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Editorial

Herbal origin drugs have been playing an important role in the prevention and treatment of various diseases. Due to their cost effectiveness and less associated side effects, the traditional medicine which mainly rely on such drugs has witnessed resurgence and highest ever demand at global level in the recent past. Unani System of Medicine, which primarily depends upon such drugs, too got its share from the change in the patient's behavior of shifting towards the traditional medicine in spite of vast development in the field of modern medicine and surgery. The contributions of the Central Council for Research in Unani Medicine in the area of research and drug development as well as its publicity through various publications have played significant role in increasing the acceptability of Unani System of Medicine. In particular, the Hippocratic Journal of Unani Medicine (HJUM) has been crucial in the propagation and dissemination of research in the system. The HJUM has been published as a peer-reviewed journal since 2006. However, a few of the issues of the journal could not be published in time due to compelling circumstances in the recent past. The current issue is one of them which is being published in an effort to clear the backlog and maintain continuity of the journal.

The current issue contains seven papers, including four research papers, one case study and two review papers. The first paper determines the efficacy of Dry Cupping Therapy (DCT) in the management of *Waja' al-Mafāṣil* (Joints pain). The authors in this paper conclude that DCT is effective in reducing joints pain and all the associated complaints. The second paper demonstrates how effective is the rhizome of *Alpinia galanga* L., commonly known as *Khulanjān* in Unani System of Medicine, in diabetic rats while the third paper evaluates the efficacy of Unani pharmacopoeial formulation *Raughan Iksīr* on the patients of *Waja' al-Asnān* (Toothache). The fourth paper highlights the different samples of *Duqū* (*Peucedanum grande* C.B.Clarke) sold in the market and authors of this paper suggest that *Duqū* should not be equated with *Shaqāqul* or other Umbelliferous plants. The fifth paper is a case study and proves Unani drug Leuco-Bars oil and *Ma'jūn Dabīd al-Ward* are effective in the treatment of Vitiligo. The sixth paper reviews the concept of blood in Unani Medicine and brings in an explicit account of the age-old Unani concept of blood with a view to helping the scholars, researchers and practitioners to have a proper understanding of blood. The last paper attempts to review the establishment of a format to assess *Sū'-i Mizāj* (Deranged Temperament) in *Aujā'-i Mafāṣil*. The author in this paper concludes that the description available in Unani literature about the *Sū'-i Mizāj* is valid for correct diagnosis of *Aujā'-i Mafāṣil*.

I hope that the papers included in this issue would be of great help to the scientists and scholars. I sincerely appreciate efforts of all the authors who have contributed papers and thank all the reviewers who spared their valuable time to scientifically scrutinize them. I call upon researchers / academicians to contribute their papers for publication in this journal in more active manner.

New Delhi
May 23, 2019

Prof. Asim Ali Khan
Editor-in-Chief

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Efficacy of Cupping Therapy in the Management of Waja-al-Mafasil - A Preliminary Study

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Abstract

The objective of the study was to determine the efficacy of Dry Cupping Therapy (DCT) in Waja-al-Mafasil (joints pain). After qualifying inclusion and exclusion criteria; 27 subjects were selected on convenient sampling basis; out of which 13 patients (Group A) were given medicines i.e. Safoof-e-Suranjan, Majoon-e-Suranjan and Raughen-e-Suranjan along with DCT whereas 14 patients (Group B) were subjected to DCT only. This study was conducted from 1 March 2013 to 1 March 2014. The patients were enrolled directly from the general out patients department and mobile clinical research unit run by Regional Research Institute of Unani Medicine, Patna and treatment continued for six weeks. 3-4 well sterilized plastic cups of 1 to 3 numbers were applied on the affected joint for 10-15 minutes once a week. Total seven sittings of DCT were conducted on every subject of both the groups. Medicines were given to the group A daily for six weeks along with DCT. Results indicate that cupping therapy is an effective procedure in reducing joints pain and all the associated complaints ($p<0.0001$) and gives much significant ($p<0.0001$) results with medication.

Keywords: Alternate therapy, Cupping therapy, Hijamah, Ilaj-bit-Tadbeer, Waja-al-Mafasil

Introduction

Hijamah is literally derived from an Arabic word ‘hajm’ which stands for volume but technically this word is used for “to suck”. Hijamah is one of the processes of Unani system of medicine practised for many diseases. Broadly Hijamah is of two types i.e. Hijamah bila shurt (cupping without bloodletting-dry cupping) and Hijamah bil shurt (cupping with bloodletting- wet cupping). The dry cupping therapy or Hijamah Bila Shurt is a form of Unani treatment (Ilaj- Bit- Tadbeer) being practised world-wide for musculoskeletal pain. Its evidence exists in the classical literature of Unani medicine from the time of Buqrat (Hippocrates 460-370 BC). In this therapy, cups are placed on the skin by manual suction which creates a small area of low air pressure producing pressure gradient and a traction force across the skin and underlying capillaries to drain interstitial fluids and enhance blood circulation and waste excretion through skin. When the cup is left in place on the skin for a few minutes, blood stasis is formed and localized healing takes place. It works on the principle of Imala-e-Mavad i.e. diversion of morbid matter from the disease part which helps in its excretion from the body. This is done in order to preserve health and prevent diseases. Cupping improves the eliminative functions and evacuation of wastes from the body by improving the circulation of blood, lymph and other vital fluids and breaking up and dispersing blockages and congestions offending waste matter, toxins and morbid humors. It also acts as pharmacological potentiator as it helps increasing the response of the drugs in pain conditions (Sayed *et.al.*, 2013).

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Waja or Pain is the most common reason for seeking therapeutic alternatives to conventional medicine. Waja-al-mafasil or joints pain is a vast term which includes several types of painful conditions of joint such as osteoarthritis, osteoporosis and rheumatoid arthritis. It is prevalent in communities across the globe and widely spreading (Woolf, 2003). Knee pain is the most common joints pain complaint followed by shoulder and hip pain (Richard *et.al.*; 2010). This is the most common cause of severe long term pain and disability and currently reported to be affecting hundreds of millions of people around the world (Woolf, 2003; Allison et.al., 2002; Ghasemkhani et.al., 2008).

Joints pain affects approximately 25% of adults, limits function and mobility and impairs quality of life (Jinks *et.al.*, 2002; Grotle *et.al.*, 2008; Peat *et.al.*, 2001; Felson *et.al.*,1998) with osteoarthritis as the most common cause of joints pain in the age group of 50 years or older (Zeni *et.al.*, 2010). 1 in 2 people suffers from arthritis by the age of 85 years according to CDC statistics on arthritis.

Joints pain is described in Unani literature under the heading of Waja -al -mafasil occurring in joints (Majoosi,1889 ; Ali,1896 ; Jurjani,1903). It is a very common problem in old age but may start at earlier stage of life specially if there is predominance of Balgham (phlegm) along with obesity, indigestion, prolonged breast-feeding, poverty, getting wet, exposure to cold and humid climates (Kabeeruddin, 2007). According to Unani system of medicine, pain in any part is due to stagnation of bad humor. This stagnation can be a result of injury, stress, lack of blood supply or invasion of cold in the body and joints. Hijamah or Cupping is a method of clearing local congestion. A partial vacuum is created in cups and then placed on skin either by means of heat or suction. This draws up the underlying tissues. When the cup is left in place on the skin for a few minutes, blood stasis is formed and localized healing takes place. Cupping therapy on the specific points provide warmth and helps to release the stagnation of blood and body fluids and ultimately results in reduction of pain occurring due to any reason (Azam, 2007). If there is ingression of coldness (*barudat*) in certain body part, cupping provides heat to that part by increasing the blood circulation (Masih, 1986). It further reduces pain with the effective component through the limbic response. Therefore, the tactile stimulus of dry cupping may be responsible for the analgesic effect (Sayed et. al.,2013). The reduction in pain scores can be attributed to the cupping therapy as it can elicit the release of morphine like substances such as serotonin, endorphins or cortisol which can relief pain and alter the physiological status of the individual. At biological level, cupping therapy works by stimulating or activating the immune system; enkephalin secretion; neurotransmitter release, vasoconstriction and dilatation and the gates for pain in the CNS which interpret pain sensation (Ullah *et.al.*, 2007).

Methodology

The study was designed as a controlled trial to evaluate the efficacy of dry cupping therapy in patients of joints pain. 27 patients suffering from joints pain were

selected from the general out patients department (GOPD) and mobile clinical research unit (MCRU) run by Regional Research Institute of Unani Medicine, Patna. The duration of the treatment and therapy was six weaks.

Inclusion criteria

Patients of either sex in the age group of 18-65 years presenting joints pain (single/multiple joints) with or without anyone of the following symptoms/signs: tenderness, swelling and restriction of movement

Exclusion criteria

1. Patients having disorders requiring long term treatment: Diabetes Mellitus, Hypertension, COPD, Parkinsonism, Epilepsy.
2. H/O Addictions (Alcohol, drugs)
3. Pregnant and lactating women
4. Known cases of hepatic, renal or cardiac ailments

The patients were enrolled in the study after getting written consent from them. All the cases were subjected to the following Haematological (CBC- Hb%, TLC, DLC, ESR), Biochemical (LFT- S. Bilirubin, SGOT, SGPT, S.Alkaline Phosphatase and KFT- Urea, Creatinine, RA Factor) and Radiological (X-Ray of affected joint) investigations. Pulse of each patient was measured according to Unani parameters and naked eye examination of urine and stool was also done on Unani parameters for diagnosis of disease and rule out any major abnormality as in waja-al-mafasil urine becomes light and less in quantity and stool bears some balgami madda. . The Mizaj was assessed according to Ajnas Ashra points at the baseline. The safety of the therapy and drugs was evaluated clinically by monitoring adverse effects on every visit. The safety was also evaluated on the basis of the laboratory investigations like CBC, LFT, KFT and Urine R/M done at the time of inclusion and end of the study.

The assessment of the patients was done according to the subjective parameters i.e. joints pain, tenderness, joints swelling, restriction of movement, morning stiffness and muscular weakness and scored on the following grading from 1 to 4.

Joints pain: (1= barely perceptible; 2=mild: can carry out daily activities with some trouble; 3=moderate: cannot carry out daily activities easily and 4=severe: bed ridden)

Tenderness: (1= on palpation patient says it is tender, when touched; 2= on palpation, patient says it is tender and winces; 3= on palpation, patient says it is tender, winces and pull back and 4=patient doesn't allow palpation)

Joints swelling: (0= no swelling/effusion; 1= barely perceptible; 2=mild; 3=moderate and 4= severe)

Restriction of Movement: (1=painful movement; 2=partially restricted movement; 3=partial movement, when the joint moved by the examiner and 4= completely restricted movement)

Morning Stiffness: (1=Up to 15 minutes, 2=15 to 30 minutes, 3=30 to 45 minutes and 4=More than 45 minutes)

Muscular Weakness: (1=Strength against gravity and added resistance, 2=Strength only against gravity, not added resistance, 3=muscular contraction occurs but not sufficient to overcome gravity and 4=Muscular contraction with little or no movement)

Safety of the drugs was assessed by recording the adverse events (AEs) reported by the patient and laboratory parameters.

Outcome Measures

Outcome measure was assessed on the following parameters:

60-89% improvement in the signs and symptoms of disease i.e. joints pain, tenderness, joints swelling and restriction of movement = Relieved

30-59% improvement in the signs and symptoms of disease i.e. joints pain, tenderness, joints swelling and restriction of movement = Partially Relieved

< 30% improvement in the signs and symptoms of disease i.e. Joints pain, tenderness, joints swelling and restriction of movement = Not Relieved

Therapy Schedule and Drug Doses with their Mode of Administration

The patients were divided into two groups i.e. group A having 13 patients and group B having 14 patients and treatment continued for six weeks. In group A, patients were given medication along with DCT while in group B, patients were subjected to DCT only. For DCT, joint to be cupped was first cleaned thoroughly then sterilized by spirit swab. Cupping cups of size 1-3 were directly applied by manual suction on the muscular area of the affected joint for 10-15 minutes in the morning between 10 am and 11 am once a week. The clean sterile cups of size 1-3 were taken and placed on the muscular part of the joint. Suction was created and controlled according to the therapeutic indications till the cup is firmly adhered to the skin. The suctioned cup is kept at that position for up to 15 minutes or less if skin starts changing colour to purple. Then the cups are removed by releasing the valve pressure. Total seven sittings of DCT were conducted on every subject of both the groups. Group A was given Majoon-e-Suranjan (7gm), Safoof-e-Suranjaan (6gm) orally, twice daily with normal water after meals and Dalk (massage) with Raughen-e-Suranjaan on the affected joints at bed time daily and DCT was done once a week. Dalk-e-motadil i.e. moderate type of massage with soft hands for 20 minutes with Raughen-e-Suranjaan on affected joint was advised to the patient before bed time. Vitals i.e. temperature, blood pressure, respiratory rate and pulse were checked and recorded at every visit.

Table 1: Majoon Suranjaan (Anonymous, 2001)

Name of the Ingredient	Botanical Name	Qty
Suranjaan Shireen	Colchicum autmnale L.	500gm
Barg-e-Sana	Cassia angustifolia Mill.	250gm
Zanjabeel	Zingiber officinale Roscoe.	100gm
Zeera Siyah	Carum carvi L.	100gm
Filfil draz	Piper longum L.	100gm
Asaroon	Asarum europaeum L.	100gm
Qand safaid	Saccharum officinarum L.	3.5kg

Table 2: Safoof Suranjaan (Anonymous, 2001)

Name of the Ingredients	Botanical Name	Qty
Suranjaan Shireen	Colchicum autmnale L.	25gm
Buzidaan	Pyrethrum indicum Linn.	25gm
Post-e-Halela Zard	Terminalia chebula Retz.	25gm
Maghz-e-Tukhme-e-Tarbooz	*Citrullus vulgaris* (Thunb.) Matsum. & Nakai	25gm
Maghz-e-badam	Prunus amygalus Batsch.	25gm
Maghz-e-Tukhme-e-badranjboya	Nepata hindustana L.	25gm
Maghz-e-Tukhme-e-khiyar-draz	Cucumis sativus L.	25gm
Kishneez Khush	Coriandrum sativum L.	25gm
Tukhm-e-khashkhash	Paper somniferum L.	25gm
Qand Safaid	Saccharum officinarum L.	225gm

Table 3: Raughen Suranjaan (Anonymous,2001)

Name of the Ingredients	Botanical Name	Qty
Suranjaan talkh	Colchicum luteum L.	50gm
Aab-e-karafs	Apium graveolens L.	50gm
Chiraita	Swertia chirata L.	25gm
Raughen Zaitoon	Olea europaea L.	150gm

Follow - up Methods During and After the Treatment

The clinical evaluation of all the cases was carried out at an interval of two weeks i.e. at the baseline, 2nd week, 4th week and 6th week (final) on the basis of clinical history and physical examination.

