



**TAKMĪD (FOMENTATION)-AN EFFECTIVE TREATMENT COMPONENT OF 'ILĀJ
BI'L TADBĪR (REGIMENAL THERAPY) IN UNANI MEDICINE FOR VARIOUS
AILMENTS**

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ABSTRACT

'Ilāj bi'l Tadbīr (Regimenal Therapy) is one of the treatment modules of Unani system of medicine in which the cure of a sick person and general health is achieved by Tanqiya (elimination), Imāla (diverting of morbid humors) and by enhancing the defense mechanism of the body through performing certain procedures of 'Ilāj bi'l Tadbīr (IBT). Ibn Sina, a worldwide fame physician of 10th century has discussed various non pharmacological procedures under regimenal therapy including Takmīd (Fomentation). Takmīd is a simple, noble non pharmacological effective mode of treatment described in Unani system of medicine to relieve pain, subsides the inflammatory conditions and to disperse gaseous collection and evacuation of Mawād-i-Fāsida (morbid materials) from the affected parts. Heat of hot fomentation also enhances the local absorption of medicines thus helps in getting the desired action of medicine locally. It results in desired neurological and pharmacological effects in various diseases. Cold fomentation produces vasoconstriction that helps in reducing inflammation. Takmīd is specifically effective in the management of neurological and inflammatory conditions like headache, backache, cystitis, mastitis, arthritis, epilepsy, renal colic, gastritis, dysmenorrhoea, etc. This paper aims to highlight the information on Takmīd, benefits and uses of Takmīd therapy in light of classical Unani literature and try to explore the scientific basis of mechanism of effects produced by Takmīd (fomentation).

KEYWORDS: Unani medicine, Takmīd, Fomentation, Regimenal therapy, 'Ilāj bi'l Tadbīr.

INTRODUCTION

Unani System of medicine is one of the oldest healthcare systems serving the mankind since antiquity and is practiced in a well developed form. The theoretical framework of this system of medicine is based on teachings of Hippocrates, who laid emphasis over observation, experience and rational principles, which still hold valid in the field of medicine. In this system, maintaining health and avoiding disease is promoted by understanding the *Mizāj* (temperament), following principles of living, eating and feeding and medicating properly. The management of diseases depends upon the pathology involved in the disease process.^[1] Four methods of treatment for management of ailments are described in Unani medicine advocated on the principles of treatment i.e. *T'adīl-i-Mizāj* (normalization of temperament), *Tanqiya* (evacuation of morbid material), *Imāla* (diversion of morbid material) and removal of causative factor. These four treatment modules are *Ilāj*

bil Ghiza (dietotherapy), *'Ilāj bi'l Tadbīr* (Regimenal Therapy), *'Ilāj bi'l Dawa* (Pharmacotherapy) and *'Ilāj bi'l Yad* (Surgery). Unani physicians advised to begin the treatment with first two therapies.^[2] *Ilāj bi'l Tadbīr* (IBT) is composed of two words *Tadbīr* and *'Ilāj*. Literally *Tadbīr* is an Arabic word means 'Regimen' while *'Ilāj* means 'treatment'. Therefore *'Ilāj bi'l Tadbīr* (Regimenal Therapy) is a treatment module in which the cure of a sick person and general health is achieved by *Tanqiya* (elimination) or *Imāla* (diverting) of morbid humors or by *Ilām* (counter irritant) through performing certain non-medicinal procedures.^[1,2] These non-medicinal procedures are known as components of *'Ilāj bi'l Tadbīr* (IBT). Ibn Sina, a worldwide fame Unani physician of 10th century has discussed various components of regimenal therapy such as *Faşd* (venesection), *Irsāl-i-'Alaq* (leeching), *Hijāmah* (cupping), *Dalak* (massage), *Nutūl* (irrigation), *Qay* (Emesis), *Idrār-i-Bawl* (Diuresis), *T'arīq* (Diaphoresis),

Munzij wa Mushil (concoction and purgation therapy), *Bukhūr* (medicated steam), *Kayy* (cauterization), *Huqna* (enema), *Takmīd/Kimād* (fomentation), etc.^[3] If patient is having *Sū-i-Mizāj* (derangement of temperament)-life style modifications, diet, sleep, physical exercise, *Dalak* (Massage), *Hammām* (turkish bath) is done. In patients having *Amrāz-i-Sū-i-Tarkīb* (structural diseases), *Faṣḍ* (Venesection), *T'alīq* (Leeching), *Hijāmah* (Cupping), *Qay* (emesis), *T'arīq* (Diaphoresis), *Mushil* (Purgative), *Mudir* (Diuretic) and *Takmīd* (Fomentation) is given.^[4,5] Unani scholars were well acquainted with the effects of heat and cold on the body and mentioned its use in form of *Takmīd* (Fomentation). It is a major used procedure of '*Ilāj bi'l Tadbīr*' to relieve pain and inflammation. So a need is felt to explore the mechanism of action of *Takmīd* in relation to contemporary science. Unani terminologies are mentioned in Italics words with diacriticals for their English transliteration and proper pronunciation.

