Tanqiya wa Tadeel (Evacuation and Rejuvenation): The Unani Concept as Evolutionary Basis for Conventional Stroke Management

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INTRODUCTION:

Hemiplegia is the paralysis of either longitudinal half of body with loss of motor with or without sensory functions. The main cause of hemiplegia is stroke which is considered the third main cause of death and disability in India. WHO defined stroke as a rapidly developing clinical signs of focal (at times global) disturbance in cerebral functions, lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin. Stroke was said to be common medical casualty with an incidence of around 100 to 300 per 10,000. Upto 90% survivors among yearly affected people report one or more disabilities. Ischemic or hemorrhagic brain injury limits an individual physically and socially leading him to depression. Falij causes loss of movement and sensation in longitudinal half of the body because the penetration of Roohe Hassas and Muharrirk (sensory and motor transmission of impulses) into the organs may either be arrested or the Roooh may penetrate but the organs may be unresponsive due to Sue Mizaj-e-Aza (Abnormal temperament of organs). The description of Istirkha and Falij in classical Unani literature refers to paralysis. Istirkha simply means paralysis of any organ, the Falij specifically indicates the Istirkha (paralysis) of a longitudinal half of body starting either from head to toe or sometimes below the neck, sparing the head. The acute management of stroke has been focused and well scrutinized, but when it comes to rehabilitation of survivors, conventional medicine has limited approach and effectiveness; the patient are referred for rehabilitation programme such as physiotherapy, which has a restricted role to play as Nang-Hing L quoted that physiotherapy intervention either at home or as outpatient may affect or...
improve the gait speed but not to be clinically significant and hard to maintain.

Causes of Falij

Two major causes are described in classical Unani literature for the occurrence of Falij.

A. Sudda (obstruction):

Obstruction prevents the transmission of Roohe Hassas (sensory impulses) and Roohe Muharrrik (motor impulses) to targeted organs and this obstruction may be due to ligation, abnormal accumulation of Khilt-e-Balgham, inflammation in the passage, and compression or contusion of nerves due to injury.4,5,7

B. Sue Mizaj-e-uzwi (abnormal temperament of organ):

The propagation/transmission of nerve impulses is normal but the organ remains unresponsive to the impulse of Roohe Hassasa and Muharrrika due to Sue Mizaj-e-uzwi owing to abnormal excessive heat (Hararat), cold (Barudat), dryness (Yabusat) or moistness (Ratubat)4,5,7.

Most of the Unani physicians mentioned that Falij is usually caused by quantitative or qualitative disproportion of Khilt-e-Balgham (Phlegm) followed by Khilt-e-Dam (Blood)8,9. Buqrat (Hippocrates) mentioned that people having a tendency of suffering from frequent common cold, and coryza, are more prone to develop Falij. Jalinosas (Galen) wrote that people, having superfluous cold humours in their brains, may develop Falij after sudden exposure to excessive heat and cold 10,11. Ibn Sina (Avicenna) revealed that Falij occurs more in winter than spring season and commonly in people around 50 years of age, inhabiting southern countries, due to production of excessive fluid in their heads owing to specific territorial temperament known as Mizaj-e-Junubi (Temperament of Southern Region)3,12.

Classification of Falij:

Azam Khan classified Falij according to its causes as follow 7.

I. Falij-e-Balghami Ratubi: Qualitatively or quantitatively disproportionate Balgham descends from the brain affecting the nerves by obstructing the routes of Roohe Hassasa and Muharrrika leading to loss of movement and sensation. It is characterized by symptoms of Galba-e-Balgham such as increased sleep, decreased thirst, flabby body and comparatively whitish complexion. Most of the strokes occurring due to athero-thrombo-embolism should fall in this category, having the quintessential feature of obstruction in the vessels by an embolus or thrombus, leading to ischemic stroke and consequential hemiplegia.