The investigations were repeated after the treatment. Statistical analysis was done using Student's Paired't' test and the confidence level was set to be $p<0.001$.

Assessment of Safety

Safety of the regimenal therapy (DCT) and study drugs was assessed by recording adverse events (AEs) reported by the patient, biochemical investigation (LFT, KFT, Blood Glucose Level) and pathological investigations (CBC, Urine examination: Routine and Microscopic) done at the baseline and end of the study.

Results

In all, 11 males and 16 females were enrolled in the study. It indicates more prevalence among females as compared to males. The maximum number of patients i.e. 10 (37.04%) were in the age group of 51-60 years, 7(25.93%) in the age group of 31-40 years; 5(18.52%) each in the age group of 20-30 years and 41-50 years revealing aged people are more prone to develop this disease. The mean age group is 44±2.44 years, having disease chronicity from 1-6 months old. Out of 27 cases, two were of damwi mizaj, 23 balghami mizaj and two safrawi mijaz. Majority of the patients enrolled in the trial suffered from knee joint pain i.e. 88.88%, followed by 3.7% each low back pain, wrist joint and ankle joint. In group 'A', all the cases were partially relived whereas in group B, nine cases were partially relieved and five not relieved. Group A patients showed better improvement in symptoms; DCT with medicine showed 1.85±0.1 from 3.69±0.1 i.e. 49.86% efficacy in joint pain, 1.85±0.1 from 2.92±0.08 i.e. 36.64% relief in tenderness, 1.62±0.14 from 2.92±0.083 i.e. 44.52% relief in joint swelling, 1.62±0.14 from 3±0.0 i.e. 46% relief in morning stiffness, 1.46±0.14 from 2.31±0.13 i.e. 36.80% relief in restriction of movement, 1.15±0.1 from 2.08±0.08 i.e. 44.71% relief in muscular weakness compared to group B showing 1.79±0.11 from 3.29±0.13 i.e. 45.59% relief in joint pain, 1.93 ±0.13 from 2.86± 0.1 i.e.32.52% in tenderness, 2±0.1 from 3±0 i.e. 33.33% relief in joint swelling,1.86±0.1 from 2.93±0.07 i.e. 36.52% relief in morning stiffness,1.43±0.14 from 2.21±0.11 i.e. 35.29% relief in restriction in movement and 1.5 ±0.14 from 2.07±0.07 i.e. 27.54% relief in muscular weakness (Table 4).

Table 4: Effect of Unani Pharmacopieal Formulation Majoon-e-Suranjan, Safoof Suranjan and Raughen-e-Suranjan and DCT on Symptoms in Respective Groups (A&B) Before and After the Treatment

Clinical Symptoms	Group-A			Group-B		
	Mean ± SEM		Efficacy (%)	Mean ± SEM		Efficacy (%)
	Before Treatment	After Treatment+ DCT		Before starting of DCT	After seven sitting of DCT	
Joint Pain	3.69 ± 0.13	1.85 ± 0.1***	49.86	3.29 ± 0.13	1.79±0.11***	45.59
Tenderness	2.92 ± 0.08	1.85 ± 0.1***	36.64	2.86 ± 0.1	1.93 ±0.13***	32.52
Swelling	2.92 ± 0.08	1.62±0.14***	44.52	3 ± 0	2 ± 0.1***	33.33
Morning Stiffness	3 ± 0	1.62±0.14***	46.00	2.93 ± 0.07	1.86 ± 0.1***	36.52

Clinical Symptoms	Group-A			Group-B		
	Mean ± SEM		Efficacy (%)	Mean ± SEM		Efficacy (%)
	Before Treatment	After Treatment+ DCT		Before starting of DCT	After seven sitting of DCT	
Restriction of movement	2.31 ± 0.13	1.46 ± 0.14***	36.80	2.21 ± 0.11	1.43 ±0.14***	35.29
Muscular Weakness	2.08 ± 0.08	1.15 ± 0.1***	44.71	2.07 ± 0.07	1.5 ± 0.14***	27.54

Table 5: Response of Unani Pharmacopieal Formulation Majoon-e-Suranjan, Safoof Suranjan and Raughen-e-Suranjan on Both the Groups (A&B)

Group	No. of Patients (n)	Completely Relieved (90-100%)	Relieved (65-89%)	Partially Relieved (30-64 %)	Not Relieved (< 30 %)
A	13 (48.15 %)	-	-	13 (48.15 %)	-
B	14 (51.55 %)	-	-	9 (33.33 %)	5 (18.52 %)
Total	27 (100 %)	-	-	22 (81.48 %)	5 (18.52 %)

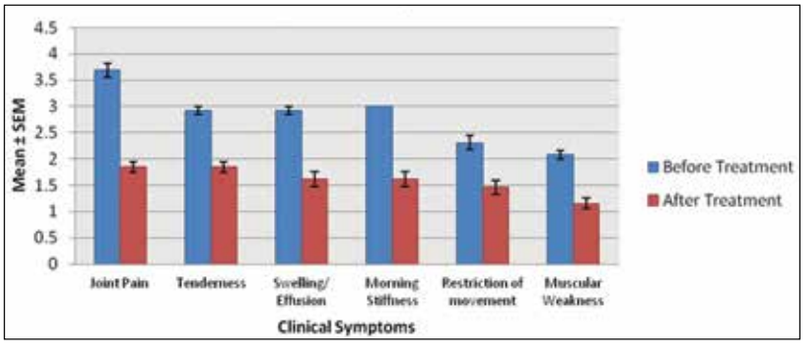

Fig. 1.1: Effect of Unani pharmacopieal formulation Majoon e Suranjan, Safoof Suranjan and Raughen-e-Suranjan on different symptoms associated with Waja ul Mafasil (Group-A)

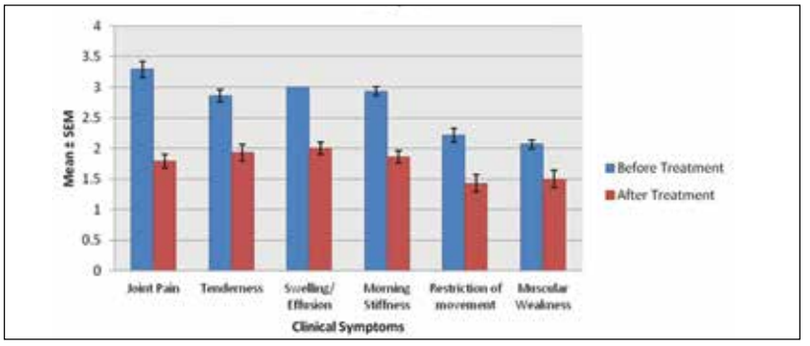

Fig. 1.2: Effect of Unani pharmacopieal formulation Majoon e Suranjan, Safoof Suranjan and Raughen-e-Suranjan on different symptoms associated with Waja ul Mafasil (Group-B)

Discussion

The aim of this study was to test the efficacy and safety of DCT in patients with joints pain. More females were found to have this as compared to males (Anonymus, 2008). The highest number of patients treated were from phlegmatic temperament (Balghami Mizaj) i.e., 85.19% correlating to the etiology of joint pain described in Unani classical texts and as reported by (Tanwir *et.al.* 2013) that the persons of balghami mizaj are more prone to develop joints pain. Within the last few years the interest in cupping therapy has emerged and there is growing evidence that cupping might be effective in various pain conditions (Ahmadi *et.al.*,2008; Cao *et.al.*, 2011; Farhadi *et.al.*, 2009; Kim *et.al.*, 2011; Michalsen *et.al.*, 2009). Due to the limited treatments, patients seek alternative treatment options, especially those patients with more intense pain (Ndao-Brumblay, 2010) and those who have not experienced improvements under conventional treatment (Last *et.al.*, 2009). In modern medicine, there is no treatment modality that can purify both blood and interstitial fluids from noxious substances that are responsible for (or resulting from) disease pathogenesis. Cupping therapy is a simple, effective, economic, time saving and synergistic line of treatment with pharmacotherapy. It acts as a pharmacological potentiator by providing synergistic therapeutic effects via combining more than one drug with one mechanism of action as it reduced all symptoms i.e. Joint Pain by 49.86%, Tenderness 36.64%, Swelling 44.52 %, Morning Stiffness 46.00%, Restriction of movement 36.80 % and Muscular Weakness 44.71% showing better results with DCT. It also aims at decreasing drug dose, frequency of drug administration and possible side effects. According to Unani system of medicine, pain is due to stagnation of bad humor. Cupping therapy helps in clearing local congestion. It provides on specific points warmth and helps to release the stagnation of blood and body fluids by increasing the blood flow and facilitates the flow of lymph at that particular point and ultimately results in reduction of pain occurring due to any reason (Azam, 2007, Masih, 1986, Sayed et. al., 2013). Cupping therapy in addition to above mechanism also works by stimulating or activating the immune system; enkephalin secretion; neurotransmitter release, vasoconstriction and dilatation and the gates for pain in the CNS which interpret pain sensation. The reduction in pain scores can be attributed to the cupping therapy as it can elicit the release of morphine like substances such as serotonin, endorphins or cortisol which can relief pain and alter the physiological status of the individual(Ullah *et.al.*, 2007).

Various studies have shown that cupping therapy effectively treats musculoskeletal pain conditions as lumbar disc herniation, cervical spondylosis (Cao,2012), persistent nonspecific low back pain (Last,2009), fibrositis (Zhang ,2009), fibromyalgia (Cao *et.al.*, 2011), chronic nonspecific neck pain (Kim *et.al.*,2012), chronic knee osteoarthritis (Teut *et.al.*, 2012) and other pain conditions e.g. pain of dysmenorrhea (Sultana *et.al.*, 2012) and pain of acute gouty arthritis (Zhang *et.al.*, 2010). DCT is beneficial and curative and degree of therapeutic benefits gained depends on the degree of response and improvement of disease pathogenesis in response to the serum clearing effect. (Sayed, et. al., 2013)

Suranjan is the main ingredient of safoof-e-Suranjan, majoon-e-suranjaan and Raughen Suranjan whose active principle is colchicines. Study done by (Ishtiyaq *et.al.* 2014) showed that Colchicine effectively treats rheumatoid arthritis. Nair *et.al.* (2012) concluded anti-inflammatory and anti-granuloma activity whereas Jawed *et.al.* (2005) found anti-rheumatic activity. Safoof-e- Suranjan was given to patients with majoon-e-suranjaan so as to obtain the synergistic response of their ingredients taking the consideration of Mizaj in suffering age group. As Waja-al-Mafasil is a disease of old age, according to Unani theory, mizaj in old age tends to incline towards dryness. So as to combat dryness of Majoon-e-Suranjaan, safoof-e-suranjaan due to its almost ratab nature of ingridients was choosen for the study. The above chosen combination showed tolerance and compliance in patient without yielding any adverse response. Raughen Suranajan contains Raughen Zaitoon as the other ingredient which is reported to have anti-inflammatory effect (Fezai *et.al.*, 2013). Dalk is used for the preventive as well as therapeutic indications. Dalk Motadil was undertaken as a manipulative technique over the muscles to produce Hararat (heat), hence causing Tahallul (dissolvent) and Riqqat (liquidity) in Fuzlat (morbific matter). It also strengthens the Autar (ligaments) wa Azlat (muscles) and evacuates the Fuzlah of Hazm Akheer (waste metabolites of the body) [Ibne Rushd,1987; Ibn Sina, 2010]. So it can be assumed that it is due to active principles and possible mechanism of Dalk and Cupping therapy i.e. synergistic effect of drugs and therapy are able to produce significant effect on joints pain.

Conclusion

Cupping therapy is very effective treatment for a variety of diseases. It deserves more research attention as it may potentiate the therapeutic effects of pharmacological treatments. Clinical and basic research will be necessary to fully understand its mechanisms and clinical value so as to gain better therapeutic effects and patients' benefits when combining pharmacological treatments with cupping therapy.

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सारांश

वजा-अल-मफ़ासिल के उपचार में कपिंग थेरेपी की प्रभावकारिता - एक प्रारंभिक अध्ययन

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अध्ययन का उद्देश्य वजा–अल–मफ़ासिल (जोड़ो का दर्द) में सूखी कपिंग थेरेपी (डीसीटी) की प्रभावकारिता को निर्धारित करना था। समावेश और अपवर्जन मानदंड चयन के बाद; 27 रोगियों को सुविधाजनक नमूने के आधार पर चुना गया; जिसमें से 13 रोगियों (ग्रुप ए) को डीसीटी के साथ–साथ सफ़ूफ़–ए–सुरंजान, माजून–ए–सुरंजान और रोग़न–ए–सुरंजान औषधियां दी गईं जबकि 14 रोगी (ग्रुप बी) सिर्फ डीसीटी के अधीन रखे गए। यह अध्ययन 1 मार्च 2013 से 1 मार्च 2014 तक किया गया। रोगियों को क्षेत्रीय यूनानी चिकित्सा अनुसंधान संस्थान, पटना द्वारा संचालित सामान्य रोगी विभाग और चल नैदानिक अनुसंधान एकक से सीधे नामांकित किया गया और छः सप्ताह तक उपचार जारी रहा। 1 से 3 नंबर के 3–4 अच्छे विसंक्रमित प्लास्टिक कप प्रभावित जोड़ पर 10–15 मिनट के लिए एक सप्ताह में एक बार लगाए गए। दोनों ग्रुपों के प्रत्येक रोगी पर डीसीटी कुल सात बार हुई। ग्रुप ए को डीसीटी के साथ–साथ प्रतिदिन छः सप्ताह के लिए औषधियां भी दी गईं। परिणाम दर्शाते हैं कि जोड़ो के दर्द और संबंधित सभी शिकायतों ($p<0.0001$) को कम करने के लिए कपिंग थेरेपी एक प्रभावकारी प्रक्रिया है और औषधि के साथ इसके बहुत महत्वपूर्ण ($p<0.0001$) परिणाम मिलते हैं।

शब्दकुंजीः वैकल्पिक चिकित्सा, कपिंग थेरेपी, हिजामा, ईलाज–बित–तदबीर, वजा–अल–मफ़ासिल

Antihyperglycaemic Activity of Extracts of Khulanjan (*Alpinia galanga*-Rhizome) in Streptozotocin Induced Diabetic Rats

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Abstract

The rhizome of *Alpinia galanga* L., commonly known as Khulanjan in Unani System of Medicine, has been used for long for the treatment of headache, impotence, rheumatic pain, sore throat and diabetes mellitus. In the present study, its aqueous and hydroalcoholic extracts were investigated for their antihyperglycaemic activity in streptozotocin-induced diabetic rats. A comparison was made between the effects of aqueous and hydroalcoholic extracts in low and high doses (70 & 140 mg/kg and 130 & 260 mg/kg, respectively) and a known antidiabetic drug Glibenclamide (0.25mg/kg) for 28 days. Fasting and postprandial blood sugar was estimated on 0, 7th, 14th, 21st, and 28th day. After 28 days, the animals were sacrificed and blood was investigated for HbA1c and liver glycogen. The effect of extracts on body weight and urine sugar was also observed. The low doses of aqueous and hydroalcoholic extract showed a significant reduction in fasting ($p<0.05$ and $p<0.01$) and postprandial blood glucose level ($p<0.05$ and $p<0.01$). HbA1c reduced to a significant level in low doses of aqueous and hydroalcoholic extract (7.08±0.3650 and 7.27±0.1858) respectively and high dose of hydroalcoholic extract (7.75±0.4216) as compared to diabetic control (10.49±0.4670) group. The low dose of hydroalcoholic extract also exhibited a significant increase in liver glycogen (53.90±7.051). The study suggests that the test drug possesses antihyperglycaemic activity.