MATERIAL AND METHODS

A comprehensive study was undertaken on the description of *Takmīd* (fomentation) therapy found in the Unani classical literature. Descriptions were collected from different Unani classics and research papers published in scholarly journals were searched online from scientific electronic databases viz. Pubmed, Google scholar by using the key phase: fomentation, *Takmeed*, *Ilāj bil Tadbeer*, Regimenal Therapy, pain, thermotherapy and cold therapy. Results were analyzed in view of contemporary science to understand the physiological basis of *Takmīd* and its application.

REVIEW AND DISCUSSION

The word *Takmīd* is used for fomentation. The word '*Kimād*' is a synonym of *Takmīd* and also used for fomentation.^[6,7]

Takmīd/Kimād (Fomentation) refers to a particular treatment method of '*Ilāj bi'l Tadbīr*' (Regimenal therapy) where heat or cold is provided externally to the body surface for therapeutic purpose. It is done to reduce the pain and stiffness in the organs of the body and to reduce swellings or inflammation.^[8, 9, 43]

Fomentation is done by either dipping the cloth in hot or cold plain /medicated water, squeezed and used for fomentation or by using ice packs. Sometimes, drugs or powder of drugs is tied in a piece of cloth/bag and used for local application after heating the poultice. The main objective of fomentation is to get relief from pain like renal colic, neuralgic pain, to reduce inflammation of the organs like arthritis, chest congestion, gastritis, and to disperse the accumulated gaseous matter from the organs in diseases like flatulence, gaseous pain, joints pain of gaseous type, etc.^[2,3] *Takmīd* stimulates or sedates the body surface depending on the temperature applied.^[10] Using cold or heat as a therapeutic intervention is to alter skin temperature over time for the purpose of inducing a desired biological response i.e. to reduce pain and swelling, to improve tissue metabolism,

increases/reduces blood circulation and sweating, and connective tissue extensibility. *Takmīd* (Fomentation therapy) alone or in combination is in use from the ancient time. *Buqrāt* (Hippocrates- d.460 BC), in his book '*Ebizīmiya*' recommended the application of the hot water filled caps made of clay or metal for the pain in the costal joints, and to place a soft material between skin and cap to prevent the burns. In addition, he also mentioned the dry heat application that consisted of a heated corn kept in the blanket made of wool for the management of pain associated with arthritis.^[11] Rāzī, in his book *Al-Hāwī fi'l Tibb* recommended *Hijāma* (Cupping) and *Takmīd Hār* (Hot fomentation) in the general principles of treatment of pain due to gaseous matter like gastralgia.^[10] Decoction prepared with various drugs having pharmacological actions such as *Muḥallil-i-Waram* (Anti-Inflammatory), *Musakkin* (Analgesic), *Muḥallil* (Resolvent), *Mulaṭṭif* (demulcent), *Kāsir-i-Riyaḥ* (Anti-flatulent), *Mubarrid* (Refrigerant), etc are used for fomentation or such drugs tied in a cloth are used in form of poultice for fomentation.^[10,12,43] Ibn Sīnā has also advised to do hot dry fomentation with the hot water filled in animal bladder (used as a bag).^[3] Sometimes, in this therapy, coldness is produced on the body surface such as in the initial stage of inflammation to repel the collection of matter at the site of acute injury or swelling. It is done by application of ice packs, oil chilled with cold water or ice cubes, etc. *Takmīd* (Fomentation) is dangerous or shows harmful effects if it is done in severe *Imtala* (Congestion) caused by retention of morbid humours.^[10]

Types of *Takmīd* (Fomentation)

I. *Takmīd* is basically categorized into 2 types depending upon the nature of fomentation^[8,10,13,14]

***Takmīd Hār* (Hot fomentation):** In this type of *Takmīd* (Fomentation), heat is given to the body surface. Warmth is provided by simply warming a cloth with heated object or cloth/towel is folded, dipped in hot plain/medicated water, squeezed and is applied over the proposed site of the body surface.^[8,14] This type of fomentation is beneficial in chronic injuries and after exercise to reduce any residual swelling. A foment is usually made of blanket material: 50% wool to retain heat and 50% cotton to retain moisture and be more durable.^[8] There are various ways to do hot fomentation depending upon the site. Rāzī quoted with reference to the book *Ebizīmiya* that for hot fomentation on eyes, sponge is used; for hot fomentation on musculoskeletal tissues like hip, back and joints, poultice (drugs tied in a cloth), animal bladder as hot water bags, or moist fomentation with a cloth dipped in medicated water is recommended. Hot fomentation on abdomen and over the head is also done with lukewarm oils application. Moist fomentation with plain warm or medicated warm water is used for extremities.^[10]

