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Role of Dalk (Massage Therapy) as Neurorehabilitation in Post Stroke Hemiplegia (Falij Nisfi). A Review

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ABSTRACT:

Hemiplegia is defined as a condition in which one of the longitudinal halves of the body is paralysed, and either the motor or sensory functions are lost. *Falij* (Hemiplegia) impairs movement and sensation in the longitudinal half of the body because the penetration of *Roohe Hassas* and *Muharrik* (sensory and motor transmission of impulses) into the organs may either be stopped or the *Rooh* (pneuma) may penetrate but the organs may be unresponsive due to *Sue Mizaj-e-Aza* (Abnormal temperament of organs). Stroke incidence was estimated to be between 180 to 300 per 100,000 people, making it a significant cause of medical death. One or more disability is reported by up to 90% of survivors among those annually impacted. Stroke management has always been difficult for all medical systems. Modern medicine has made significant advancements in the treatment and control of both ischemic and haemorrhagic strokes in life-threatening situations, but not in the post-stroke hemiplegia management. Unani system of medicine have shown their great effect in the management of *Falij* and prevention from permanent disabilities through its renounced and emerging branch *ilaj-bit-tadbeer* (Regimenal Therapy). In *ilaj-bit-tadbeer* one of famous and effective regimen, *Dalk* (Massage Therapy) have shown efficacy in the management of past stroke hemiplegia. *Dalk* is used as rehabilitation in hemiplegia due ot its various mechanisms and effects on different systems of the body. *Dalk* liquefy *Rutubat-i-badan,* liquefy *Akhlat-i-fasida (*morbid humours), create *Latif Hararat* (Heat) in the body, and strengthen ligaments, tendons and muscles, increases the blood circulation in the affected part, relieves pain and stress, increase the atrophied muscles mass, and produces mechanical stimulus and reflexes in paralyzed muscles and hence improves the sensory and motor impairments. The information in this article will assist readers in understanding how *Dalk* affects paralysed muscles and how to use *Dalk* to improve the lives of hemiplegia patients and other paralyzed patients.

Keywords: *Falij; Dalk;* Neurorehabilitation

INTRODUCTION

Hemiplegia is defined as a condition in which one of the longitudinal halves of the body is paralysed, and either the motor or sensory functions are lost. Stroke is the most common cause of hemiplegia and is regarded as India's third leading cause of death and disability[1]. According to WHO, a stroke is characterised by rapidly emerging clinical signs of focal (at times global) impairment in cerebral functioning that lasts for more than 24 hours or results in death with no other obvious cause than vascular origin. Stroke incidence was estimated to be between 180 to 300 per 100,000 people, making it a significant cause of medical death. One or more disability is reported by up to 90% of survivors among those annually impacted[2]. A person with a brain damage, whether ischemic or haemorrhagic, is physically and socially constrained, which makes him depressed[1].

Falij is an Arabic word meaning "to halve". *Falij* was given this name because it divides the body into two halves, one healthy and the other diseased, while only affecting one half of the body and leaving the other unaffected (healthy)[3,4]. *Falij* impairs movement and sensation in the longitudinal half of the body because the penetration of *Roohe Hassas* and *Muharrik* (sensory and motor transmission of impulses) into the organs may either be stopped or the *Rooh* (pneuma) may penetrate but the organs may be unresponsive due to *Sue Mizaj-e-Aza* (Abnormal temperament of organs)[3,5]. In ancient Unani literature, *Istirkha* and *Falij* are described as being paralysed. *Istirkha*, a general term for the paralysis of any organ, is used by the *Falij* to refer especially to the *Istirkha* (paralysis) of the longitudinal half of the body, beginning either from head to toe or occasionally below the neck and sparing the head[3,5,6]. Since the Greco-Arabic era, it has been a well-known ailment, and Hippocrates, the father of medicine, was the first to describe it. Following Hippocrates, several Unani doctors such as Jalinoos/Galen (129-200AD), Rabban Tabri (770/780-850AD), Sabit Ibn Qurrah (836-903AD), Ali Ibn Abbas Majusi (930-994AD), and Ibn Sina detailed the disease's origin, pathophysiology, clinical characteristics, and treatment in their treatises. Tabri suggested that an obstruction in any section of the brain is what causes *Falij*[3,5,7].

AETIOLOGY OF *FALIJ*

Classical Unani literature gives two main explanations for the occurrence of *Falij*.

A. *Sudda* (obstruction): The obstruction stops the transmission of *Roohe Hassas* (sensory impulses) and *Roohe Muharrik* (motor impulses) to the targeted organs. This obstruction may be brought on by ligation, abnormal *Khilt-e-Balgham* accumulation, inflammation in the passage, and compression or contusion of nerves as a result of injury[3,6,8,9].