Keywords: *Alpinia galanga*, Antihyperglycaemic activity, Diabetes mellitus, Khulanjan, Streptozotocin

Introduction

Diabetes Mellitus is a clinical syndrome characterized by an increase in plasma blood glucose level and disturbances in carbohydrate, protein and lipid metabolism. These abnormalities result due to the deficiency of insulin which may result in type 1 diabetes or insulin dependent diabetes mellitus (IDDM) and type 2 diabetes or non insulin dependent diabetes mellitus (NIDDM). Type 2 diabetes mellitus is a result of hyperglycaemia caused by overproduction of glucose at hepatic level or due to the abnormal function of β cell of pancreas or insulin resistance at target cells (Anonymous, 1948). Chronic hyperglycaemia is associated with damage, dysfunction and failure of various organs for a long time (Chattopadhyay, 1993).

In spite of the availability of effective conventional antidiabetic drugs, diabetes and its complications are continuously increasing. Many plant origin drugs that possess hypoglycaemic activity are used in various traditional

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system of medicine. The effect of these plants is attributed to their ability to increase insulin output by the pancreas or inhibit intestinal absorption of glucose (Chopra *et al.*, 1958). Pharmaceutical companies are manufacturing antidiabetic formulations based on natural drugs which are still in use by the people of India mainly because of their low cost, easy availability and less side effects, however, a little information is available on the efficacy and safety of these formulations (Frier & Fisher, 2014). Hence, an attempt has been made in this study to validate these claims on scientific parameters.

The rhizome of *Alpinia galanga* (L) Willd is found in Eastern Himalayas, Western Ghats and entire North-Eastern region of India and native of Sumatra and Java but completely naturalised in many parts of India and extensively cultivated in Bengal and South India (Grover *et al.*, 2002 and Ghani, 2010). The drug contains volatile oil (0.5-1%), resin (20%), kaempferol, galangin, alpinindihydroflavanol, galangol, phlobephine, tannins and starch in abundance. Kaempferol, galangin and alpinin are the flavonoids (Chopra *et al.*, 1958; Lubhaya, 1982; Rastogi and Mehrotra, 2001; Anonymous, 2003; Anonymous, 2004; Bhattachrjee, 2004; Farooqi, 2013). Rastogi and Mehrotra (1995) reported that the essential oil found in the rhizome exhibits antimicrobial activity against Gram-positive bacteria.

The plant is used by the practitioners of traditional medicines particularly Unani Medicine for different pharmacological effects including aromatic, stimulant, bitter, aphrodisiac, carminative, expectorant, stomachic, semen viscositive, renal tonic, anti-inflammatory and cardiotonic effects (Husain, 1888; Ibn Baitar, 1987 and Huang *et al.*, 2005). Unani scholars mentioned that Khulanjan is useful in headache, lumbago, rheumatic pain, sore throat, chest pain, impotence, bronchitis, excessive urination, dyspepsia and diseases of the kidney (Ghani, 2010 and Khan, 2013). Besides, the rhizome of *Alpinia galanga* possesses some other medicinal properties (Nadkarni, 1954; Watt, 1972 and Kirtikar *et al.*, 1987) and has been advocated to be useful in burning of liver, diabetes mellitus and diminishing the quantity of urine. In view of its effect in diabetes and related conditions, the Unani physicians use to manage the cases of hyperglycemia with the administration of *Alpinia galangal*. The present study was designed to investigate the antihyperglycaemic activity of Khulanjan in sterptozotocin induced diabetic rats.

Material and Methods

Collection of Plant Material

The study was undertaken during the year 2015-2016 at the Department of Ilmul Advia, Aligarh Muslim University (AMU), Aligarh. The drug was procured

from Dawakhana Tibbiya College, AMU, Aligarh and was identified in the light of the description available in the literature and also by the Pharmacognosy Section, Department of Ilmul Advia, AMU, Aligarh. It was further authenticated by National Institute of Science Communication and Information Resources (NISCAIR), New Delhi (NISCAIR/RHMD/Consult/2015/2843/36-1). A herbarium sample with voucher no (SC-0171/15) was prepared and submitted to *Mawalid Salasa* Museum of the Department of Ilmul Advia, A.M.U., Aligarh for future reference.

Plant of *Alpinia Galanga* (L) Willd

Market sample of rhizome of *Alpinia galanga* (L) Willd

Preparation of Extracts

The drug was powdered coarsely in an iron mortar. The dried powder was subjected to extraction in aqueous and hydroalcoholic extract (50:50) separately for 6 hours using Soxhlet apparatus. The yield percentage (14.5% and 27.5%, respectively) was calculated with reference to air dried drug and the extract was stored in a refrigerator at 2-8ºC.

Dose of the Drug

Different doses have been mentioned in the classical texts for therapeutic application, however, the dose mentioned (3.5-7g) by Khan (2013) is practiced by Unani physicians nowadays. Therefore, the same dose range was used in the present study. The dose for the rats was calculated after extrapolating the human dose of test drug by the conversion factor of 7 (Friereich *et al.*, 1966). Thus, the dose of extract of Khulanjan was found to be 70 & 140 mg/kg and 130 & 260 mg/kg in aqueous and hydroalcoholic extract respectively.

Experimental Animals

Wistar albino rats of either sex, weighing 150-200 gm were procured from Indian Veterinary Research Institute (I.V.R.I.) Izzatnagar, Bareilly, Uttar Pradesh. The ethical clearance was taken from the Institutional Animal Ethics Committee (I.A.E.C.) of Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh (401/RO/c/2001/CPCSEA). The experiments were performed by following the guidelines for the care and use of laboratory animals, laid down by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Social Justice and Empowerment, Government of India. The animals were maintained under standard laboratory condition (temperature 20±5ºC and humidity 45% to 60%) throughout the study with a regular 12-h light /12-h dark cycle. The animals were fed standard rat pellet diet (Ashirwaad) and provided water *ad libitum*.

Study Design and Dosing Schedule

The animals were divided into seven groups of six animals each. Streptozotocin was dissolved in a citrate buffer solution (pH 4.5) and was injected to all the animals intraperitoneally after overnight fasting in the dose of 50 mg/ kg. However, the animals of control group (group I) were given distilled water only. The group II (negative control) was administered only streptozotocin on the first day of the study and was then left untreated for whole duration of the study. In the animals of group III, Gilbenclamide in a dose of 0.25 mg/kg was given orally once a day as a standard drug after 7^{th} day of administration of streptozotocin for 28 days. Animals in group IV & V were treated with low and high doses (70 and 140 mg kg p.o. respectively) of aqueous extract of test drug once a day for 28 days after 7^{th} day of administration of streptozotocin. The animals in group VI and VII were given low and high doses (130 and 260 mg/kg p.o. respectively) of 50 % hydroalcoholic extract of test drug once a day for 28 days after 7^{th} day of administration of streptozotocin.

The fasting and postprandial blood glucose levels were measured on 0, 7^{th}, 14^{th}, 21^{st} and 28^{th} day. During the experimental period, the weight of rats was determined daily and the mean change in the weight was calculated. After 28 days, the animals were sacrificed under urethane (1-1.5 kg i.p.) anaesthesia and the blood sample was collected. Three ml of blood was kept in EDTA vial and 1 ml in serum separating tube. The liver was dissected out immediately after collecting the blood for the estimation of liver glycogen. The urine sugar was estimated by Benedict's method.

Statistical Analysis

The findings were statistically compared for determining the significance of difference by one-way ANOVA followed by Tukey-Kramer multiple comparison test. The values were considered significant at $p < 0.05$.

Results and Observation

Effect of Aqueous and Hydroalcoholic Extract of Test Drug on Fasting and Postprandial Blood Glucose levels.

On repeated administration of low dose of aqueous and hydroalcoholic extract of test drug for 28 days, a significant decrease in the fasting (153±17.49 and 132.16±17.32) and postprandial (169.33±20.21 and 156.16±18.34) blood sugar level was observed as compared to diabetic control group (Tables 1 and 2).

Effect of Aqueous and Hydroalcoholic Extract of Test Drug on HbA1c Level

The low dose of aqueous and hydroalcoholic extract of Khulanjan showed significant reduction (7.08±0.365% and 7.27±0.18%) in HbA1c level after 28 days as compared to diabetic control group (Table 3).

Effect of Aqueous and Hydroalcoholic Extract of Test Drug on Glycogen

On repeated administration of extract for 28 days, a slight increase in liver glycogen level (31.72±1.329) was observed in the animals treated with low dose of aqueous extract as compared to diabetic control group and a significant increase in liver glycogen level (53.90±7.051) was also observed in low dose of hydroalcoholic extract and found to be highly significant as compared to other groups (Table 4).

Effect of Aqueous and Hydroalcoholic Extract of Test Drug on Body Weight

A significant increase in the body weight (193.3±4.41) was observed in the animals which received a low dose of aqueous extract after 28 days as compared to other groups and the low dose of hydroalcoholic extract also increased the body weight of the animals (173.3±2.76) significantly after 28 days of treatment (Table 5).

Effect of Aqueous and Hydroalcoholic Extract of Test Drug on Urine Sugar

After 28 days of the treatment, the concentration of sugar in urine was determined and the low dose of aqueous and hydroalcoholic extract showed absence of sugar in urine (Table 6).

Discussion

Diabetes mellitus is an endocrine disorder which is characterized by hyperglycaemia (Brownlee, 2001). Management of diabetes mellitus without any adverse effect is still a challenge to the medical science as most of the currently available conventional antidiabetic drugs have known adverse effects. On the other hand, plant drugs over the centuries due to easy access and lesser side effects in most of the cases have enjoyed a special place for the treatment of diabetes (Grover *et al.*, 2002). Injection of 60 mg/kg steptozotocin in adult rats makes pancreas swell and at last causes degeneration in Langerhans islets of beta cells and induces diabetes mellitus in 2-4 days (Akbarzadeh *et al.*, 2007). Induction of diabetes with streptozotocin is associated with characteristic loss of body weight which is due to increased muscle wasting and loss of tissue protein (Swanston *et al.*, 1990). In the present study, the aqueous and hydroalcoholic extract of rhizome of *Alpinia galanga* (L) Willd exhibited a significant antihyperglycaemic effect at the low doses when compared to diabetic control group. The test drug was found to decrease the fasting and postprandial blood glucose level and also the HbA1c, while it increased the liver glycogen level. The low dose of hydroalcoholic extract of test drug lowered the fasting blood glucose level even more than the standard drug Glibenclamide indicating a striking glucose lowering effect possessed by the test drug. Similarly, it was also found that the low dose significantly increased the liver glycogen level more than the level measured in standard group. These findings demonstrated that the test drug is effective in diabetes mellitus. During the study, it was also observed that significant result was not seen at high dose of the extracts. The exact reason for greater response with low dose as compared to the high dose could not be ascertained. It appears that the test drug at low doses has specific biological response; however, when the dose is increased the response decreases because of some unknown reasons. It means that the test drug is mainly effective in low dose and that it does not possess dose dependant response as far as the hypoglycaemic effect is concerned. Diabetic rats treated with low dose of the extract of Khulanjan showed an increase in body weight which may be attributed to its ability to arrest the muscle wasting. The findings of the present study indicate that the test drug may have some phytochemicals which are responsible for lowering the glucose level at a specific concentration. However, further studies on the rhizome of *Alpinia galanga* (L) Willd and its compounds are suggested to elucidate the exact mechanism of actions.

Conclusion

Khulanjan gives a significant antihyperglycaemic effect; therefore, it may be used singly or in combination with other herbal drugs in the management of diabetes mellitus.

Table 1: Effect of Aqueous and Hydroalcoholic Extract of Khulanjan on Fasting Blood Glucose Level

Groups	Treatment	Fasting Blood Sugar Level				
		0 day	7th day	14th day	21st day	28th day
I	Control	101.66± 5.85	109.66± 3.87	103.83± 2.19	100.16± 2.16	96.5± 3.14 b***c***
II	Diabetic control	283.83± 28.26	272.66± 45.67	268.66± 41.41	257.66± 34.42	254.33± 31.9
III	Standard (Glibenclamide, 0.25mg/kg)	300.33± 61.55	220.5± 33.90	213.16± 35.17	178.66± 29.36	139± 17.07 b*
IV	AG 70 mg/kg (Aq)	285.83± 39.46	248.16± 31.16	231.33± 27.46	200.33± 25.76	153± 17.49 b*a***c ns
V	AG 140 mg/kg (Aq)	319.33± 43.45	297.83± 35.10	281.33± 32.76	254.66± 30.06	204± 25.60a*
VI	AG 130 mg/kg (HA)	191.166± 23.82	220± 23.17	198.33± 24.53	178.16± 22.25	132.16± 17.32 b** c ns
VII	AG 260 mg/kg (HA)	256.33± 25.79	275.33± 33.77	258.33± 32.27	235.83± 30.89	193.33± 31.35 a*, c ns

Values are Mean ± SEM (n=6) one way ANOVA followed by Tukey-Kramer's test. Where *=p<0.05, **=p<0.01, ***=p<0.001 a, b, c, d, e, f and g = Group I, Group II, Group III, Group IV, Group V, Group VI and Group VII, respectively.