***Takmīd Bārid* (Cold fomentation)^[8,10,14,11]**

In this method, ice pack or chilled oil or distillate is directly applied over the affected site or towel is dipped

in the cold water, squeezed and then applied over the proposed site of the body surface with the objective to produce *Burūdat* (cold).^[8] Other things that can be used as cold foment are ice packs, ice towels, ice massage, gel packs, refrigerant gases and inflatable splints. It is more suitable in acute injuries (traumatic incidents for example a fall, twisting movement or direct blow and are immediately painful) and bleeding wounds. Ice should be applied as soon as possible in order to cool the tissues, reduces tissue metabolic rate and nerve conduction velocity and cause vasoconstriction of the surrounding blood vessels. Ice should remain in contact for up to few minutes at a time depending on the size of the area being treated and the depth of the injured tissues. Cold fomentation is one of the ways used to reduce pain by changing the temperature of the pain site.^[43]

Further, hot and cold fomentation may be divided as^[8,10,14]

Takmīd Yābis (Dry fomentation): In this type of fomentation dry heat or cold is provided to the body surface. It is done by hot water bags or by heating the poultice of drugs or by application of hot dry towels on the body surface. *Takmīd Yābis* (Dry fomentation) is beneficial in gaseous pain and *Waram-i-Rikhw* (soft swellings due to gaseous matter or liquefied phlegm).

Takmīd Raḥb (Wet fomentation): In this type of fomentation moist heat or cold is provided to the body surface. It is done by dipping the towel in the hot or cold medicated water. It is recommended in case of swelling caused by less viscous matter such as *Awram-i-Damviya* (Sanguineous type of inflammation) and *Waram-i-Ṣafrāvi* (Bilious inflammation).

In modern medicine heat and cold therapies are also done in two ways: dry and wet. Dry and wet application for fomentation has advantage and disadvantages.^[10, 15,16]

Wet application prevents drying of the skin and softens the wound exudates. Wet compresses are suitable for many part of the body. Wet heat applications affect the deep tissues. It does not increase the perspiration and there is no excessive fluid loss. Quick cooling appears due to the evaporation in wet heat applications. Burn risk is high because moisture transmits the temperature in wet heat applications. Dry heat increases fluid loss by perspiration. Dry application is not effective in deep tissues. Dry heat can cause drying of the skin.

Excessive dry and wet *Burūdat* (coldness) causes tissue damage and Hippocrates advised to do the cold fomentation cautiously.

II. Classification of *Takmīd* (Fomentation) on the basis of duration of application of heat or Cold^[3,8,9,10]

Takmīd Qawī (Strong fomentation): In this type of fomentation heat or cold is applied for a long duration. It is done with the intention to liquefy the viscous matter for easy evacuation of the morbid matter. Dry

fomentation is an example of this type of fomentation. In this fomentation drugs are used in form of poultice. For example *Karasna* (*Pisum sativum* Linn.) half crushed is cooked with vinegar diluted with small quantity of water, and dried. Then this dry material tied in a poultice, or prepared as a cake, heated and used for hot fomentation to resolve and disperse the matter causing inflammation and pain. Other foments that can be used as strong fomentation is *Namak* (Salt), *Bājra* (*Pennissetum glaucum* R. Br.), millet, etc. It is also done by placing a heated cloth /towel.

Takmīd Da'if (Mild fomentation): In this type of fomentation mild heat is applied for short duration. It is done when the morbid matter is irritant but not very viscous like bile. Moist fomentation is an example of this type of fomentation.^[3,10]

Physiological effects of *Takmīd* (Fomentation)

Heat of Takmīd Hār (Hot Fomentation) produces vasodilatation, temperature sensitive nerve endings send impulse to hypothalamus and make the centre aware about the local temperature changes, increases permeability of the capillaries, increase blood circulation at that site and also improves metabolism. It enhances blood supply to the skin and helps in relieving internal congestion.^[14,17] It relieves muscular pain and spasm viz. increasing circulation and releasing tension in the muscles.^[10] Increase of temperature stimulates vasodilatation and blood circulation in local tissue hence increases the supply of nutrients and oxygen to the site^[8,34] and accelerates tissue healing by means of increased capillary permeability. The rate of *Istehāla* (Metabolism) and sensitization of nerve ending also increased by the *Harārat* (Heat) which diverts the *Tabiyyat Mudabbira-i-Badan* (Medicatrix naturae) to work on healing of that tissue.^[8,34] Heat also causes change in the elasticity of collagen tissue and reduces synovial fluid viscosity which can be demonstrated by improvement of range of joint movement. It also promotes diversion of more white blood cells due to vasodilatation. It helps in elimination of toxins from the body by promoting sweating process.^[8,11] Physiological effects of heat therapy include pain reduction, increase in blood flow, metabolism, and elasticity of connective tissues. Hot and moist fomentation is included in the measures that reduce pain viz. resolving and correction of *Sū-i-Mizāj Sāda* (simple temperamental dyscracia).^[10,43] Ibn Sīnā has mentioned in the treatment of fatigue caused by exercise to relax what has become tense and it is achieved by application of warm oil and prolonged stay in warm water.^[3] Hot and moist fomentation produces muscles relaxation and increases vital faculty of the inflamed organ.^[14] Effects of *Takmīd Bārid* (cold fomentation) are due to the reduction in temperature in the various tissues, together with the neuromuscular action and relaxation of the muscles produced by the application of cold.^[8,19]