B. *Sue Mizaj-e-uzwi* (abnormal temperament of organ): The propagation and transmission of nerve impulses are normal, but due to abnormally excessive heat (*Hararat*), cold (*Barudat*), dryness (*Yabusat*), or moisture (*Ratubat*), the organ is still unable to respond to the impulses of *Roohe Hassasa* and *Muharrika* [3,6,8,9].

The majority of Unani medical professionals stated that *Khilt-e-Balgham* (Phlegm) and *Khilt-e-Dam* (Blood) are typically inequalities that lead to *Falij* [10,11].

RISK FACTORS

According to *Buqrat* (Hippocrates), individuals who frequently experience the flu and coryza are more likely to get *Falij*. According to *Jalinoos* (Galen), people with excess cold humours in their brains may experience *Falij* after being exposed to extreme heat and cold in a rapid manner.[12,13]. According to *Ibne Sina* (Avicenna), *Falij* is more common in the winter than the spring and affects persons around the age of 50 who live in southern areas because of the development of too much fluid in their heads as a result of a certain territorial temperament known as *Mizaj-e-Junubi* (Temperament of Southern Region)[5,14]. In this connection, *Azam Khan* also stated that those with cold dispositions, particularly the elderly, the weak, and those with abundant phlegm in their bodies, are more prone to developing this ailment. As other risk factors for Falij, he listed exposure to cold air and sufficient consumption of cold water. Apopexy, epilepsy, and hysteria are additional conditions that increase a person's risk of developing *Falij*, he added[8].

CLASSIFICATION

According to its causes, *Hakeem Azam Khan* divided *Falij* into the following categories.[8,15,16].

(a) *Falij-e- Balghami Ratubi* (due to excess of phlegm): This particular form of *Falij* is brought on by an "excess of phlegm." In this type there is Loss of movement and sensation which results when phlegm descends from the brain to the nerves and obstructing the *Roohe Hassas* and *Muharrik* passageways. This particular variety of *Falij* is distinguished by its abrupt onset and the presence of symptoms associated with an excess of phlegm.

(b) *Falij-e- Damwi* (due to quantitative imbalance in blood): This particular form of *Falij* is brought on by "excess blood." The onset is sudden, and there are signs of a blood surplus.

(c) *Falij-e- Intiqale Buhrani*: This particular kind of *Falij* results from the *buhran* in conditions like meningitis, apoplexy, epilepsy, colic, hysteria, and severe fever. Furthermore, the onset is sudden.

(d) *Falij-e- Warami* (due to inflammation): This kind of *Falij* is defined by a gradual onset and accompanying symptoms including fever, pain, or palpable nerve enlargement. The underlying cause is inflammation, whether it be hot, cold, gaseous, or hard.

(e) Falij-e- Wabayi: This particular form of *Falij*, which is thought to be brought on by "contaminated air," commonly affects the left side of the body and is characterised by symptoms including red eyes, halitosis, vomiting, unconsciousness followed by delirium, incontinence of pee and faeces, and rapid death within days.

Based on the parts affected, *Falij* may be of following types [6,8,11].

a. *Falij*: Paralysis of the longitudinal half of the body.

b. *Khala / Falij ma'a Laqwa*: Half of the body is paralysed, with either the ipsilateral or contralateral head and face being affected.

c. *Abu Bilqisya*: Paralysis of whole body except face. This type of paralysis is seen in cervical cord diseases.

d. *Sakta*: Total body paralysis, including facial and head paralysis. This could be the manifestation of a basilar hematoma stroke.

e. *Falij-e-Asfal / Falij-e-Atrafi*: This is a symptom of dorso-lumbar disc disorders and lower limb paralysis.

SIGNS AND SYMPTOMS

If the entire body is paralysed with the exception of the face, this is an indication that the first spinal vertebrae have been affected by *Madda-e-Marz* (the causative substance). If the entire body, including the face, is paralysed, it is likely that the brain is connected to the *Madda-e-Marz* (causative matter). Common symptoms in *Falij* include sudden, intense headaches, swelling in the neck vessels, blurred vision, cold extremities, clenching the teeth while sleeping, and difficulty moving.[17,18].