Table 2: Effect of Aqueous and Hydroalcoholic Extract of Khulanjan on Postprandial Blood Glucose Level

Groups	Treatment	Postprandial Blood Sugar Level				
		0 day	7th day	14th day	21st day	28th day
I	Control (2ml/kg DW)	109.5± 5.58	124.33± 3.52	120.33± 2.45	91.83± 16.44	107.16± 4.21 b***
II	Diabetic control (STZ)	291± 30.03	291.66± 49.79	285.33± 45.08	267.83± 35.05	268.33± 28.92
III	Standard (Glibenclamide, 0.25mg/kg)	317.83± 67.61	238.33± 35.38	228.83± 35.68	195.83± 28.03	133.33± 14.53 b**
IV	AG 70 mg/kg (Aq)	303± 37.41	251.16± 31.65	243.16± 31.05	220.66± 27.92	169.33± 20.21 b* a, c ns
V	AG 140 mg/kg (Aq)	349.83± 46.42	313.83± 35.48	295.5± 32.50	277.5± 29.79	220± 27.85 a** c*
VI	AG 130 mg/kg (HA)	209.83± 20.27	223.83± 25.99	213.16± 24.02	200± 22.75	156.16± 18.34 b* a,c ns
VII	AG 260 mg/kg (HA)	260.5± 23.00	287.5± 31.64	274.83± 30.61	248.33± 30.27	211.83± 29.29 c*

Values are Mean ± SEM (n=6) one way ANOVA followed by Tukey-Kramer's test. Where *=p<0.05, **=p<0.01, ***=p<0.001 a, b, c, d, e, f and g = Group I, Group II, Group III, Group IV, Group V, Group VI and Group VII, respectively.

Table 3: Effect of Aqueous and Hhydroalcoholic Extract of Khulanjan on HbA1c (%)

Groups	Treatment	HbA1c level
		28th day
I	Control (2 ml DW)	5.48±0.188 b***
II	Diabetic control (STZ)	10.49±0.467
III	Standard (Glibenclamide, 0.25mg/kg	6.16±0.271 b***, g*
IV	AG 70 mg/kg (Aq)	7.08±0.365 b***
V	AG 140 mg/kg (Aq)	8.54±0.362 b**, c**
VI	AG 130 mg/kg (HA)	7.27±0.185 b***
VII	AG 260 mg/kg (HA)	7.75±0.421 b***, c*

Values are Mean ± SEM (n=6) one way ANOVA followed by Tukey-Kramer's test. Where *=p<0.05, **=p<0.01, ***=p<0.001 a, b, c, d, e, f and g = Group I, Group II, Group III, Group IV, Group V, Group VI and Group VII respectively.

Table 4: Effect of Aqueous and Hydroalcoholic Extract of Khulanjan on Liver Glycogen (mg/gm of tissue)

Groups	Treatment	HbA1c Level
		28th day
I	Control (2 ml DW)	45.17±1.317 b***
II	Diabetic control (STZ)	21.86±1.02
III	Standard (Glibenclamide, 0.25mg/kg	44.82±1.40 b***
IV	AG 70 mg/kg (Aq)	31.72±1.32 a***, b***, c***,
V	AG 140 mg/kg (Aq)	24.42±0.935 a***, c***
VI	AG 130 mg/kg (HA)	53.90±7.05 b***,c***, g***
VII	AG 260 mg/kg (HA)	22.3±0.917 a***

Values are Mean ± SEM (n=6) one way ANOVA followed by Tukey-Kramer's test. Where *=p<0.05, **=p<0.01, ***=p<0.001 a, b, c, d, e, f and g = Group I, Group II, Group III, Group IV, Group V, Group VI and Group VII, respectively.

Table 5: Effect of Khulanjan on Body Weight in Streptozotocin Induced Diabetes Mellitus in Albino Rats

Group	Treatment	Body weight in grams				
		0-day	7thday	14thday	21thday	28thday
I	Control Plain (2 ml/kg)	127.5±9.46	136.6±9.45	145.8±6.11	150.8±5.06	155.8±5.54
II	Diabetic Control (STZ)	153.3±7.49	150.8±8.20	143.3±7.92	138.3±7.03	131.6±5.57 c**
III	Standard Glibenclamide	165.8±8.70	161.6±8.23	165±6.83	169.1±6.24	175±5.62 b**
IV	AG 70 mg/kg (Aq)	188.3±6.91	185±5.47	184.1±4.72	186.6±4.59	193.3±4.41 a**, b***, e*, g***
V	AG 140 mg/kg (Aq)	155.8±4.90	151.6±4.94	153.3±4.41	155±4.65	161.6±5.27
VI	AG 130 mg/kg (HA)	158.3±6.91	157.5±8.63	157.5±7.27	165±7.30	173.3±2.76 b**, g*
VII	AG 260 mg/kg (HA)	157.5±8.34	147.5±8.73	144.1±9.61	146.6± 10.54	142.5±11.88 c*

Values are Mean ± SEM (n=6) one way ANOVA followed by Tukey-Kramer's test. Where *=p<0.05, **=p<0.01, ***=p<0.001 a, b, c, d, e, f and g = Group I, Group II, Group III, Group IV, Group V, Group VI and Group VII respectively.

Table 6: Effect of Khulanjan on Urine Sugar in Streptozotocin Induced Diabetes Mellitus

Groups	Treatment	Urine sugar
I	Plain control (2 ml /kg DW)	0
II	Diabetic control (STZ)	++++ (Brick red 2 %)
III	Standard (Glibenclamide, 0.25 mg/kg)	0
IV	AG 70 mg/kg (Aq)	0
V	AG 140 mg/kg (Aq)	++ (Yellow 1%)
VI	AG 130 mg/kg (HA)	0
VII	AG 260 mg/kg (HA)	++ (Green 0.5%)

0= Absent, Brick red ppt=large amount of reducing sugar, yellow & green ppt=Traces of reducing sugar,

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सारांश

स्ट्रेप्टोज़ोटोसिन इन्ड्यूस्ड डायबेटिक चूहों में खुलन्जान (*अल्पिनिया गैलंगा* राइज़ोम) के सत्त की एंटीहाइपरग्लाइसिमिक गतिविधि

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यूनानी चिकित्सा पद्धति में आमतौर पर अल्पिनिया गैलंगा एल. के राइज़ोम को खुलन्जान के रूप में जाना जाता है जिसका उपयोग लंबे समय से सिरदर्द, नपुंसकता, रूमेटिक दर्द, गले मे खराश और मधुमेह के उपचार के लिए किया जाता है। वर्तमान अध्ययन में स्ट्रेप्टोज़ोटोसिन इन्ड्यूस्ड डायबेटिक चूहों में उनके एंटीहाइपरग्लाइसिमिक गतिविधि के लिए इसके जलीय और हाइड्रोएल्कोहलिक सत्त की जांच की गई। इस औषधि के जलीय और हाइड्रोएल्कोहलिक सत्त की निम्न और उच्च खुराक (क्रमशः 70 व 140 मि.ग्रा./कि.ग्रा. और 130 व 260 मि.ग्रा./कि.ग्रा.) और एक जानी–मानी एंटीडायबिटिक औषधि ग्लिबेनक्लाइमाइड (0.25 मि.ग्रा./कि.ग्रा.) के प्रभाव के बीच 28 दिनों के लिए एक तुलना की गई। 0, 7वें, 14वें, 21वें और 28वें दिन खाली पेट और भोजन के बाद ब्लड शुगर की जांच की गई। 28 दिनों के बाद इन चूहों को बलि किया गया और HbA1c तथा लीवर ग्लाइकोजन के लिए रक्त की जांच की गई। शरीर के वजन और मूत्र–शर्करा पर सत्त के प्रभाव को भी देखा गया। इस औषधि के जलीय और हाइड्रोएल्कोहलिक सत्त की निम्न खुराक ने खाली पेट ($p<0.05$ और $p<0.01$) और भोजन के बाद ब्लड ग्लुकोज़ स्तर ($p<0.05$ और $p<0.01$) में महत्वपूर्ण कमी दिखाई। मधुमेह नियंत्रण (10.49±0.4670) समूह की तुलना में क्रमशः जलीय और हाइड्रोएल्कोहलिक सत्त की निम्न खुराक (7.08±0.3650 and 7.27±0.1858) और हाइड्रोएल्कोहलिक सत्त की उच्च खुराक (7.75±0.4216) में HbA1c एक महत्वपूर्ण स्तर तक कम हो गया। हाइड्रोएल्कोहलिक सत्त की निम्न खुराक ने भी लीवर ग्लाइकोजन (53.90±7.051) में उल्लेखनीय वृद्धि दिखाई। अध्ययन से पता चला कि परीक्षण औषधि में एंटीहाइपरग्लाइसिमिक गतिविधि मौजूद होती है।

शब्दकुंजी – अल्पिनिया गैलंगा, एंटीहाइपरग्लाइसिमिक गतिविधि, मधुमेह, खुलन्जान, स्ट्रेप्टोज़ोटोकिन

Clinical Evaluation of Unani Pharmacopoeial Formulation *Raughan Ikseer* in *Waja-al-Asnan* (Toothache)

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Abstract

Waja-al-Asnan (Toothache) is defined as pain in teeth. According to Unani concept, *Waja-al-Asnan* (Toothache) is caused by *Su-i-Mizaj Harr* (Hot impaired temperament), generally *Maddi*, inflammation of gums and *Su-i-Mizaj Barid* (Cold impaired temperament) of tooth or its nerve. Toothache may occur at any age, either in gender or any geographic region. In the United States, an estimated 12% of the general population reported to have suffered from toothache at some point of time in the six months before questioning. There is a general perception that Unani treatment provides relief in chronic diseases and has nothing to offer relief in acute diseases as compared to allopathic treatment. However, this is absolutely incorrect and there are certain Unani formulations which can provide instant symptomatic relief in acute diseases. Keeping this in view, the study drug *"Raughan Ikseer"* was selected for clinical validation in *Waja-al-Asnan* (Toothache).

Keywords: Pain, Pulpitis, *Raughan Ikseer, Temperament, Waja-al-Asnan.*

Introduction

Waja'al-Asnan (Toothache) is defined as pain in teeth. Unani physicians believed that teeth have no nerve supply as these are made up of bone and bones don't have nerve supply. But according to Jalinus (Galen), teeth have also nerve supply and this was supported by Ibn sina (Avicenna) and other medieval physicians also. Toothache may occur at any age either in gender or any geographic region. Diagnosing and relieving toothache is considered as one of the main responsibilities of dentists (Wolf & Ramesier, 2012).

A tooth is composed of an outer shell of calcified hard tissues (from hardest to softest: enamel, dentin and cementum) and an inner soft tissue core (the pulp system) which contains nerves and blood vessels (Kumar, 2004). Enamel is not a vital tissue, as it lacks blood vessels, nerves and living cells. Consequently, pathologic processes involving only enamel, such as shallow cavities or cracks, tend to be painless (Napenas, 2013). Dentin contains many microscopic tubes containing fluid and the processes of odontoblast cells which communicate with the pulp. Mechanical, osmotic or other stimuli causes movement of this fluid, triggering nerves in the pulp (the hydrodynamic theory of pulp sensitivity) (Petersson, 2013). Pain is an unpleasant sensation caused by intense or damaging events. In a toothache, nerves are stimulated by either exogenous sources (for instance, bacterial toxins, metabolic byproducts, chemicals, or

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trauma) or endogenous factors (such as inflammatory mediators) (Hargreaves et al, 2011). The pain pathway is mostly transmitted via myelinated Aδ (sharp or stabbing pain) and unmyelinated C nerve fibers (slow, dull, aching or burning pain) of the trigeminal nerve which supplies sensation to the teeth and gums via many divisions and branches (Napenas, 2013). Tooth has a cavity which is filled with pulp (soft tissue) which has nerve supply. Common causes of toothache include inflammation of the pulp, usually in response to tooth decay, dental trauma or other factors, dentin hypersensitivity, apical periodontitis (inflammation of the periodontal ligament and alveolar bone around the root apex), dental abscesses (localized collections of pus, alveolar osteitis ("dry socket", a possible complication of tooth extraction), acute necrotizing ulcerative gingivitis (a gum infection), temporomandibular disorder. Pulpitis is reversible when the pain is mild to moderate and lasts for a short time after a stimulus (for instance cold) or irreversible when the pain is severe, spontaneous and lasts a long time after a stimulus. Left untreated, pulpitis may become irreversible, then progress to pulp necrosis (death of the pulp) and apical periodontitis. Abscesses usually cause throbbing pain. Proper oral hygiene helps to prevent toothaches by preventing dental disease. The treatment of a toothache depends upon the exact cause and may involve a filling, root canal treatment, extraction, drainage of pus or other remedial action. The relief of toothache is considered as one of the main responsibilities of dentists (Wolf et al, 2012).

Irreversible pulpitis is thought to be the most common reason that people seek emergency dental treatment (Fedorowicz et al, 2013). Dental caries associated with pulpitis is the most common cause of toothache and more common in people who are at higher risk of dental caries. The prevalence of caries in a population is dependent upon factors such as diet (Refined sugars), socioeconomic status and exposure to fluoride (such as areas without water fluoridation) (Zakrzewska, 2009). In the United States, an estimated 12% of the general population reported to have suffered from toothache at some point of time in the six months before questioning (Hargreaves, 2011). Individuals aged 18-34 reported much more experience of toothache than those aged 75 years or above. In a survey of Australian school children, 12% had experienced toothache before the age of five years and 35% by the age of 12 years (Zakrzewsika, 2009). Dental trauma is extremely common and tends to occur more often in children than in adults (Douglass & Douglass, 2003).