By providing the *Burūdat* (coldness) or decreasing the temperature of skin the blood circulation at the site of application decreases due to vasoconstriction, piloerection and shivering.^[8] Hence *Takmīd Bārid* decreases blood flow to the injured area, edema formation is prevented and thus inflammation reduces.^[8] Threshold of pain receptors and the conduction velocity of nerve signals is also reduced by *Burūdat* which help in induction of local anesthetic effect and helps in reduction of localized pain at the site.^[10] Locally, temperature sensitive nerve endings send signals to hypothalamus and make the brain aware of local decrease in temperature. It decreases capillaries permeability and refill and decreases metabolism. The tissue metabolism decreases due to cold which also reduces the oxygen requirement of the tissue. The decreased metabolic rate limits further injury and aids the tissue in healing that occurs after injury. Temperature of 30°C or lower at joint, inhibits the activity of cartilage degrading enzymes, including collagenase, elastase, hyaluronidase, and protease. Cold in the local area increases viscosity of blood which facilitates blood coagulation at the site of injury and checks bleeding.^[11] *Burūdat* (cold) also causes inhibition of spinal cord reflex loop which help in reduction of muscular spasm. Traditionally, ice is used in the treatment of musculoskeletal injury while cold water emersion is used for recovery from exercise.^[20] *Burūdat* (Cold) of *Takmīd Bārid* (cold fomentation) decreases blood flow, reduces inflammation and relieves pain by producing numbness, relaxes muscles and inhibits bacterial or microbial growth.^[16,19] According to Razi, pain reduces through cold fomentation (ice and chilled water) by producing *Burūdat* (change in temperature) and local *Takhdir* (anesthesia).^[10] Cold fomentation is helpful in reduction of pain which is due to *Sū-i-Mizāj Ghayr Māddī* (Simple non humoral morbid temperament) such as *Suda Shamsi* (Headache caused by prolonged exposure to sunlight in summer)^[10] and is beneficial in the management of acute trauma, acute pains, muscular spasm, and in prevention of inflammation.^[10] The duration of ice application should be for short period.

Procedure of *Takmīd* (fomentation)^[10, 14]

Apply fomentation to the area which needs to be fomented.

Use the intensity of heat or cold as indicated by patient's condition and to desired effect.

Foment a large area to relieve congestion.

Protect sensitive parts from fomentation.

Hot Fomentation Therapy is given for few minutes by application of hot water bottles, a warm damp towel, heat rub or commercially available heat pads. Ensure a suitable layer of protection is placed over the skin to prevent burn.

After the last fomentation, dry the body part thoroughly. The duration of very cold fomentation should be for short period as excessive *Burūdat* (cold) may causes

damage to that organ due to impairment of blood circulation.

Indications of *Takmīd* (fomentation):

As per Unani classics, *Takmīd* (Fomentation) is advisable and useful alone or as an adjuvant therapy in the treatment of the following diseases:^[13, 21-42]

Sarsām (Meningitis): *Takmīd Bārid* (Cold fomentation) over the head or forehead is advised^[21] to reduce the body temperature.

Ḍarbat al-Shams (Sun Stroke): *Takmīd Bārid* (Cold fomentation) is advised.^[25] It is done on the scalp and chest with a muslin cloth soaked in 'Araq-i-Gulāb (Rose water) 1 part, Roghan-i Gul ½ part, and *Sirka* (vinegar) 1 part. Mixture is chilled and superadded with *Ṣandal* (Santalum album Linn.).^[13,22,23,24]

Ṣudā' ***Shamsī*** (Headache due to heat): *Takmīd Bārid* (Cold fomentation) by application of *Roghan Kadu*, *Roghan Banafsha* and *Roghan Nīlofar* after cooling with ice, over the head.^[25,26]

Laqwa (Bell's palsy): *Takmīd Murkhī* (Moist fomentation to remove spasm). In case of *Laqwa Tashannujī*, *Takmīd Hār* (Hot fomentation) with cotton cloth dipped in hot water is advised.^[27] or hot fomentation with any membranous bag filled with suitable hot oil is done.^[27,28]

Khadar (Numbness): *Takmīd Hār* (Hot fomentation)^[13,28]

Ri'sha (Tremor): *Takmīd Hār* (Hot fomentation)^[13,21, 23, 25]

Sar'(Epilepsy): *Takmīd Hār* (Hot fomentation)^[42]

Ramad (Conjunctivitis): *Takmīd Bārid* (Cold fomentation)^[26,28] or *Takmīd Hār* (Cold fomentation) with decoction of *Post Khashkhāsh* (rind of *Papaver somniferum* Linn.).^[21,42]

Sulāq/ Bāminī (Blepharitis): *Takmīd Hār* (hot fomentation with hot water on eyes).^[21,27,28]

Sha'tra (Stye): *Takmīd Hār* (Hot fomentation) either dry or wet, on eyes.^[26, 29,42]

Waja al-Unq (Cervical pain): *Takmīd Hār* (Hot fomentation) on neck region.^[9,17]

Nazla (Catarrh): *Takmīd Hār* (Hot fomentation) in case of *Nazla Bārid*.^[22,28]