II. Falij-e-Damwi: Falij, caused by Imtila-e-Dam (abundance of blood), is characterized by Alamat-e-Ghalba-e-Dam (Signs/Symptoms of abundance of Blood) such as engorged vessels, congested eyes, Haar Malmas and Naab-e-Muntali. The signs and symptoms as mentioned in Unani literature here resemble with those as found in the patients of hemorrhagic stroke, which usually results due to severe hypertension. Ghalba-e-dam (plethora of blood) is synonymous with increased blood volume, leading to hypertension as its severe forms may lead to rupture of blood vessels resulting in hemorrhagic stroke. The engorgement and congestion of the vessels is the result of high blood pressure and specific changes on the retinal surface such as flame shaped hemorrhages, cotton-wool spots and yellow hard exudates produced by the hypertension allude to congested eyes in Unani medicine.

III. Falij-e-Intiqal-e-Bohrani: Falij may develop as a result of Bohran (crisis) in acute critical diseases like meningitis, apoplexy, epilepsy, abdominal colic, hysteria and acute fever. The morbid material, which should usually be evacuated through normal routes of the body, is abnormally diverted towards the delicate and vulnerable structures such as nerves during Bohran by the action of Tabiaty to cause Falij as Tabiaty has inadequate power to evacuate this morbid material completely through normal exit routes due to age or disease related weakness. This is quite evident in cases of pulmonary tuberculosis etc. where the infection may travel to meninges and the brain to cause tubercular meningitis or tubercular cerebral abscess, leading, sometimes, to cranial palsies and variable motor paralysis.

IV. Falij-e-Warami: The underlying cause of this type of Falij is inflammation which is gradual in onset. If, Falij is associated with fever, pain and severe symptoms, it is due to Waram Har and if the symptoms are mild, it is due to Waram Rikhuw. Falij-e-Warami usually develops due to meningitis or encephalitis per se and not as secondary to the infective complication of other organs. It is well known; however, that the complications of meningitis and encephalitis variably result in different types of motor and sensory paralysis, which have been referred to as sequelae of Falij-e-Warami in Unani literature.

V. Falij-e-Wabaiy: Mutaffun Hawa (infected air) affects a large number of people in the same season at a particular place. Falij caused by Mutaffun Hawa is usually affects the left side of the body, associated with congested eyes, vomiting and halitosis. Epidemic encephalitis such as encephalitis lethargic, which gripped the world during 1915-1926 and Japanese encephalitis, still prevalent in northern India, are classical examples of Falij-e-Wabai.

VI. Falij due to vertebral displacement: Falij may occur due to vertebral displacement in either side of the body.

VII. Falij due to fall or trauma: Any injury, trauma, accident, etc. may results in Falij

Based on the parts affected, Falij may be of following types 5,7,9

a. Falij: Paralysis of the longitudinal half of the body.
b. Khala / Falij ma'a Laqwa: Paralysis of half of the body including ipsilateral or contralateral involvement of head and face.
c. Abu Bilqisyaa: Paralysis of whole body except face. This type of paralysis is seen in cervical cord diseases.
d. Sakta: Paralysis of whole-body including head and face. This may be the presentation of hemorrhagic stroke of basilar part of brain.
e. Falij-e-Asfal / Falij-e-Atrafi: This is the Paralysis of lower limb and a manifestation of dorso-lumbar disc diseases.

Signs and Symptoms:

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If the whole body is paralyzed except face, it indicates the effect of Madda-e-Marz (causative matter) on the first vertebrae of spinal cord. If the whole body, including face, is paralyzed, it suggests the Madda-e-Marz (causative matter) is related to brain. Sudden severe headache, engorgement in the vessels of the neck, blurring of vision, cold peripheries, gritting of teeth during sleep, difficulties in movement are some common symptoms found in Falij[13,14].

