatory properties also helped to reduce the oxidation and inflammation that are hallmarks of AD symptoms. The neuropharmacological effects and nootropic properties of *Bacopa monnieri* extracts have been well studied. In a rat model of AD, Bacopa monnieri also showed a cognitive-enhancing effect and prevented cholinergic degeneration. Extracts from *Bacopa monnieri* suppressed cellular acetyl cholinesterase activity, protecting neurons against beta-amyloid-induced cell death. Furthermore, neurons treated with the test extract showed reduced levels of reactive oxygen species, indicating that *Bacopa monnieri* inhibited intracellular oxidative stress [42]. According to a study on *Nardostachys jatamansi's* effects on the central nervous system, extracts helped rats with all their chronic fatigue syndrome (CFS) symptoms. CFS caused lipid peroxidation, nitrite, and superoxide dismutase levels to rise, and extract effectively minimized catalase levels. The results show that the test extract has strong antioxidant properties. When given to young and old mice, an alcoholic extract of this plant significantly enhanced memory and learning while also reversing the amnesia brought on by scopolamine and diazepam [43, 44].

CONCLUSION

Unani treatment for *Amraze asab wa nafsaniya* (neurological and psychiatric disorders) is much preferred over synthetic drugs because of various side effects of synthetic drugs ranging from sleep disorders to withdrawal syndromes. Herbal treatment not only improves patient compliance but also there are possibilities of enhancing the bioavailability of many drugs. In recent years experimental studies have indeed evaluated plant origin remedies using modern scientific methods. These studies raised the possibilities of revival of traditional treatment based on evidenced based medicine. Unani drugs used for the treatment of neurological disorders have been scientifically shown to possess promising results. Active constituents extracted from specific parts of various plant origins have proved

to be beneficial. Although some formulations have drawn attention, in depth clinical trials should be conducted which will be a major tool to prove the benefits for a patient.

Conflicts of Interest

There are no conflicts of interest.

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