Zukām (Coryza): *Takmīd Hār Yabis* (Hot and dry fomentation) with *Jawar* (*Pennisetum typhoideum* Rich.) tied in cloth, in case of *Zukām Bārid*.^[27,28,41]

Su'āl (Cough): *Takmīd Hār* (Hot fomentation) on chest.^[23,30]

Ḍīq al-Nafas and ***Rabw*** (Bronchial Asthma): *Takmīd Hār Raṭb* (Moist and hot fomentation)^[30] ***Ḍhāt al-Janb*** (pleurisy): Hot fomentation with half baked *Rotī/Chappāti* (Bread).^[30]

Waram-i Sadī (Mastitis): *Takmīd Hār* (Hot fomentation) with hot water and *Khall al-Khamr* (Vinegar) in the initial stage of mastitis.^[25,26]

Barsam (Diaphragmitis): *Takmīd Hār* (Hot fomentation) with the half baked *Rotī/Chappāti* (Bread).^[30]

Waram-i-Meda (Gastritis): *Takmīd Hār* (Hot fomentation) is done to reduce pain associated with gastritis.^[21,31]

Waja al-Fuwad Balghami (epigastric pain due to phlegm): *Takmīd Hār Raṭb* (Moist and Hot fomentation).^[30]

Nafakh (Flatulence) or **Waja al-Meda Rihī** (Gastralgia due to flatulence): *Takmīd Hār Yābis* (Hot & Dry fomentation)^[28] with the drugs (*Namak Khurdanī* (Common salt), *Zīra* (*Carum carvi*, Linn.), *Ajwā'in* (*Trachyspermum ammi*, Linn.) tied in a cloth, after heating, over the epigastric region on ribs.^[13,30]

Waja' al-Kabid Rihī (Gaseous Hepatic pain): (*Takmīd Hār*) Hot fomentation.^[30]

Qūlanj (Intestinal colic): *Takmīd Hār* (Hot fomentation) is recommended in case of intestinal colic due to morbid phlegm or gaseous collection.^[30,42]

Zahūr (Dysentery): Moderate *Takmīd Hār* (Hot fomentation)^[23] or mild *Takmīd Hār Raṭb* (moist hot fomentation through *Ābzān* (Sitz bath)).^[28,32,42]

Waram-i-Miq'ad (Proctitis): *Takmīd Hār* (Hot fomentation).^[30]

Waja al-Kulya (Renal colic) associated with renal stone: *Takmīd Hār Raṭb* (Moist fomentation) through *Ābzān* (Sitz Bath) of lukewarm water²³ or *Takmīd Hār* (Hot fomentation) is advisable in case of renal pain due to kidney stone.^[28, 42]

Waram-i-Kulya wa Mathāna Bārid (Cold type of Nephritis and Cystitis): *Takmīd Hār* (Hot fomentation).^[42]

Bawl fi'l Firāsh (Nocturnal Enuresis): *Takmīd Hār* (Hot fomentation)^[23,28]

Waram-i-Rahim (Metritis/Endometritis): *Takmīd Hār* (Hot fomentation) over the pelvic region with *Nākhūna* (Pod of *Trigonellauncata*, Boiss.), *Bābūna* (*Matricaria chamomilla*, Linn.) and *Banafsha* (*Viola odorata* Linn.).^[23,28]

Waja' al-Mafāsīl (Arthritis): *Takmīd Hār Ḍa'if* (mild Hot fomentation).^[33] Dry fomentation is beneficial for *Waja' al-Mafāsīl Balghamī or Rihī* (arthritis due to phlegm or gaseous matter). It is given by rubbing hands on affected joint is also beneficial in Arthritis.^[28,33]

Waja' al-Zuhr (Backache): *Takmīd Hār* (Hot fomentation) helps to alleviate pain.^[33]

Humma (fever): *Takmīd Bārid* with cold water.^[34]

Ghashī (Fainting): *Takmīd Bārid* (Sprinkling of cold water).^[34]

Thakān (Fatigue): *Takmīd Hār* (Hot fomentation).^[3]

Drugs Used for fomentation

In Unani classical literature, drugs and herbal formulations are mentioned for *Takmīd* (Fomentation) based on their physical and pharmacological properties:

Icepacks, ice cubes, chilled water and various oils after cooling or mixing with chilled with cold water, are used for cold fomentation.^[10,21,28]

Hot water or lukewarm water: *Marāra* (bladder) of an animal filled with hot water is used for fomentation, as it is safe and gentle. It is done with proper precautions; otherwise it may prove dangerous [causes burns].^[10,34]

Post Khashkhāsh (fruit rind of *Papaver somniferum* Linn.): *Post Khashkhāsh* is boiled with *Araq Gulab*

(Rose distillate), filled hot in bottle or cloth soaked in hot decoction is used for fomentation.^[21]

Bābūna (*Matricaria chamomile* Linn.): Hot fomentation with the decoction prepared with *Gul-i-Bābūna* (flowers of *Matricaria chamomile* Linn.) and water, helps to resolve viscous phlegm, reduces chest congestion and is useful in dyspnoea.^[35]