MANAGEMENT

Acute stroke management has received considerable attention and scrutiny, but when it comes to rehabilitation of survivors, conventional medicine has a limited approach and effectiveness; patients are referred for rehabilitation programmes like physiotherapy, which has a limited role to play. In unani system of medicine there are three core modes of treatment medicine such as *ilaj-bit-tadbeer* (regimenal-therapy) *wa ilaj-bil-ghiza (*diet therapy), *ilaj bi'l-dawa* (pharmacotherapy) and *ilaj bi'l-yad* (surgery)[19]. *Ilaj bit tadbeer* is defined as any favourable modification in *Asbab Sitta Zarooriya* (six essential factors) aimed at the treatment of disease. Numerous regimens are employed, including *Hammam* (Bathing), *Dalk* (Massage), *Takmeed* (Fomentation), *Hijamah* (Cupping), *Irsale-Alaq* (Leeching), *Fasd* (Venesection), *Ishaal* (Purgation), *Riyadat* (Exercise), *Qai* (Emesis), and *Idrare Baul* (Diuresis) etc [20]. These regimens are used separately or in conjunction with other forms of therapy. In *ilaj-bit-tadbeer Dalk* (Massage) is one the most beneficial and effective regimen (Therapy) for hemiplegia as a rehabilitation.

DALK (MASSAGE)

Unani physicians included *Dalk* in the category of *Riyadat* (Exercise), due to its ability to liquefy *Rutubat-i-badan*, liquefy *Akhlat-i-fasida (*morbid humours), create *Latif Hararat* (Heat) in the body, and strengthen ligaments, tendons and muscles like *Riyadat*. The purpose of this therapy is to improve blood circulation by rubbing the body's surface with hands.[21,22] *Ibn-Rushd* (1126-1198 AD) states that the *Dalk* technique is employed to remove the *fuzlah* of *hazme akheer/hazme uzwi* (waste metabolites of digestion). Additionally, it says that *Dalk* is a means of applying pressure to, rubbing against, vibrating against, or stimulating the soft exterior of the body with cloths or hands, with or without oils.[21,23] A massage is described by the American Massage Therapy Association (AMTA) as "manual soft tissue manipulation, holding, producing movement, and/or providing pressure to the body." [24] According to Sinha (2010), "any technique that imparts mechanical energy to the soft tissues of the body without producing any change in the position of joints in order to elicit certain physiological or psychological effect [that] can be utilised for therapeutic, restorative, or preventive purposes either on healthy or sick individual can be defined as massage".[25]

Role of *Dalk* (Massage) in hemiplegia as rehabilitation and why *Dalk* is used in hemiplegia;

Muscle protein breakdown (proteolysis) occurs in hemiplegia because the muscles are no longer stimulated to conduct work. when proteolysis exceeds protein synthesis muscle mass diminishes and is referred to as atrophy

of muscles. Increased proteolysis alters the composition of muscles, causing fat to accumulate and decalcification to occur.[26]

Dalk is effective in hemiplegia because of the following mechanisms and effects on various systems of the body;

MECHANISM OF ACTION OF *DALK* (MASSAGE)

According to *Unani* System of Medicine, the mechanism of action of massage is based on holistic approach, there are two fundamental concepts i.e., Evacuation of peccant matter (*Tanqiya-e Mawad Fasida)* and Diversion of morbid humours (*Imala-e Mawad Raddiya*). *Tanqiya-e-Mawad* is the process by which diseased fluids and surplus humours are resolved and expelled from the body, preserving the bodily humours' qualitative and quantitative equilibrium, which is necessary for the preservation of normal health. *Imala-e-Mawad* is the process of diverting the noxious humours and fluids from the damaged organs to the area where they can be quickly evacuated from the human tissues.[21,27,28]. In *unani* literature the main cause of hemiplegia is imbalance in humours and these mechanisms of Dalk helps to maintain the humours in the body.

The fundamental concepts that explain the effect of therapeutic massage can be divided into two general categories, i.e.

1. Mechanical effect: This effect happens when different kinds of mechanical force (tension, bending, shear torsion, and compression) are delivered directly to the body and directly affect the soft tissue through methods that normalise the connective tissue or transport bodily fluids and intestinal contents. Muscle tone is mostly affected by mechanical means.[29]

2. Reflexive effects: When different mechanical stresses are applied to body tissue during a massage with the goal of igniting the neurological system, the endocrine system, and the body's chemical processes, this result happens. A reflex is an uncontrollable reaction to a stimulus, and a massage may be that stimulus.[29]

EFFECTS ON VENOUS AND LYMPHATIC FLOW [28,30]

Massage's mechanical action is similar to that of a typical muscular contraction. The soft tissue is alternately compressed and released by the various massage techniques. This makes the lymphatic and venous flow easier. The effleurage, kneading, and petrissage stretch the lymphatic arteries and veins, pushing venous blood and lymph toward the heart, increasing the amount of blood and lymph draining from the massaged region or segment. The lymphatic and vein systems are mechanically emptied with the help of massage. It lessens the possibility of venous blood and lymph stagnating in the tissue area by facilitating the flow of those fluids ahead.

EFFECTS ON THE ARTERIAL FLOW [28,30]

The area being massaged benefits from better blood flow. After a massage, one can typically notice a noticeable vasodilation as well as an increase in peripheral blood flow. The following things can happen during a massage that cause a moderate, steady increase in artery flow that is clearly discernible: the release of vasodilators (such as histamine), the activation of the axon reflex (which results in cutaneous vasodilation), and the reduction of venous congestion.