**MATERIAL AND METHODS:**

The data for the present paper was extracted from freely available English peer-reviewed journal articles and RCTs that predominantly focused on the use of Unani medicine in the management of Falij. The terms Unani, Unani medicine, Mushil, Tadeel, Tanqia combined with Falij were used for search. The Unani literature has been taken from classical Unani treatises such as Kitab al-Hawi fit Tibb by Razi, Alqanoon Fit Tibb by Ibne Sina, Tibb-i-Akbar by Akbar Arzani, Akseer-i-Azam by M.Azam Khan, Zakhira Khawarzam Shahi by Ismail Jurjani, Firdous ul Hibmat by Rabban Tabri, Ghina Muna by Al-Quamir, Mizanat Tibb by Akbar Arzani, Kitab ul Muktarat fit Tibb by Ibn Hubal, Sharah Asaob by Samaranqandi, Kitabul Fakhir fit Tibb by Razi.

**RESULTS:**

It is mentioned that Chronic Falij is very difficult or impossible to treat. Even Falij of low intensity is not easy to treat. Jalinoos stated that if Marz-e-Balgham (phlegmatic disease) such as Falij (hemiplegia) occurs in childhood and no treatment appears promising in restoring the lost functions, the disease fades away with passing years. Qusta described localization of lesion and their prognosis in treatment of neurologic diseases. He described that if patient is able to speak words, the lesion is in spinal cord, and is also easily treatable; if speech is not clear or totally absent, then the lesion is in brain, and is difficult to treat[15].

**Usool-e-Illaj (Line of Treatment):**

Unani physicians advocate to refrain from using strong drugs especially Mushil (Purgative) in the early phase of Falij, spanning 4 to 7 days, which may be extended up to 14 days depending upon the severity of disease. In early phase, Gul-e-Angabin Asli (honey rose water) is advised with lukewarm water and Ayarij mixed with Turyaq (antidote) 1gm or simply Maul Asl (honey water). After 14 days, treatment is based on the concept of Tanqia Mawade Raddiya (Evacuation of Morbid Matter), Tadeel-e-Mizaj (Rejuvenation of Temperament), and Taqwiat-e-Asab (Strengthening of Nerves)5,8,16.

**Tanqia (Evacuation):**

The first line of treatment in the management of Falij is Tanqia which literally means ‘getting rid of’ or to ‘clean up’ Akhlat-e-Raddiya (Morbid Humours) by the process of Nuzj (Concoction) and Istifragh (Elimination)5,7.

**Nuzj (Concoction):**

Nuzj is a process of modification in the viscosity of Akhlat-e-raddiya in order to make them suitable for evacuation conveniently from their sites of lodgment and diseased organ. For this, drugs having properties like Taheel (dissolution), Taeqie (disintegration) and Taeleef (attenuation) are generally used and termed as Mushilat, Muqatte and Mulattif, respectively. Mushilat may be defined as the drugs which act on ghalez Khilt (viscid humour) to make it dissoluble and detachable from its site of pathology. Mulattif are those drugs which interact with Qwat-e-tabiya of the body to divide the morbid matter into smaller parts. Muqatte are the drugs which penetrate into the interstitial spaces of the organs due to their lightness and remove the adhered khilt from the organ. Drugs possessing all these properties are known as Munzijat (Concoctive)5,7,19.