Bājra /Jawras (*Pennissetum glaucum* R. Br.): Poultice prepared with *Bājra* grain is used for hot and dry fomentation in case of *Waja al-Meda* (gastralgia)^[36], *Waja' al-Uzn* (otalgia) and *Waja' al-Ayn* (pain in eyes).^[10] Hot fomentation with chappati prepared with *Bājra* flour on abdomen is beneficial for *Zahūr* (dysentery), *Bawāsīr* (haemorrhoides) and *Qulanj* (colic)^[35]. Razi advised to use *Bājra* (seeds) for dry fomentation as it produces more drying effects due to its dry temperament as well as it is safe and less harmful.^[10]

Sharāb (wine) is used for moist hot fomentation in case of *Waja' al-Meda* (gastralgia) due to *Sū-i- Mizāj Bārid* (cold temperamental dyscracia).^[36]

Sambhālū (*Vitex negundo* Linn.): *Barg-i-Sambhālū* (leaves of *Vitex negundo* Linn) are heated and applied over the head for fomentation to treat headache, over the abdomen in case of flatulence, and on chest for cough.^[37]

Shonīz (*Nigella sativa* Linn.): Hot fomentation with the nigella seeds poultice over the head is highly beneficial in coryza and over the other organs help in resolving gaseous collection.^[37]

Shab (Alum): Alum mixed with concentrated vinegar, is used for *Takmīd* (fomentation) in case of gastralgia due to melancholic matter and flatulence.^[36]

Tūdri (*Matthiola incana* R. Br.): Hot and dry fomentation with its seed in form of poultice over the chest is beneficial for chest congestion.^[38]

Farāsiyūn (*Marrubium vulgare* Linn.): Hot fomentation with the decoction prepared with its leaves, olive and water, is beneficial for *Amrāz-i-Riyāh* (diseases caused by gaseous collection), *Amraz-i-Tihal Riyahi* (Diseases of spleen due to gaseous matter), *'Usr al-Bawl* (dysuria) and other pains. Hot Fomentation on chest with decoction prepared with its leaves by means of dipping the cloth in it is beneficial for *Diq al-Nafas* (bronchial asthma).^[39]

Chirā'ita: (*Swertia chirata*): It is included in *Takmīd* (fomentation) formulations over pelvic region or its decoction used in form of sitzbath (for hot fomentation) to reduce pain and *Awram-i-Rehim* (uterine inflammation).^[40]

Karasana (*Pisum sativum* Linn.): Powdered peas cooked with vinegar and dried into a cake make a powerful foment.^[3,10]

Shibit (*Anethum sowa* Roxb.): Hot Fomentation with vapours of decoction of *Tukhm-i Shibit* (Seed of) for *Tahajjur-i-Mafāsīl* (Stiffness of joints).^[23, 25]

Namak (Salt): Salt-water fomentation is also used for moist hot fomentation or salt tied in a cloth can also be used effectively, as fomentation by salt produces heat in the vapours where as with millet seeds fomentation produces marked dispersion. It may also be given with warm oil.^[3] *Takmīd* (fomentation) can also be done to the

organs such as the eyes where it is given by application of just warming a piece of cloth.^[3,10]

Compound formulations of *Takmīd/ Kumad* (Fomentation) mentioned in Unani medical texts.

***Kimād* that produces penile hardness:**

The drugs *Sarshaf* (*Cyphomandra betacea* (Cav.) Sendtn.), *‘Āqarqarha* (*Anacyclus pyrethrum* DC.), *Khārdal* (*Brassica nigra* Linn.), *Dārchīnī* (*Cinnamomum zeylanicum* Blume), *Kabābchīnī* (*Piper cubeba* Linn. f.), *Post Bekh-i-Khar Zehra* (root bark of *Nerium oleander* Mill.), *Qust* (*Sassurea lappa*) are boiled in water or tied in a cloth, are used for hot fomentation.^[30]

***Kimād* for stiffness and hardness at the site of injury:^[30]**

The drugs *Haldī* (*Curcuma longa*), *Meda Lakdī* (*Litsea chinensis* Lam.), 125 gm each, *Sajjī* (Washing Soda/Sodium carbonate (impure))-24 gm, *Mayda-i-Gandum*, (fine flour of Wheat)-125 gm, *Roughan Simsīm* (Sesame oil)-250 gm are powdered. Fry the flour in the oil, then the powdered drugs is added in reverse order as mentioned i.e. starting from *Sajjī* drug. Then some quantity of water is added and cooked till all volume of water is evaporated and oil remains. Hot fomentation is done with this paste and hot oil.

Formulation of *Takmīd* to reduce pain and swelling:^[30]

Crushed aged *Khopra* (dried fruit of *Cocos nucifera* Linn.) 1 part, *Haldī Safūf* (turmeric powder)-1/4th part, *Mom* (Wax) cumulative weight of all drugs. These drugs are tied in a cloth and hot fomentation is done for few minutes by mildly heating the poultice. Thereafter the drugs are removed from the cloth and applied on the swelling and pain site. It is done for 2 to 3 days.