According to Unani concept, *Waja ' al-Asnan* (Toothache) is caused by *Su-i-Mizaj Harr* (Hot impaired temperament), generally Maddi, inflammation of gums and

Su-i-Mizaj Barid (Cold impaired temperament) of tooth or its nerve. *Tasawwus al-Asnan* (Dental caries) is also an important cause of pain. *Madda Damwiyya* (sanguine matter) and *Bukharat Balghamiyya* (Phlegmatic gases) are also responsible for toothache. Other causes of *Waja 'al-Asnan* (Toothache) include excess of *Safra* (Yellow bile) and *Balgham* (Phlegm), lack of oral hygiene, indigestion, gout, use of drugs containing mercury, excessive use of sweet and sour foods, cold and coryza, pregnancy and accumulation of putrefied humours in the stomach. In case of *Su-i- Mizaj Harr* (Hot impaired temperament), cold water or cold beverages relieve the pain, gums are inflamed while in case of *Su –i- Mizaj Barid* (Cold impaired temperament), cold water and cold things increases the pain and hot water and hot beverages relieve the pain and there is no inflammation of gums. When there will be *Su-i- Mizaj Harr Maddi*, symptoms of *Ghalba-e- Khilt Haar* like *Safra* or *Dam* will be accompanied by toothache and when there will be *Su-i- Mizaj Baarid Maddi*, symptoms of *Ghalba-e- Khilt Barid* like *Balgham* will be present with toothache, as per the assessment of *Mizaj* by Unani parameters (*Ajnaas-e-Ashra*).

Principles of treatment of *Waja 'al-Asnan* (Toothache) include *Ta'dil Mizaj* and *Taskin Dard* along with proper management of actual cause of pain. In Unani system of medicine, drugs of local applications are generally used to relieve pain. These drugs are applied locally to affected tooth in various forms such as Sunun (Tooth powder), *Mazmaza* (Mouth wash) and *Duhn* (oil). Local application of opium, common salt, vinegar, *Ajwayin Khurasani, Raughan Qaranafal* (Clove oil) and *Araq Ajeeb* is used to relieve pain (Khan, 1987; Al-Qamari, 2008; Arzani, 1988; Kabeeruddin, 2007; Majusi, 2010; Tabari, 2010). The fast-acting Unani pharmacopoeial formulation – *Raughan Ikseer* (Anonymous, 2011) has been identified for the purpose and validated on scientific parameters in order to generate data regarding its safety and efficacy.

The objective of the study is to assess the safety and efficacy of Unani Pharmacopoeial formulation *Raughan Ikseer* in case of *Waja-al-Asnan* (Toothache).

Material and Methods

The study was designed as an open clinical trial to evaluate the efficacy of Unani pharmacopoeial formulation *Raughan Ikseer* on 32 patients of *Waja 'al-Asnan* (Toothache). The patients were treated for a period of one week with a regular follow-up on 3rd day and 7th day of treatment at Regional Research Centre

(Unani), Silchar. The duration of the protocol therapy was one week. The patients were enrolled in the study as per the inclusion criteria and *Mizaj* were assessed on the basis of *Ajnaas-e-Ashra* proforma designed for the purpose.

Treatment Details

Table 1: Study Drug Raughan Ikseer

S. No.	Study Drug	Form	Route of Administration	Dose	Frequency	Instructions
1.	*Raughan Ikseer*	Oil	Local Application	Q.S.	Twice daily	Soak a cotton swab in the oil and apply gently to the aching tooth.

Table 2 : Composition of Raughan Ikseer

S. No.	Unani Name	Botanical Name	Weight
1.	Kafoor Khalis	*Cinnamomum camphora*	25g
2.	Sat-e-Pudina	*Mentha arvensis*	10g
3.	Sat-e- Ajwayin	*Trachyspermum ammi*	10g

Dosage and Administration

All the patients were selected as per inclusion and exclusion criteria of *Waja 'al-Asnan* (Toothache). Unani Pharmacopoeial Drug *Raughan Ikseer* (Oil) was applied locally as mentioned in Table 1. No concomitant treatment was given.

Place of Study

The present open level study was carried out after obtaining the approval of Institutional Ethics Committee of RRC (U), Silchar in the patients attending the GOPD at Regional Research Centre (Unani), Silchar (Assam).

Selection of Patients

The patients were selected on the basis of inclusion and exclusion criteria as given below:

Inclusion Criteria

- Patients of either sex in the age group of 18-65 years.
- Patients having *Waja'al-Asnan* (Toothache) with or without any of the following symptoms:

- *Waram al-Lisa* (Gingival swelling)
- *Humra al-Lisa* (Gingival erythema)
- *Nazf al-Lisa* (Gingival bleeding)
- *Hassasiyat Harariyya* (Thermal sensitivity) – Pain triggered by Cold or Heat
- *Suda* (Headache)

Exclusion Criteria

- Toothache does not respond to standard therapy.
- Toothache accompanied by impaired neurological functions (loss of balance, weakness, numbness or speech disturbances), double vision, seizures, mental disturbances and loss of consciousness.
- Toothache accompanied by persistent nausea, vomiting, fever and stiff neck.
- Presence of a periodontal abscess as diagnosed by clinical examination of the painful tooth.
- Presence of concomitant oral pain due to any other condition such as soft-tissue lesions (e.g., aphthous/traumatic ulcer, herpes labialis, acute necrotizing ulcerative gingivitis) or multiple hard-tissue (e.g. carious) lesions; pain due to other surgical procedures, injuries or dental surface sensitivity.
- Known cases of any other acute illness.
- Known cases of severe Renal/Hepatic/Cardiac ailments.
- Pregnant and lactating women.
- History of Hypersensitivity to the study drug or any of its ingredients.
- History of addiction (alcohol, drugs)

Safety Assessment

- The safety was monitored on the basis of the laboratory investigations viz. CBC (Hb%, TLC, DLC, ESR) LFT (S. Bilirubin, SGOT, SGPT, S. Alkanine Phosphatase), KFT (S. Urea, S. Creatinine, Uric Acid) and Urine R/M done at the baseline and end of the study and Blood Glucose (Fasting) was carried out only at the baseline.
- The safety of the drug was also assessed clinically on the basis of adverse events as reported by the patients or observed clinically on the follow-up. No adverse effect of the Unani Pharmacopoeial drug *Raughan Ikseer* was observed during the course of the study and at the end of the study so the drug was found safe in the patients of *Waja 'al-Asnan* (Toothache).

Efficacy Assessment

The patients were assessed clinically on 3rd and 7th day of the treatment and the efficacy of the Unani Pharmacopoeial drug *Raughan Ikseer* was evaluated on the basis of reduction in the sign and symptoms as mentioned in the Case Record Form. The severity of symptoms was recorded in number as per the Visual Analogue Scale (VAS).

Statistical Analysis

Clinical subjective parameters, pathological and biochemical parameters were statistically analyzed using student's 't' test and paired 't' test. The results were expressed as Mean ± SEM. $P<0.05$ has been considered as statistically significant and $P<0.001$ has been considered as statistically highly significant.

Results and Discussion

Toothache is the pain in the teeth or their supporting structures caused by dental diseases or pain referred to the teeth by non-dental diseases. When it is severe, it may impact sleep, eating and other daily activities. In the United States, an estimated 12% of the general population reported to have suffered from toothache at some point of time in the six months before questioning (Hargreaves, 2011). Individuals aged 18-34 years reported much more experience of toothache than those aged 75 years or above. In a survey of Australian school children, 12% had experienced toothache before the age of five years and 35% by the age of 12 years (Zakrzewsika, 2009). Dental trauma is extremely common and tends to occur more often in children than in adults (Douglass & Douglass, 2003).

In Unani Medicine, principles of treatment of *Waja 'al-Asnan* (Toothache) include *Ta'dil Mizaj* and *Taskin Dard* along with proper management of actual cause of pain. In the present study, toothache patients were prescribed local application of *Raughan Ikseer*. The main aim of the study was to provide symptomatic relief in toothache irrespective of humours domination. *Raughan Ikseer* contains *Kafoor Khalis, Sat-e-Pudina* and *Sat-e- Ajwayin* as constituents. *Kafoor* shows *Daf-e-Taaffun* (Antiseptic), *Mukhaddir* (Anesthetic) (Kabeeruddin, 1937) and *Musakkin Alam* (Analgesic) activity (Kabeeruddin,1937 and Khare, 2007). *Sat-e- Ajwayin* shows *Musakkin* (Sedative) (Kabeeruddin, 1937) and *Daf-e-Taaffun* (Antiseptic) activity (Anonymous, 2009 and Kabeeruddin, 1937). *Sat-e-Pudina* possesses *Musakkin Dard / Daf-e-Dard* (Analgesic) (Anonymous, 2008, Kabeeruddin, 1937 and Ghani, 2005) and *Daf-e-Taaffun* (Antiseptic) activity (Anonymous, 2008). In

this study *Raughan-e-Ikseer* provides relief in toothache by *Musakkine Dard, Mukhaddir* and *Daf-e-Taaffun* properties. A pharmacopoeial drug *Araq-e-Ajeeb* containing similar ingredients (*Kafoor, Sat-e-Pudina* and *Sat-e- Ajwayin*) also shows *Musakkin-e-Alam* (Analgesic) activity (Anonymous, 2009).

In the present study, maximum number of patients belonged to the age group of 18-30 years (43.75%) followed by 31-40 years (28.13%). Both male and female were in equal proportion, 50% each (Tables 3 and 4).

Table 3 : Age-wise Distribution of the Cases

S. No.	Age group (in years)	No. of cases (32)	Percentage
1	18-30	14	43.75
2	31-40	9	28.13
3	41-50	5	15.62
4	51-60	3	9.38
5	≥ 60	1	3.12
Total	**0**	**32**	**100**

Table 4 : Sex-wise Distribution of the Cases

S. No.	Sex	No. of Case (32)	Percentage
1	Male	16	50%
2	Female	16	50%
	Total	**32**	**100**

In this study, maximum number of patients were Damwi mizaj (50.00%) followed by Balghami (28.13%) and Safravi (21.87%) mizaj (Table 5).

Table 5 : Distribution of the Cases According to Mizaj (Temperament)

S. No.	Temperament (Mizaj)	No. of Cases (32)	Percentage
1	Sanguine (Damwi)	16	50.00
2	Phlegmatic (Balghami)	9	28.13
3	Bilious (Safravi)	7	21.87
4	Melancholic (Saudavi)	0	0
	Total	**32**	**100**

In the present study, efficacy of *Raughan Ikseer* was evaluated over a period of seven days on the basis of symptom-wise improvement. The mean scores of *Waja-al-Asnan* (Toothache), *Waram-al-Lisa* (Gingival swelling), *Humra-al-Lisa* (Gingival erythema), *Nazf-al-Lisa* (Gingival bleeding), *Hassasiyat Harariyya* (Thermal Sensitivity) Pain triggered by Cold / Heat and *Suda* (Headache) before treatment were 7.06, 1.91, 0.75, 0.69, 5.84 and 3.03 respectively while

after treatment they were 1.63, 0.44, 0.25, 0.06, 2.50 and 1.00 respectively. So the improvement in Toothache, Gingival swelling, Gingival erythema, Gingival bleeding, Thermal Sensitivity and Headache were 76.91%, 76.96%, 66.67%, 91.30%, 57.19% and 67.00% respectively which were statistically significant (Table 6 and Figure 1).

Table 6 : Effect of Unani Pharmacopoeial Formulation, *Raughan Ikseer* on Different Symptoms Associated with *Waja-al-Asnan* (Toothache)

S. No.	Signs and Symptoms	Before Treatment	1st Follow Up	After Treatment	Improvement
		Mean±SD	Mean±SD	Mean±SD	
1	Waja-al-Asnan (Toothache)	7.06±0.18	3.50±0.10	1.63±0.26*	76.91 %
2	Waram-al-Lisa (Gingival swelling)	1.91±0.45	0.75±0.17	0.44±0.17*	76.96 %
3	Humra-al-Lisa (Gingival erythema)	0.75±0.27	0.00±0.00	0.25±0.15*	66.67 %
4	Nazf-al-Lisa (Gingival bleeding)	0.69±0.27	0.00±0.00	0.06±0.06*	91.30 %
5	Hassasiyat Harariyya (Thermal Sensitivity) Pain triggered by Cold / Heat	5.84±0.44	3.00±0.38	2.50±0.30*	57.19 %
6	Suda (Headache)	3.03±0.40	1.25±0.33	1.00±0.21	67.00 %

* The mean values are significantly different (P<0.05)

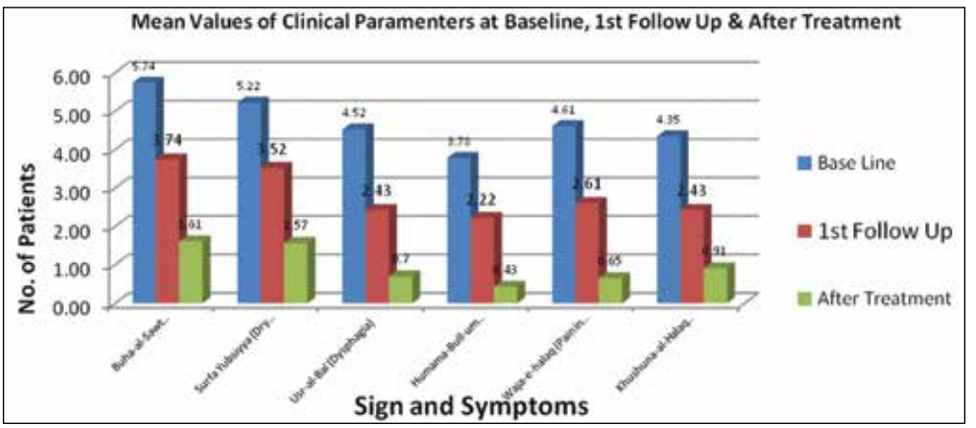

Fig. 1 : Effect of Unani pharmacopoeial formulation, *Raughan Ikseer* on different symptoms associated with *Waja-al-Asnan* (Toothache).

Thirty two cases completed the study, out of them four cases (12.50%) were cured, twenty (62.50%) relieved and eight (25.00%) partially relieved whereas no case reported to have no relief (Table 7 and Figure 2).