**Munzijat (Concoctive):**

Munzijat is a group of drugs which appropriately alters the consistency of morbid Akhlat to render them easily eliminable from the diseased organ. These drugs work either by liquefying the ghalez akhlat, or thickening the raqqeq akhlat. They are classified as Munzij-e-balgham, Munzij-e-safra, and Munzij-e-sauda. These drugs enhance the process of recovery and healing in the injured and inflamed tissues by their anti-inflammatory, analgesic, antioxidant and antiseptic properties. They streamline and bring about desired changes in the inflammatory fluid of the injured tissues and promote normal and enhanced healing pattern in them. Enhanced normal pattern of healing by various vascular and cellular changes in injured tissues by active constituents of Munzij drugs may be termed as Nuzj in Unani medicine. The ingredients of Munzij-e-Balgham formulation are as follows: Aslusoos (Glycyrriza glabra Linn), Ustukhuddus (Lavendula stoechas Linn), Beikh-e-Kasni (Cichorium intybus Linn), Beikh-e-Karafs (Apium graveolens Linn), Gauzanban (Borago officinalis Linn), Inabussalal (Solanum nigrum Linn), Beikh-e-Kibir (Capparis spinosa Linn), Badyan (Foeniculum vulgare Mill), Anjeer (Ficus carica Linn), Maweez Munaaqq (Vitis vinifera Linn)7,19.

**Istifragh (Evacuation):**

Istifragh is the process of evacuation of Akhlat-e-Raddiya. Once, the akhlat-e-raddiya mature for evacuation from the affected organs after a course of Munzijat therapy, purgatives (Mushilat) are employed into work. These drugs are believed to assist the elimination of concocted material out of the body7.

**Mushilat (Purgatives):**

Mushil drugs have characteristics to rid the morbid Akhlat out from the diseased organ, concerned vessels, neighboring structures and from whole body through intestine by process of purgation. According to their tendency of affinity with different Akhlat, they are named as Mushil-e-Balgham, Mushil-e-Safra and Mushil-e-Sauda7. Mushilat, though do not appear to have apparent relation with the cleansing of the brain tissue especially when the Munzijat have already done the dissolution action on the viscid humours, the purgative action; however, seems to have a bearing on the healing and recovery process of the injured brain tissues in two possible ways; firstly, the drugs used for purgation may have a cleansing effect on the brain tissues by further lysis and dissolution of clogging material in the arteries and secondly enhance the absorption of inflammatory exudates in to the venules to cleanse the injured tissues as the heavy purgation may change the osmotic properties of the intravascular compartment and facilitate absorption of relatively less concentrated fluid around the injured brain tissue into the surrounding vessels to render it favourably less oedematous and contracted in size, to ultimately decrease the intracranial pressure and promote the healing. The ingredients of Mushil-e-Balgham formulation are as follows; Ustukhuddus (Lavendula stoechas Linn), Barg Sana (Cassia angustifolia Vahl), Turbudd (Ipomoea turpethum Linn), Maghz Faloos Khyarshambar (Cassia fistula Linn), Roghan-e-Zard (Ghee)7,19.

**Tadeel (Rejuvenation):**

The next step in the management of Falij is Tadeel-e-Mizaj which means temperamental normalization of involved...
organs after the process of purgation. For restoration of Mizaj-e-Tabai (Normal Temperament), single or compound drugs having Haar Mizaj are recommended as per the principle of Ilaj-biz-Zid (Hetero-therapy). Apart from oral medications, certain regimensal modalities are also recommended for the rejuvenation of the affected organ such as Dalk (magnify), Hijama (dry/wet cupping), Aabban (Sitz-bath), Shamoorn (aromatherapy), Tila (liniment), Gargarah (gargle), Takmeed (fomentation), Fasd (vesection), Huqna (enema), Hammam (Turkish Bath). Tadeel is one of the most distinguished features of principles of Unani treatment. Any existential substance in the universe remains in its naturally healthy state as long as it maintains Mizaj-e-Tabai (normal temperament) and continues to function and plays its role in the hierarchy of universe. The disintegration of Mizaj-e-Tabai leads to depreciation, loss or abnormally altered function of a body. Tadeel refers to regaining structural integrity and function of the cells and tissues in an organ. There are various methods to replenish and reinvigorate the function of an organ after its initial recovery from the injury. After a course of Munajj and Mushil, the course of Tadeel begins by employing various treatment modalities used for a range of attending complication of Falij.7,8,13,15