***Takmīd Muhallil* to resolve the morbid matter of inflammation: It is advised in last stage.^[41]**

Crushed *Bājra* (*Pennisetum glaucum* R. Br.), *Sabūs-i-Gandum* (wheat husk), *Namak Ta‘ām* (common salt). These ingredients are tied in cloth to make a poultice. This poultice is heated and used for hot dry fomentation.

***Takmīd Musakkīn* that is highly beneficial to reduce inflammation and relief pain associated with *Waram-i-Sadī* (Mastitis)^[41]**

The drugs *Post Khashkhāsh* (fruit rind of *Papaver somniferum* Linn.)-24 gm, *Arq Gulāb* (Rose distillate) 240 ml are boiled, 6 gm of *Roghan Deodār* (Tarpine oil) is added and then hot fomentation is done with a cloth/towel dipped in the hot mixture.

Contraindications of *Takmīd* (Fomentation):^[10, 14,16]

- Within the first 24 hours after traumatic injury: *Takmīd Hār* (Hot fomentation) is contraindicated as rise in body temperature increases bleeding and edema. In this case cold fomentation can be done
- In localized malignant tumors: Temperature increases the risk of metastasis by accelerating the cell metabolic rate, cell growth and circulation.
- Disruption of skin integrity and deep open wound: Subcutaneous and deep tissues are more sensitive to temperature changes. Because they do not contain the heat receptors and few pain receptors are found.

- In skin problems and blistering: Rise in Temperature can cause severe damage or skin burns.
- In diseases where sensitivity of touch and pain reduces or lost such as in diabetes mellitus, paralysis, unconsciousness fomentation either hot or cold is not advisable.
- Hemorrhagic disorders and varicose veins.
- In infants, children and elderly individuals: Having a thin skin layer in children, decreasing sensitivity to pain and in the elderly decrease in sensation increases the risk of burns or tissue damage.
- Edema or scar regions: Intracellular accumulation of fluid or thickening caused by scar tissue reduces the sensitivity to temperature.
- Cold fomentation is contraindicated in case of *Waram-i-Rikhw* (cold type of inflammation).^[3,10,14]
- Rāzī with reference to the book *Ebiṣṭmiya* part 6, chapter 6, mentioned that Hippocrates did not favor the cold fomentation in later stage of swelling as *Burūdat* (coldness) makes the morbid matter more viscous preventing its dispersion and with reference to another physician Rufas, Rāzī quoted that massage with oils is more beneficial in such conditions.^[10] Sometimes pain aggravates on fomentation and produces distension. In that case it should be stopped and other measures are adopted.^[10]

Scientific exploration of various effects produced by *Takmīd* (fomentation).

There is vast literature available in Unani medicine on therapeutic effects of *Takmīd*. This therapy has shown promising results (fomentation) in clinical studies as well.

Effects on joint’s pain

A study conducted by Ansari *et al.*, (2019) to evaluate the efficacy of *Takmīd Hār Raṭb* in a patient suffering from pain in both knee joints, along with the swelling and mild tenderness. *Takmīd Hār Raṭb* is given by warm decoction of drugs including *Babūna* (dried leaves and branches of *Matricaria chamomilla* Linn.), *Nākhūna* (dried legumes of *Melilotus alba* Desr.), *Mako Khushk* (dried fruits of *Solanum nigrum* Linn.), *Gul-i-Tesu* (dried flowers of *Butea monosperma* (Lam.) Taub.), *SūranjānTalkh* (dried corn of *Colchicum luteum* Bak.) and *Namak-i-Lāhori* (Rock salt) in crude form locally for 10 sittings of alternate application. Along with local treatment, oral compound drug *Habb-i-Sūranjān* 2 tablets twice a day is also given for 30 days. Result showed *Takmīd Hār Raṭb* (Hot and moist fomentation) along with *Habb-i-Sūranjān* pills helps in reduction of pain and effective in the treatment of *Waja‘ al-Rukba* (Knee Osteoarthritis) without any side effect.^[44]

Effects on neck pain:

In another clinical study, Chinese herbal fomentation has been reported effective in chronic neck pain. The study conducted on seventy-six patients. Patients were randomized into two groups. Fomentation combined with

Chinese herbs (Group 1) and fomentation without any medicine (Group 2). In both groups, the fomentation lasted for an hour and heated to 35 °C, once a day for 28 consecutive days. Before and after intervention, results showed improve mobility in terms of range of motion (ROM) and instantaneous center of rotation ICR in patients receiving Chinese herbal fomentation and proposed to be an effective treatment for chronic neck pain.^[45]

Effects on thrombophlebitis

Another clinical study showed reduction in swelling and pain associated with intravenous cannulation induced thrombophlebitis through moist heat and cold application.^[46] A study was conducted to assess and compare the effectiveness of moist heat versus ice packs application in reducing the signs and symptoms of intravenous cannulation induced thrombophlebitis among 60 patients (30 in each group). Moist heat and ice packs application for 20 minutes every two hourly were given to both the group. Modified visual infusion phlebitis was used to assess the prevalence of sign and symptoms of I.V. cannulation thrombophlebitis, and Numerical Rating Scale was used for pain assessment. Results showed both were equally effective in reducing the signs and symptoms of I.V. cannulation induced thrombophlebitis i.e. pain, erythema, induration and warmth; but ice packs had immediate effects in reducing the signs and symptoms of I.V. cannulation induced thrombophlebitis.^[47] Babu *et al.*, (2016) reported that local application of both hot fomentation and cold compress over the infiltrated site is equally effective in resolution of intravenous infiltration and associated pain.^[48]