EFFECTS ON THE EXCHANGE OF METABOLITES AND METABOLISM [28,30]

Massage encourages the swift elimination of waste products, the replenishment of nutritional elements, and also speeds up the passage of liquids and gases within the body.

EFFECTS ON THE SOFT TISSUE, ADIPOSE TISSUE AND SKIN [28,30]

By releasing soft tissue adhesions and promoting maximum mobility between fibres and nearby structures, massage has a significant impact on soft tissue properties like elasticity, plasticity, and mobility in muscles, sheath, ligaments, tendons, aponeurosis, joint capsules, and superficial and deep fascia.

EFFECTS ON NERVOUS SYSTEM [28,30]

Different massage techniques have an impact on the sensory, motor, and autonomic components. Different massage techniques, depending on their pace of application and level of pressure, can result in facilitating and inhibitory effects on neuromuscular excitability. By activating skin receptors or extending the muscle spindle, it can improve muscle tone; yet, it can also decrease muscle tone by inhibiting motor neuron activity. In rare cases of spasticity, a deep, rhythmic massage that applies pressure over the muscle insertion has been shown to be beneficial. By regulating the autonomic nervous system's sympathetic and parasympathetic components, connective tissue massage increases the blood flow to the target organ.

TYPE OF *DALK* AND OILS ADVISED IN *HEMIPLEGIA*[31]:

Dalk-i-Sulb Kathir (Hard massage for prolonged duration), *Dalak Layyin* [34] (Gentle Massage)with *Roghan-e-qust, nardeen, kaknaj, badam, balsan* with *jundbedastar, farfiyoon.* For ***Istirkhaa* (flaccidity):** Apply *Roghan-e-istirkha*[17], *Roghan-e-darchini* over affected part. [8,32] For ***Khadar* (Numbness):** Massage the affected part with *Roghan-e-farfiyun/qust* mixed with *jund bedastar* and *aqarqarha*. [8]

SCIENTIFIC REPORTS

Yasir et al. conducted a study entitled, "Evaluation of Efficacy of Unani Regimen in the Management of Post Stroke Spasticity, an Open Observational Study", the clinical trial shows that *munzij wa mushil-e-balgham* and massage with *roghan-e-malkangini* is effective in post stroke spasticity by reducing spasticity predominantly antigravity muscles. [33]

Ahmed A. et al. conducted a study entitled, "Efficacy of *munzij wa mushil-e-balgham* (poly herbal formulations) and massage with *roghan-e-malkangani* in *falij nisfi* (hemiplegia): a randomised controlled clinical trial". *Dalk Layyan* (massage) was started using 20 ml of warm *Roghan-e-malkangani* on the spinal column and affected limb for 15 minutes, once a day, for a period of 2 weeks and assessed on Stroke Rehabilitation Assessment of Movement (STREAM) which shows significant improvement in STREAM scores for voluntary movements of upper limb, lower limb and basic mobility as compared to control. [34]

Amanullah H et al. conducted a study entitled "to evaluate the efficacy of massage with *Roghan Seer* in motor recovery in hemiplegia secondary to ischemic stroke". They reported that the massage with test drug has significant improvement in voluntary movements and basic mobility of the lower limb. [35]

Zarnigar et al. conducted a study entitled, "Role of *Dalak* and *Riyazat* in the rehabilitation of patients with post stroke hemiplegia", the results of Dalak showed significant effect in improvement of Fugl Meyer upper limb score. [36]

CONCLUSION

Falij is a major source of morbidity and disability in the modern day, and the burden of paralysed people on the community is growing daily. Dalk has been suggested for the treatment of Falij in the Unani system of medicine for a very long time. A variety of mechanical stimuli and reflexes are produced during massage therapy, and when paralysed muscles respond to these stimuli and reflexes and also increased blood circulation of the paralysed part with removal of morbid humours during massage, they start functioning normally, the disability slowly diminishes over time. Which qualifies *Dalk* as an effective and successful rehabilitation regime strategy for post stroke hemiplegia with minimal side effects and financial strain. Keeping in mind the benefits of *Dalk* and how it affects the paralyzed muscles, modifications and development of advance therapeutic techniques are still the need of hour. With all the beneficial and healthful benefits, the *ilaj-bit-tadbeer* (Regimenal therapy) management of stroke on the lines of *Dalk* alone or as an adjuvant may provide a breakthrough as a substitute for or integrative approach to modern stroke management.

The advanced techniques in the *Dalk* so developed, should be practiced regularly to make *Falij* patients more independent in their lives, so that they can lead a physical, social, mental and vocational stable life.

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