Table 7: General Therapeutic Response

S. No.		Cured (90-100)%	Relieved (60-89)%	Partially Relieved (30-59)%	Not Relieved (0-30)%	Total
1	No. of Cases	4	20	8	0	32
2	Percentage	12.50	62.50	25.00	0	100.00

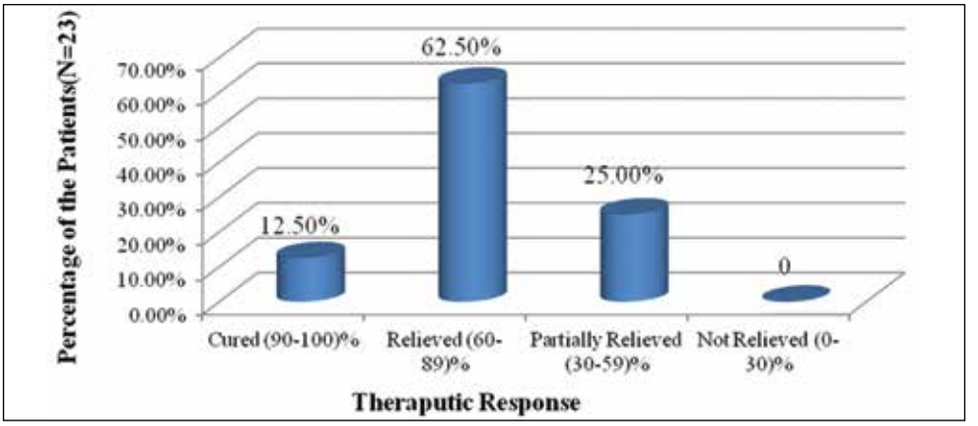

Fig. 2 : General Therapeutic Response

No any change was found in TLC, DLC, Neutrophils, Lymphocytes and Monocytes at the baseline and after the treatment. Results suggest that the Unani classical drug may be useful as a potent drug for the symptomatic relief in Waja-al-Asnan. At the baseline ESR was high which was significantly reduced after treatment with Unani classical drug ($P<0.05$). Results are shown in Tables 8 & 9. The drug was found safe at the given dosage schedule as no adverse result was reported in the pathological and biochemical parameters of the study.

Table 8 : Hb, ESR and TLC at the Baseline and After the Treatment

S. No.	Investigation		Baseline	After Treatment
			Mean±S.E.M	Mean±S.E.M
1	Hemoglobin (Hb) (gm%)		11.41±0.25	12.04±0.19*
2	Erythrocyte Sedimentation Rate (ESR) (mm/hr)	1st Hour	27.22±2.47	16.94±1.15*
3	Total Leucocyte Count (TLC) (cmm)		7412.50±129.11	7453.13±79.65**

* The mean value is significantly different ($P<0.05$)

** The mean values are not significantly different ($P>0.05$)

Table 9 : DLC at the Baseline and After the Treatment

S. No.	Investigation	Baseline	After Treatment
		Mean±S.E.M	Mean±S.E.M
1	Neutrophils (%)	58.31±1.01	60.66±0.85**
2	Lymphocytes (%)	37.81±0.98	35.66±0.80**
3	Eosinophils (%)	2.59±0.21	2.19±0.07**
4	Monocytes (%)	1.28±0.08	1.50±0.09**

** The mean values are not significantly different (P<0.05)

Conclusion

On the basis of the above observations, it can be concluded that Unani pharmacopoeial formulation Raughan Ikseer is effective in the treatment of Waja-al-Asnan (Toothache). Moreover, the drug is cheaper, easily available and well tolerated by the patients without having any side effect.

Acknowledgement

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सारांश

वजा-अल-असनान (दांत दर्द) में यूनानी भेषजकोशीय मिश्रण रोग़न इकसीर का नैदानिक मूल्यांकन

*[1]मो. मसीहुज़्ज़मां अंसारी, [1]अख़्तर हुसैन जमाली, [2]मुस्तेहसन, [1]उज़मा सिद्दीक़ी और [1]मो. आमिर

वजा–अल–असनान (दांत दर्द) को दांत के दर्द के रूप में परिभाषित किया गया है। यूनानी सिद्धान्तों के अनुसार वजा–अल–असनान (दांत दर्द) दांत या इसकी नसों में सु–ए–मिज़ाज हार (हॉट इम्पेयर्ड टेम्परामेन्ट) सामान्यतः माद्दी, मसूड़ो में सूजन, सु–ए–मिज़ाज बारिद (कोल्ड इम्पेयर्ड टेम्परामेन्ट) के कारण होता है। दांत दर्द किसी भी उम्र में या लिंग या भोगौलिक क्षेत्र में हो सकता है। संयुक्त राज्य अमेरिका में लोगों से पूछे जाने पर सामान्य जनसंख्या में से 12 प्रतिशत लोगों ने पिछले छः महीने में दांत दर्द की समस्या को स्वीकार किया। एक आम धारणा है कि यूनानी उपचार से जटिल रोगों में राहत मिलती है और एलोपैथिक उपचार की तुलना में तीव्र रोगों के उपचार के लिए यूनानी में कुछ नहीं है। हालांकि यह बिल्कुल गलत है और कुछ यूनानी मिश्रण हैं जो प्रखर रोगों में तुरंत राहत प्रदान कर सकते हैं। इस बात को ध्यान में रखते हुए वजा–अल–असनान (दांत दर्द) में नैदानिक वैधीकरण हेतु औषधि "रोग़न इक्सीर" का चयन किया गया।

शब्दकुंजीः दर्द, पलपाईट्स, रोग़न इक्सीर, मिज़ाज, वजा–अल–असनान।

Evaluation of Market Samples of *Duqu* with Reference to Standardization

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Abstract

Controversy, substitution and adulteration are the major impediments for wide acceptability of herbal drugs. The above tribulations have a triangular relationship as controversy leads to substitution which in turn favors adulteration and *vice versa*. On account of these problems, the present study has been undertaken for evaluation of *Duqu*, an important Unani drug which is said to be contentious with reference to literature, market survey and Pharmacognostic studies for its standardization. Findings of the literature survey gave confusing outcome. In general, a number of plants have been referred to as the source of *Duqu*, however, in most of the literature, *Duqu* is equated with wild carrot (*Peucedenum grande* CB Clarke) seeds.

Keywords: Adulteration, *Duqu*, Parameter, *Shaqaqul*, Standardization

Introduction

In earlier days, Unani physicians had a lot of survey work, thus, they had substantial knowledge about identity of herbs. But, today's physicians rely on the clemency of the traders who are often laymen and least bothered about the identity of crude drugs. Literature survey has revealed a number of herbal drugs to be controversial, adulterated or substituted (Sitholey, 1994). Adulteration in crude drugs affects the promotion of herbal products. Novel methods of adulteration adopted by the traders are often difficult to trace without advanced studies (Kamboj, 2012; Afaq, 1994). Adulteration due to the confused vernacular names of drugs and online incomplete information add further problems (Qadri and Hamid, 1962).The drug's origin is the common type of controversy and problem reported by Ansari (1992). The market samples of herbal drugs were found substituted when evaluated on scientific parameters (Evans, 2008; Kokate *et al.*, 2005). Appropriate strategies may be made compulsory in order to homogenize drugs' samples (Afaq, 1994; Evans, 2008; Kokate *et al.*, 2005).

Survey may be instrumental for the solution of controversy. A comparison of classical and ethnobotanical literature pertaining to a drug may give improved results than one alone. Literature survey may be good enough to add information. Field survey is most significant, as one can reach the original source of a drug. Problem of *Kundur* was solved through field survey (Siddiqui, 1982). Under market survey, samples of a drug are procured from different markets and compared with the original sample. Pharmacognosy, on the other hand, can help in standardization of crude drugs (Evans, 2008).Analytical techniques, such as chromatography, spectrophotometry, etc. can be used in standardization of herbal material successfully (Shinde and Dhalwal, 2007).

In Unani Medicine, *Duqu* is considered as a debated drug. Though, most of the Unani authors and some ethnobotanists consider fruit/seed of the plant as

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wild carrot seed and the only part used therapeutically (Khare, 2007; Nadkarni and Nadkarni, 2009; Kritikar and Basu, 2007; Anonymous, 2007; Dymock *et al.*, 2005; Anonymous, 2004; Anonymous, 1987; Saeed, 1997; Chatterjee and Pakrashi, 2003) and some authors have confused *Shaqaqul*, a different drug, as root of *Duqu* (Jurjani, 2010). Nonetheless, in some ethnobotanical literature, root of *Pastinaca secacul* L. is mentioned as *Shaqaqul* (Anonymous, 2007; Khare, 2007) and *P. grande* as *Duqu*. In addition, some other plants mainly those of family Apiaceae have also been confused with *Duqu*.

Material and Methods

Materials

Two samples under the name of *Duqu* were procured from herbal drug market of Delhi and Bangalore and named as A and B respectively. One sample was collected from natural source in Sri Tirtha Rameshwara hillock, Davangere, Karnataka, which was considered as standard and designated as C. These two market samples were identified by Dr. Noorunnisa Begum S., Senior Assistant Professor, FRLHT, Bengaluru vide authentication certificate No.3821, 3823. Voucher specimens of all the samples were deposited in the drug museum of National Institute of Unani Medicine, Bengaluru.

Methods

Literature survey

Classical Unani literature, ethnobotanical books and other reliable sources were reviewed for the source, vernaculars, controversy, actions and uses of *Duqu*.

Organolepti Evaluation

The organoleptic characters of all the three samples were examined.

Physico-chemical Studies

Ash vales were estimated by the method described in Medicinal Plants of India (Anonymous, 1987). Moisture content was determined by the loss on drying method of Khandelwal (2008). pH of 1% and 10% aqueous solution was measured with pH meter (Anonymous, 1987; Khandelwal, 2008). Solubility and extractive values were estimated by the method mentioned in British Pharmacopoeia (Anonymous, 1968). Fluorescence analysis of the powder was done as per the method of Kokoshi *et al.* (1958). For preliminary Phytochemical studies, the powdered drug was extracted in different organic solvents as per the methods mentioned in various books and papers (Anonymous, 1987, Khandelwal, 2008; Paech and Tracey, 1955; Pandey and Tripathi, 2013; Bhattacharjee and Das, 1969; Sanmugarajah *et al.*, 2013).

Spectrophotometry

Spectrophotometry was performed by UV-Vis Spectrophotometer; model Lab India 3000. Extracts were analyzed against blank sample for wavelength ranging (360-190nm).UV-Vis spectrophotometer was assessed to spectrum scanning mode. The parameter was set and dark current correction was performed to ensure the accuracy of the measurement results. Baseline correction was performed with the sample control cell and then sample of drug was analyzed. Peak picking was done by threshold value. The observations were saved to note absorbance against particular wavelength and number of peaks.

Results and Discussion

In most of the literature, it was mentioned that *Duqu* a plant different from *Shaqaqul*. Ethnobotanical literature revealed *Duqu* as *P. grande*. Results of physical studies are shown in Tables 1-4 and Figures 1-3. Preliminary phytochemical screening showed the presence of carbohydrates, glycosides, terpenes, phenols, flavonoids, coumarins, sulphates, iron, phosphates, chloride and nitrates in all the three samples. Spectrum scanning of Petroleum ether, ethanol and aqueous extracts showed peaks of varied absorbance.

Reasons for controversy and adulteration are many. Multilingual nomenclature of drugs and regional effects are important reasons. For example, *Shaqaqul Misri* has been named as *Satavar* and *Safed Musli* in Hindi, *Safed Musli* in Marathi, *Shadavo* in Tamil and *Shatavari* in Telugu (Anonymous, 2007). *Asparagus racemosus* Willd. has been mentioned as *Shaqaqul* and *Satavar* in some areas (Nadkarni and Nadkarni, 2009; Kritikar and Basu, 2007; Anonymous, 2004; Anonymous, 2007). Botanical name of *Shaqaqul* is mentioned as *Asparagus adcendens* (Anonymous, 2007). *P. grande., P. secacul* and *A. racemosus* have been confused in spite of the fact that *A. racemosus* is a familiar name of *Satawar. P. secacul* has been confused with it (Anonymous, 2007; Nadkarni and Nadkarni, 2009; Kritikar and Basu, 2007; Anonymous, 2004). Some authors have equated *Shaqaqul* with wild carrot root (Anonymous, 2007; Sina, 1998). In Unani medicine too, *Duqu* has been confused with *Shaqaqul*. However, some authors have considered *Shaqaqul* as a different plant (Khare, 2007, Dymock *et al.*, 2005). Most of the authors have described *P. grande* as the botanical name of *Duqu* (Khare, 2007; Nadkarni and Nadkarni, 2009; Kritikar and Basu, 2007; Anonymous, 2007, Dymock *et al.*, 2005; Anonymous, 2004). It may be because of regional effect, as *Shaqaqul* is an exotic drug and it is possible that *A. racemosus* might have been sold as *Shaqaqul* in Indian markets. The Unani Pharmacopoeia of India has mentioned *P astinacasecacul* L. as the source of *Shaqaqul* and *Satavar* (Anonymous, 2007). In some books *A. racemosus* is botanical name of *Shaqaqul* and *Satavar* (Saeed, 1997; Wahid and Siddiqui, 1961). In some modern literature, *Shaqaqul* has been named as *P. secacul* as well as *A. racemosus*. (Khare, 2007; Nadkarni and Nadkarni, 2009; Kritikar and Basu, 2007; Anonymous, 2004).

Sina (1998) has mentioned *Shaqaqul* as a type of carrot which cannot be confused with *Satavar*. Dioscorides has mentioned three types of carrot but he did not mention about *Duqu* (Baitar, 2000). Ibn Baitar (2000) has mentioned about a drug known as *Doucus* whose morphology is very much similar to carrot as mentioned by Dioscorides. He has also mentioned *Shaqaqul* as different drug. *Duqu* has also been mentioned as seeds of wild carrot and its root as *Shaqaqul* (Jurjani 2010, Khan 2013).

Market survey is another way to solve controversies. In this study, two market samples differed from each other. One sample was identified as *P. grande* and the other one as a *Anethum* spp. Phytochemistry may differentiate these two plants but in this study all samples showed similar constituents. Since, the phyto-constituent found in this study is common in the plants of Umbelliferae family; therefore, phytochemistry was of not much help to draw concrete conclusion.