Effects on breast engorgement

Manna *et al.*, (2016) conducted a study to compare the effectiveness between hot fomentation and cold compression as the treatment of breast engorgement in 60 lactating mothers. Patients were distributed in two groups (30 in each) and given the therapy for three consecutive days. The results showed that hot fomentation and cold compression both were effective in reducing the breast engorgement and cold application was found more effective in reducing the pain intensity associated with breast engorgement.^[49] Application of warm compresses on breasts, before feeding helps to activate of the milk ejection reflex. Similarly, application of cold compression to the breast between feedings reduces breast engorgement.^[50] It is also reported that cold cabbage compresses and cold gel pads are effective in the treatment of breasts engorgement.^[51,52]

Effects on low back pain

Application of thermotherapy and hot water increases in soft tissue flexibility, muscle resistance, easier and better contraction of smooth muscles, and improvement in the muscles motor function.^[53] In most studies, thermotherapy and cryotherapy were effective, in long term, on pain relief in the patients suffering from low

back pain.^[54] various studies on the effect of thermotherapy illustrate that continued thermotherapy leads to reducing pain in the patients with acute low back pain, by reducing muscles spasm.^[55] Khadilkar *et al.*, (2008) reported that keeping the pain site warm (wrapped up by a blanket) for a long term in the patients with chronic low back pain reduced the pain efficiently.^[56] Another study conducted on 87 patients suffering from low backache randomly assigned to three (thermotherapy and cryotherapy as intervention, and naproxen as control) groups of 29 each treated for one week. The first (thermotherapy) group underwent treatment with hot water bag and naproxen, the second (cryotherapy) group was treated with ice and naproxen, and the naproxen group was only treated with naproxen. Results showed more reduction in pain in thermotherapy and cryotherapy groups compared to control one (naproxen group) and indicated application of thermotherapy and cryotherapy accompanied with a pharmacologic treatment to relieve low back pain.^[57]

Effects on fever

A randomized clinical trial was conducted on 88 children (aged 12-20 months) to compare the effectiveness of cold water sponging with that of oral use of paracetamol in the treatment of fever (38.0-40⁰ C) and concluded that cold water sponging, although producing rapid reduction in temperature compared with Paracetamol, has effects that last only for a short time and its use as first aid measure before definitive treatment of the underlying cause of the fever.^[58]

Effects in dysmenorrhoea

Junyoung Jo and Sun Haeng Lee reported the effectiveness of heat or hot fomentation to ease menstrual pain. The application of local heat reduces muscle tension and relaxes abdominal muscles to reduce pain caused by muscle spasms as well as increases pelvic blood circulation to eliminate local blood and body fluid retention, diminishing congestion and swelling, thereby enabling a reduction in pain caused by nerve compression.^[59]

Effects on leg discomfort

Unani physicians have recommended hot fomentation in the treatment of pain in lower limb and fatigue.^[3] A clinical study conducted by Aderhold and Perry reported that passive heating (keeping legs immersion in hot water for 30 minutes) relaxes muscles and increases blood flow to the limbs.^[60] Parashar *et al.*, (2014) conducted a study to determine the effects of hot fomentation on leg discomfort among sixty Chronic Kidney Disease (CKD) patients. Patients and were divided into two groups experimental and control group (30 in each group). Hot fomentation was given twice a day for three days in experimental group. The results concluded that hot fomentation was effective in reducing leg discomfort score.^[61]

CONCLUSION

Based on the above mentioned literature, it can be concluded that *Takmīd* as a component of *'Ilāj bi'l Tadbīr* (Regimental therapy) is frequently used therapy alone or in combination with other modules of treatment in Unani system of medicine. The physiological effects of heat and cold demonstrated by Unani scholars and modern scientists provided sufficient evidence indicating the importance of this ancient old therapy. *Takmīd* is done for dispersion of gaseous matter, in relieving pain, subsiding inflammation, relieving muscular spasm, joint stiffness, etc. as well as in management of various diseases. Unani system of medicine being a holistic medicine offers potential therapies which are proved beyond doubt in solving the health problems successfully.

However, there are some points that are required to make this therapy more popular and useful. The existing Unani literature does not clarify the required temperature, duration and frequency of *Takmīd* (fomentation); hence, there is a need to develop Standard Operative procedures in *Takmīd* therapy. Non pharmacologic measures are underused in the management of diseases. The current knowledge on the therapeutic benefits of heat and cold application is insufficient and more scientific studies are required in this direction.^[62] It has been frequently combined with other treatment modules and few studies are conducted on effectiveness of hot fomentation alone. Thus, a far-reaching research is needed to perform this therapy alone to set up its efficacy in the management of various ailments.

CONFLICT OF INTEREST

The authors have no conflicts of interest.

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