The best considered regimenal modality for Falij is Riyazat (Exercise) and diet restrictions. This arrangement dissolves the thick phlegm and produces yellow bile in the body, beneficial for paralyzed patients. Riyazat is advised to maintain the tone of the muscles. The type of Riyazat depends on the site of affected muscles; thus, Riyazate Mutarakhiya (Exercise with weak and slow movements) is appropriate for facial palsy; Riyazate Motadil (average strenuous exercise) for upper limbs paralysis and Riyazate Hasheesha (fast and strenuous exercise) for lower limbs paralysis.20

DISCUSSION:

Tanqia and Tadeel represent complete package of treatment for the patients of stroke. It is evident that approximately 85 percent of strokes are ischemic in nature, produced by athero-thrombo-embolic phenomenon. The occluded artery thus produces a wedge-shaped infarct zone in its area of blood supply, surrounded by ischemic and dysfunctional zone, known as penumbra. The main aim of the treatment in modern medicine is to salvage the penumbra which remains viable for few hours depending on several coexisting and comorbid factors. Early and aggressive treatment with thrombolytics and antithrombotics within the golden hours salvages the ischemic penumbra by dissolving the occluding thrombus and recalanizing the artery, while accruing delay in the treatment proportionately increases the magnitude of damage of penumbra, thereby increasing the infarct size and atteding complications in the form of more residual disabilities and delayed rehabilitation. This phase takes several weeks to a few months and is characterized by rapid recovery due to recalanization, establishment of collateral flow and reduction in inflammation in infarct zone.21-24. This may be considered the first phase of recovery in patients of stroke. This phase of recovery is exerted by Munajj and Mushil drugs, which together form Tanqia (evacuation and cleansing), the first phase of the treatment of stroke in Unani medicine. The drugs prescribed in formulon of Munajj are endowed with properties such as Tableel (dissolution), Taqjee (disintegration) and Talteef (attenuation) which fairly resemble the thrombolytics, antithrombotic and neuroprotective agents of modern medicine in their actions, aimed to dissolve the occluding thrombus. From the Unani perspective, these drugs are Muhalil (Resolvent), Mulattif (Demulcent), Muncaffie Dimag (Brain Cleanser), Mujafteh Suddad (Deobstuent), Muhallile Auram (Ant-inflammatory) and Jali (Cleanser) which tend to open the obstruction and re-canalis the vessels; reduce the inflammatory reaction and edema; scale down the damage of ischemic penumbra, and ultimately limiting the neuronal damage, thereby, helping in rapid recovery in first few weeks of stroke.

After the elimination of abnormal phlegm represented by Sudda (thrombus), the nervous structures become receptive to regain lost vigor, vitality and normal functions, which are achieved by using various drugs and regimenal procedures and this phase of recuperation and rejuvenation is known as Tadeel.7,16-17 This phase is marked by slow recovery which continues from weeks to months, even years. The first phase was characterised by dissolution of thrombus, recalanization and reduction in brain edema, the second phase is known for tardy recovery caused by certain characteristic structural and chemical changes in brain tissue known as neuroplasticity. Neuroplasticity has been defined as the ability of the brain to change and repair itself. The mechanisms of neuroplasticity essentially comprise neurochemical, neuroanatomical and neuroreceptive changes. Tropic molecule such as nerve growth factor plays a key role in growth and repair of process. Sprouting of injured axons to innervate the previously innervated synapses is known as regenerative synaptogenesis (collateral sprouting). Improvement in neurotransmitter release and receptor sensitivity is termed as synaptic plasticity. Changes in synaptic strength, long term potentiation (LTP), firm up neuronal connections and serve as a basis for all memory and learning. Different and undertulized areas of the brain (e.g., cortical supplementary and association areas) can take over the functions of damaged tissue, a process called as vicariance. The unmasking of new, redundant neuronal pathways permits cortical map reorganization and maintenance of function. Whole different areas of the brain are also capable of becoming reprogrammed, a process termed as substitution.25 The whole changes in the structure of the brain as a recovery process after the stroke are considered to be brought about by Muqawwi-e-Dimag (Brain Tonic), Munajj-e-Dimag (Brain Cleanser), Muqawwi-e-Aasab (Nervine Tonic) properties of the drugs used under the rubric of Tadeeel.