All the samples were examined for shape, size, color, odor, taste and surface and sample B differed from A and C. Therefore, it seemed to be a different plant. Sample A and C seemed to be part of the same plant. Physicochemical studies, fluorescence analysis and Spectrophotometry were considered suitable parameters in this study. Ash value, especially acid insoluble ash, is a good parameter for detecting adulteration. This parameter also showed sample B is different from A and C. By detecting pH of a solution of a substance at 1% w/v and 10% w/v of water, purity of drug can be checked. In this study, the pH of sample B differed from samples A and C. The mean percentage value of water soluble content was found to be 28.71, 16.10 and 23.39 for samples A, B and C, respectively (Table 2). This test also proved that sample B is different from A and C. Extractive value is the amount of extract in a particular solvent which is an important parameter. This parameter also revealed sample B is different from A and C.

Keeping Fluorescence analysis in mind as a good indicator of standardization, it was applied in this study. This parameter also showed sample B is different from A and C.

Preliminary Phytochemical studies are more reliable than physical parameters. These tests show the presence and absence of various active phytoconstituents like alkaloids, glycosides etc. when various tests are applied. In certain cases a particular test shows negative results but the same shows positive results when other test is applied. It happened in this study. Since, all the samples belonged to Umbelliferae family; it is likely that Phytochemicals will be common to all.

Spectrophotometry may be applied for more conclusive results. In this study, extracts were analyzed against blank sample; therefore, it could get only peaks and valleys. The number of peaks and their wavelengths gave a rough idea with minor differences. Due to a common family for all samples, B was not odd one as shown by other tests.

Conclusion

The study highlighted that different samples of *Duqu* are sold in the market. Botanically, *Duqu* is *P. grande*. Therefore, it should not be equated with *Shaqaqul* or other Umbelliferous plants. The results may be considered as standard. However, further study with many market samples of *Duqu* is needed to corroborate exact market scenario.

Table 1: Organoleptic Evaluation of Different Samples of *Duqu*

Characteristics	Samples		
	Sample A	Sample B	Sample C
Shape	Obovate	Oval	Obovate
Size	10-13mm long	3-4mm	10-13mm long
Colour	Yellowish brown	Brown	Dark Yellowish brown
Odour	Lemon like	Aromatic	Lemon like
Taste	Bitter	Aromatic and Spicy	Bitter
Surface	Longitudinal ridges	Longitudinally striated surface	Longitudinal

Table 2: Physical Parameters of Different Samples of *Duqu*

Parameters	Samples		
	A	B	C
Total ash	9.2±1.01	6.47±0.81	11.23±0.78
Acid insoluble ash	2.594±1.046	0.63±0.21	3.08±1.08
Water soluble ash	5.06±0.73	1.547±0.16	3.09±0.78
Moister content	12.34±2.4	7.98±1.26	14.07±0.68
pH at 1%	5.74±0.07	6.11±0.29	5.52±0.13
pH at 10%	5.28±0.30	5.69±0.51	5.21±0.09
Solubility	28.71±0.51	16.10±1.40	23.39±0.81

Table 3: Extractive Values of Various Samples of *Duqu*

Solvents	Samples		
	A	B	C
Petroleum ether	5.70±0.55	22.17±0.55	13.75±0.55
Benzene	1.700±0.62	4.022±2.46	4.49±1.23
Acetone	1.64±0.55	4.02±2.46	4.49±1.23
Ethanol	4.19±0.62	3.22±24.62	3.46±24.62
Water	24.88±2.87	11.006±2.13	23.76±2.21

Table 4: Fluorescence Analysis of Different Samples of *Duqu*

Treatment	Day light			U.V. light		
	Samples			Samples		
	A	B	C	A	B	C
Powdered drug+1N HCL	Brownish yellow	Dark brown	Yellowish green	Dark greenish yellow	Dark greenish brown	Greenish yellow
Powdered drug +1N NaOH	Yellow	Brown	Yellow	Greenish yellow	Light yellowish green	Greenish
Powdered drug +50% HCl	Brownish yellow	Brown	Yellow	Greenish yellow	Greenish brown	Brownish yellow
Powdered drug +50% H2SO4	Yellowish brown	Reddish brown	Reddish brown	Dark greenish yellow	Dark greenish brown	Greenish brown
Powdered drug +50% HNO3	Brown	Reddish brown	Brown	Pale Yellowish brown	Yellowish brown	Greenish yellow
Powdered drug +Methanol	Pale brown	Pale brown	Pale brown	Light Yellowish brown	Pale brown	Pale yellowish brown
Powdered drug+1N NaOH	Yellow	Brown	Yellow	Greenish yellow	Greenish yellow	Greenish yellow

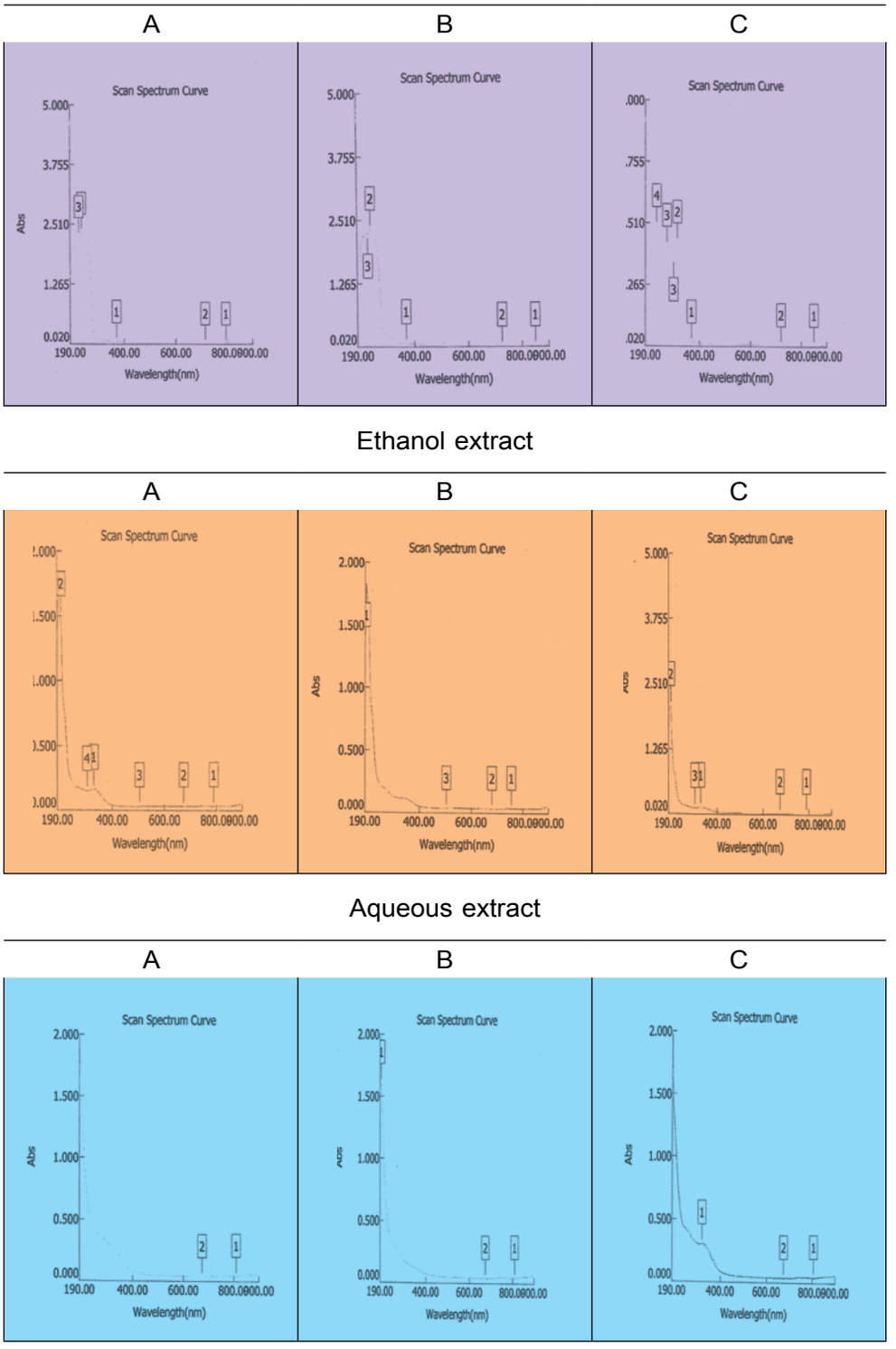
A B C

Fig. 1: Different samples of *Duqu*

Shaqaqul Satavar

Fig. 2: Market Samples of *Shaqaqul* and *Satavar*

Fig. 3: Spectrophotometry (Spectrum scanning)



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सारांश

मानकीकरण के सन्दर्भ में दुकु के मार्केट नमूनों का मूल्यांकन

हिना परवीन, *अब्दुल वदूद, शाइस्ता परवीन और हक़ीक़ अहमद

हर्बल औषधियों की व्यापक स्वीकार्यता के लिए विवाद, प्रतिस्थापन और मिलावट प्रमुख बाधाएं हैं। उपर्युक्त बाधाओं का एक त्रिकोणीय संबंध है क्योंकि विवाद से प्रतिस्थापन होता है जिसके परिणामस्वरूप मिलावट होती है और इसी प्रकार इसका उल्टा होता है। इन समस्याओं को ध्यान में रखते हुए दुकु के मूल्यांकन के लिए वर्तमान अध्ययन किया गया जोकि एक महत्वपूर्ण औषधि है जिसे इसके मानकीकरण के लिए साहित्य, बाजार सर्वेक्षण और फार्माकोनोजिनेटिक अध्ययनों के संदर्भ में विवादास्पद कहा गया है। साहित्य सर्वेक्षण के निष्कर्ष से भ्रामक परिणाम मिले। सामान्यतः कई पौधों को दुकु के स्रोत के रूप में संदर्भित किया गया था यद्यपि अधिकांश साहित्य में दुकु को जंगली गाजर (पीयूसिडेनम ग्रैंड सीबी क्लार्क) के बीजों के समान माना गया है।

शब्दकुंजीः मिलावट, दुकु, मापदंड, शक़ाकुल, मानकीकरण

Clinical Observation of Unani Drug Leuco-Bars oil and Majoon Dabidul Ward in the Treatment of Vitiligo - A Case Study

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Abstract

A five-year old female child suffering from multiple sizes of vitiligo patches with intense itching and burning was registered. The size of the patches was measured about five cm long and three cm wide. The color of the patches was milky white at medial side of parietal region of the scalp. The patient was treated with Unani medicine. The Unani medicine was found effective in the treatment of Vitiligo, the study revealed. The multiple patches were almost subsided and other clinical features like itching and burning were also subsided at the end of the treatment.

Keywords: Burning, Itching, Leuco-bars oil, Vitiligo, White patches

Introduction

Vitiligo is known as a condition in which depigmentation of the part of skin occurs. Loss of the functionality of melanocytes is responsible for vitiligo but the real reason of vitiligo is unknown. However, some conditions including autoimmune, genetic, neural, viral infections and oxidative stress could have an important role in vitiligo (Halder, *et al.* 2009). The prevalence of vitiligo is less than 2% world-wide (Bolognia, et al; 2007). Vitiligo is divided into two types: Chemical and idiopathic. The majority of vitiligo belongs to the idiopathic type. In vitiligo the hair and oral mucosa may also be depigmented. Generalized vitiligo or non-segmental vitiligo (NSV) is characterized by white patches, often symmetrical, that usually increases in size with time corresponding to a substantial loss of functioning epidermal and in some cases hair follicle melanocytes. Segmental vitiligo is an acquired chronic pigmentation disorder, characterized by white patches with a unilateral distribution that may totally or partially match a dermatome (Taieb, *et al.* 2007).

Case Study

A five- year old female child suffering from multiple sizes of vitiligo patches with intense itching over the patches was registered for this study. The size of the patches was measured about five cm long and three cm wide. The color of the patches was milky white at medial side of parietal region of the scalp. The patient was taking allopathic medicine for a very long time but there was no relief and therefore she decided to switch over to Unani medicine.

Methodology

The laboratory investigations, urine routine and microscopic, complete haemogram and stool test for ova and cyst were done just after registering

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the patient. General and local examinations were also performed to evaluate any abnormal finding. Measurement of patches was also recorded before and after the treatment. The photographs of vitiligo patches were also taken before and after the treatment. The total duration of treatment was two months and follow-up was done at an interval of every 15 days.

Local Examinations

In local examination, two different sizes of milky white patch on the medial side of parietal region of the scalp were noted.

Clinical Features

The following clinical features were observed at the baseline:

Patches, Itching, Burning and The hair on affected part was gray.

Drug Dose and Mode of Administration

The Leuco-Bars oil was given for local application and advised for exposure of the affected skin to the sunlight for five minutes daily. Majoon Dabidul Ward was given three gm orally twice a day (Kabeeruddin, 2010).

Table 1: Ingredients of Leuco-Bars oil

S. No.	Unani Name	Scientific Name
1.	Babchi	*Psoralea corylifolia*
2.	Chaksu	*Cassia absus*
3.	Panwar	*Cassia tora*
4.	Amla	*Emblica officinalis*
5.	Sandal surkh	*Pterocarpus santalinus*
6.	Sarphoka	*Tephrosea purpurea*
7.	Sirka desi	*Saccharum officinarum*
8.	Kunjad oil	*Sesamum indicum*

Table 2: Ingredients of Majoon Dabidul Ward

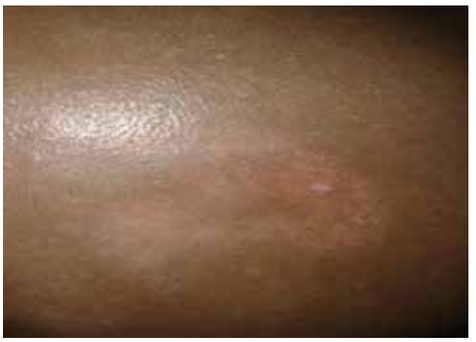
S. No.	Unani Name	Scientific Name
1.	Sumbuluttib	*Nordostachys jatamansi*
2.	Mastagi	*Pistacia lentiscus*
3.	Zafran	*Crocus sativus*
4.	Tabasheer	*Bambusa arundinacea*
5.	Darchini	*Cinnamomum zeylanicum*
6.	Izkhar	*Andropogon schoenanthus*
7.	Asarun	*Asarum europaeum*
8.	Qust Sheerin	*Saussurea lappa*

S. No.	Unani Name	Scientific Name
9.	Ghafis	*Agrimonia eupatorium*
10.	Tukhm Kasoos	*Cuscuta reflexa*
11.	Luk Maghsool	*Coocu lacca*
12.	Tukhm Kasni	*Cichorium intybus*
13.	Tukhm Karafs	*Trachyspermum roxburghianum*
14.	Zarawand Taweel	*Aristolochia longa*
15.	Habb-e-Balsan	*Commiphara opobalsamum*
16.	Ood Gharqi	*Aquittaria agobocha*
17.	Qaranfal	*Syzygium aromaticum*
18.	Dana Heel Khurd	*Elletaria cardamomum*
19.	Gul-e-Surkh	*Rosa damascena*

Observations

The photos taken before and after the treatment by Unani drugs Leuco-Bars oil and Majoon Dabidul ward clearly show a remarkable improvement in the vitiligo patches. The results suggest that the Unani drugs Leuco-Bars oil and Majoon Dabidul ward are effective in treating Vitiligo.