The Unani herbal drugs used in the treatment of stroke are thought to bring about not only the recuperative changes in the brain tissues but also provide protection from noxious substances and chemical processes implicated in the damage of the nervous tissues due to ischemia, termed as neuroprotection.

Neuroprotection is a concept which lays out a treatment to prolong the brain's tolerance to ischemia.17,26. It also includes prevention of oxidative stress, mitochondrial dysfunction, inflammation, and apoptosis.17,27 Studies suggest that glyburid (a major flavonoid of Glycyrrhiza glabra) significantly decreases the focal ischemic volume, cerebral histological damage and apoptosis.28 Antioxidant29-30, anti-platelet and anti-inflammatory activities of Glycyrhiza glabra30,31 were also reported. Memory enhancing activity of G. glabra was also reported in a laboratory-based experimental trial.30,32 The neuroprotective activity of Ustukhuddus is reported against cerebral ischemia which is attributed to its anti-oxidant activity.33-34, Essential oil of Badyan (Foeniculum vulgare Linn) showed antithrombotic activity in prevention of induced paralysis.35 Badyan is supposed to be an excellent source of natural antioxidants which can inhibit free radicals
due to the presence of highly potent chemical constituents having antioxidant activity. Cicorium intybus is well known medicinal plant having phytochemicals throughout the plant but the main contents are present in the root which was described by Unani physicians thousands of years back as Beikh-e-Kasan. Antioxidant, analgesic and anti-inflammatory activities of Chicorium intybus were reported in various studies. It was also reported that chicory has anti-neurotoxic and neuroprotective activities. Antioxidant and anti-inflammatory activities of Apium graveolens L. are reported through various studies. Antioxidant and memory enhancement activities of Borago officinalis Linn were reported in animal models. Berg-e-gauzaban (leaves of borage) contains gamma-linolenic acid (GLA) which is prescribed as anti-inflammatory agent with the belief of having fewer side effects than other anti-inflammatory agents. GLA is also reported as having anti-thrombotic activity. Neurodegeneration is supposed to be potentiated with uncontrolled production of free radicals which can be controlled up to some extent with external antioxidants. Inabuthusalab (Solanum nigrum Linn) is reported to have significant antioxidant and anti-inflammatory activities. Anti-inflammatory action of Beikh-e-Kibr (Capparis spinosa Linn) has been proved in various reports. Root extract of Capparis spinosa is reported as having pain relieving activity. The therapeutic use of Anjeer (Ficus carica Linn) is mentioned in USM for a wide range of ailments. Anti-inflammatory, antioxidant and anti-platelet activities of Ficus carica were reported in various studies. Mawaeez Munaqua (Vitis vinifera Linn), also known as grapes, have been used since thousands of years for their medicinal as well as nutritional benefits. Antioxidant as well as anti-inflammatory activities of Vitis vinifera have been reported.

CONCLUSION:

Unani medicine has the potential to treat Falij as the classical literature of Unani medicine is highly enriched with centuries old experiences of eminent Unani physicians. Tadeel wa Tanajja, a unique concept, offers a comprehensive treatment package for stroke patients. The drugs used sequentially in the treatment of stroke under Tanajja and Tadeel comprise the requisite constituents, offering timely management of the developing pathology, augment healing, restrict damage, protect from further damage and rehabilitate the patients of stroke with least residual disability accompanied with little side effects and adverse reactions. With all the salutary and wholesome offers, the Unani treatment of stroke on the lines of Tanajja and Tadeel, alone or as an adjuvant may provide a breakthrough as an alternative or integrative approach to contemporary stroke management.

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