Before treatment



After treatment

It was observed in every follow-up visit that the colour of the patch was turning into normal skin and the size of patch was also getting reduced. At the end of the treatment, it was observed that the skin turned into almost normal in color. It may be due to the effect of many useful ingredients of Leuco-Bars oil like Psoralea corylifolia, Cassiatora, Pterocarpus santalinus and Tephrosa purpurea which are reported to be useful in leucoderma.

More precisely, it has been reported that (i) Cassiatora acts as blood purifier and detergent; (ii) Pterocarpus santalinus is useful in skin diseases and (iii) Tephrosa purpurea is also used as blood purifier (Kabeeruddin, 1937). The unani drug Majoon Dabidul ward was given orally and may have played an important role as its various ingredients have been reported as vital organ tonic, anti-inflammatory and tonic for liver and spleen. (Kabeeruddin, 2010)

Conclusion

Based on the observations, it can be concluded that the drugs Leuco-Bars oil and Majoon Dabidul ward are effective in the treatment of Vitiligo. However, the authors feel that a large scale study on these drugs involving more number of patients may be undertaken to substantiate the findings of this study.

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सारांश

विटिलिगो के उपचार में यूनानी औषधि ल्युको-बर्स और माजून दबीदुल वर्द का नैदानिक मूल्यांकन - एक केस अध्ययन

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तेज खुजली और जलन के साथ विटिलिगों दाग़ के कई आकारों से पीड़ित पांच वर्षीय बच्ची को पंजीकृत किया गया। दाग़ों के आकार लगभग पांच सेमी लम्बे और तीन सेमी चौड़े मापे गए। सिर की त्वचा के पार्श्विका भाग के मध्य की ओर दाग़ का रंग दूधिया था। रोगी का उपचार यूनानी चिकित्सा पद्धति से किया गया। इस अध्ययन में पता चलता है कि विटिलिगो के उपचार में यूनानी चिकित्सा प्रभावकारी है। उपचार के अंत में कई दाग़ कम हो गए और खुजली और जलन जैसे नैदानिक लक्षण भी कम हो गए।

शब्दकुंजी: जलन, खुजली, ल्युको–बर्स तेल, विटिलिगो, सफ़ेद दाग़

Concept of Blood in Unani Medicine

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Abstract

The basic physiology of Unani medicine revolves around seven fundamental factors viz. *arkān* (Elements), *mizāj* (Temperament), *akhlāt* (Humours), *a'da'* (Organs), *arwāh* (Vital force), *quwā* (Faculties) and *af'al* (Functions). The theory of four humours i.e. *dam* (blood), *balgham* (phlegm), *safrā'* (yellow bile) and *sawdā'* (black bile) are important in explaining health and disease in Unani medicine. Ancient physicians have described blood in details and conceptualized its attributes to the best of their knowledge and efforts. Since the normal quantity and quality of blood in human body ensures health, the blood in Unani medicine has been discussed in this paper. According to Avicenna, blood is derived from the metabolism of food and utilized as nutrient components for growth and repair of the organs and to yield energy for the work. According to Galen, attention should be focused on different kinds of foods suitable for the production of blood. This review aims to bring in an explicit account of the age-old Unani concept of blood. This would help the scholars, researchers and practitioners to have a proper understanding of blood.

Keywords: Blood, Humours, Food, Temperament, Viscosity

Introduction

Unani System of Medicine, a distinctive and complete medical system, has been prevailing in terms of theory and practice for two thousand years. Its theories and practices are somewhat different from Western medicine and may not be correlated with it altogether but are still relevant because of being very well thought of, comprehensive and pushing for the holistic approach of health management. The basic framework of this system is based on deep philosophical insights and scientific principles, including the Empedoclean theory of four Elements i.e. Air, Water, Fire and Earth; four proximate Qualities (*Kayfiyāt*) i.e. Hot, Cold, Wet and Dry as described by Pythagoras and the Hippocratic theory of four Humours (*Akhlāt*) i.e. Blood (*Dam*), Phlegm (*Balgham*), Yellow Bile (*Ṣafrā'*) and Black Bile (*Sawdā'*). The admixture of different elements and their qualities in a specific ratio in a particular entity, whether living or non-living, determines its temperament (*Mizāj*). Human temperament is commonly denoted by the dominant Humour i.e. Sanguine (*Damawī*), Phlegmatic (*Balghamī*), Choleric (*Ṣafrāwī*) and Melancholic (*Sawdāwī*). Also Unani Medicine believes that *Medicatrix Naturae* (*Ṭabī'at Mudabbira'-i-Badan*) is the supreme power which controls all the

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physiological functions of the body, provides resistance against the diseases and helps in healing naturally (Kabeeruddin 1930).

The definition of health has been stated as a state of well being. Keeping the criterion of inclusion of all the body functions in mind, Avicenna and Galen have stated health as a state of body in which all functions of body are normal. However, for Avicenna there are two states of human body i.e. health or disease, while Galen has also described a third state viz. *halite salesa* (third state) representing convalescent stage in which individual is afflicted with certain anomalies but the body appears to function normally (Kabeeruddin 1930).

Humoral theory is considered as the backbone of Unani System of Medicine. It explains various functions of the body, ranging from providing nutrition to the beautification of the body. According to Hippocrates, when the four *akhlāt* (Humours) viz. *dam* (sanguine), *balgham* (phlegm), *safrā'* (yellow bile) and *sawdā'* (black bile) are mixed in right proportion, the body is in a state of health but when there is a state of dyscrasia, disequilibrium or irregular distribution then diseases arise (Israili 1981, Lone 2012).

The blood is a mixture of all four humours. Since one of its important components i.e. *dam* accounts for a significant quantity of the mixture, therefore, its red colour dominates and the whole mixture is broadly called as *dam* (Blood) (Nafis 1954, Masihi 2008). Blood provides nutrition to the body and acts as *badl ma yatahallal* (replacement for wear and tear). This replacement is often equal to the sum of wear and tear in adults while the replacement is more in childhood and less in old age (Nafis 1954). Abu Sahal Masihi (960-1000 AD) has defined that *tabi'i khūn* (normal blood) is one in which all humours are distributed in normal proportion, both in terms of *kayfiyat* (quality) and *kammiyat* (quantity) (Kabiruddin 2009, Kabiruddin 2010). This ancient perception of blood has still not been inquired into minutely therefore its explicit description is not available. This review aims to put forth the concept of blood as stated in Unani medicine and to correlate it with modern concept of blood to the possible extent.

Methodology

An extensive review was carried out to record all the available information in Unani literature on concept of blood including relevant books available in different languages (Persian, Arabic, English and Urdu), periodicals and indexed journals.

Production of Blood

According to Avicenna, all the four humours are primarily derived from the metabolism of food and utilized as nutrient components for growth, maintenance and repair of the organs and to yield energy for the work. Blood is distributed to all the organs through the vessels to fulfill their different requirements (Razi 1991). As soon as food enters the mouth, teeth start crushing it and tongue helps in mixing the food items with saliva. Parts of food get digested in mouth before reaching the stomach where remaining process of digestion takes place. Simultaneously *qalb* (heart) also plays an important role though indirectly in digestion through its *harārat gharīziyya* (innate heat/natural heat). It helps not only in distribution of food particles to the body parts but also helps in their assimilation (*tagairaah*). After gastric and intestinal digestion, food turns into chyme and chyle. *Ma'sareqa* (mesenteric vessels) and the branches of the portal vein (*warid al-bab*) absorb the food from gut and carry it to the liver where hepatic digestion takes place; chyle is converted into four humours in varying quantities, blood being the largest (WHO 2010). Unani physicians hold the opinion that most of the metabolic functions take place in liver whereas the modern medicine argues that various useful substances are formed in liver which directly or indirectly controls the heamatopoeisis (Sembulingam 2013,). According to the Northern blot analysis, the liver and kidneys appear to be the major sites of thrombopoietin mRNA expression (de Sauvage 1994). The findings of a study demonstrate that liver is the major site of thrombopoietin (Tpo) production and altered hepatic Tpo production will lead to a significant reduction in platelet levels (Qian 1998). Further, biological assay of the human liver in various types of anaemia also showed conspicuous differences in the concentration of haemoglobin producing factors (Whipple 1993).

The sinuses of liver can release several hundred milliliters of blood into circulation. Now it is clear that most part of the blood and its components like black bile, yellow bile and phlegm are produced in liver that is why Nafis (15th cent AD) stated that, "Normal blood is one which is formed and processed to purity in the liver". However, presently it may explain the haemopoiesis during mid trimester of gestation. Guyton describes hepatic macrophage system as the blood-cleansing system which is also carried at hepatic level. Blood flowing in intestinal capillaries picks up many bacteria from the intestines. A sample of blood taken from the portal veins, before it enters the liver, almost always grows colon bacilli when cultured, Kupffer cells, the large phagocytic macrophages cleanse blood in less than 0.01 second; the bacterium passes

inward through the wall of the Kupffer cell to become permanently lodged inside until it is digested (Hall 2011). Blood is mostly produced with hot and moist food such as *lahm* (meat) (Nafis 1954). This has been accepted by the contemporary physiology, that meat contains first class proteins i.e. essential amino acids which are essential for formation of haemoglobin and help in the production of plasma protein (Whipple 1940). The stomach protein and nucleoprotein of the blood corpuscles are also formed with these first class proteins (Khurana 2009).

Characteristics of Blood

Blood is considered a heterogeneous fluid because almost all humours participate in its composition. However, the broad division of composition includes *akhlāt latifah* (fine parts of humours) and *akhlāt kathifa* (coarse parts of humours) and may be taken as correlates of liquid part and cellular elements respectively as described by modern physiology. *Akhlāt kathifa* have barid kaifiyat predominant and take part in assimilation by the organ while *akhlāt latifah* have *har kaifiyat* predominant and carry out vital function and are dynamic. Here an analogy to the heavier part of blood is referred to *Kaseef akhlat* like RBC, WBC etc. and lighter part to *lateef akhlat* like plasma. The best parts of all humours are supposed to be intermingled in blood. Yellow bile maintains the viscosity of blood and makes it *latif* (diffusible), the black bile provides mass and thickness to the blood due to which the blood is retained in its place and the phlegm makes the blood sticky. All these humours are attributable to the primordial importance of blood as these components are intermingled with it and the body organs take their required nutrition from the blood (Ahmed 1980).

The desired *qiwam* (viscosity) of blood considered as one of its important properties is *mu'tadil* (normal) indicating that it is equiponderantin thinness and thickness (Nafis 1954). The viscosity of blood depends on the quantity of humours and tension of *al bukharate dukhaniya* (carbon dioxide) (Burch 1965) in the blood. That is why Al Abbas (994 AD) claimed that the *qiwam* (viscosity) of arterial blood is lower than the venous blood (Majoosi 1294). The ancient physicians had explained the coexistence of four humours in the body with the help of its physical property of sedimentation. They reported that when the *fasd* (venesection) was performed and blood was taken in a bowl, its heavier part settled down soon. Due to this sedimentation, four layers of blood were seen. The uppermost layer which was the thinnest of all, devoid of any corpuscle and bore yellow colour was called yellow bile. Below the layer of yellow bile was a denser and white layer lacking any

corpuscles was called as phlegm; below this layer was a relatively heavier layer of red colour consisting of corpuscles was called as *dam*. The lowermost layer was heaviest of all and contained all heavier compounds and packed deoxygenated red blood corpuscles exhibiting dark blackish colour. Due to its dark or blackish colour it was called black bile (Ahmed 1980).

When blood is shed, it quickly loses its fluidity and sets into semisolid jelly. This phenomenon is called as coagulation. The coagulated blood if kept further for sometime retracts to a smaller volume and passes out a straw coloured fluid called as *masal-al-dam* (serum). The phenomenon of *injimād-al-dam* (coagulation of blood) was well known to the ancient physicians. Abu Sahal Masihi (960-1000 AD) called the threads of fibrin of clot as *"khoyoot"* and suggested *hābis-i-dam* (coagulants and styptics) agents to arrest bleeding (Kabiruddin 2009). It has been mentioned that intravascular clotting is prevented by the role of *tabiat* (physics) or the structure of vessels (Razi 1991). This has also been accepted by modern scientists who suggested that in vessels, there are some protective substances which protect blood from clotting. A healthy vessel produces vasoactive hormones known as nitric oxide and prostacyclin. Both nitric oxide and prostacyclin relax blood vessels and inhibit platelet activation thus prevent intravascular coagulation (Mitchell 2007). Coagulation depends on various factors (chemical compounds) present in the blood. Deficiency in any of these factors causes *su'almizāj* (dyscrasia) in the blood leading to haemorrhage or delay in coagulation which may derange the haemostatic mechanism of the body.

Ancient physicians have tried to describe the quantity of *dam* in the body and its actual share in total humoural fluid. A group of Unani scholars is of the view that *dam* is half of total humoural quantity followed by black bile, phlegm and yellow bile. According to Nafis (15th cent. AD) the authentic statement in this regard is that of Abu Sahal Masihi (960-1000 AD), who said that black bile is found minimally in the composition. Hence most of the physicians reckoned that the quantity of *dam* is high followed by phlegm, yellow bile and black bile (Kabeeruddin 1930). *Mizaj* (temperament) is a unique concept of Unani medicine as the functions of organs/tissues depend on or mediated through it. The temperament of blood has been described to be *hār ratab* (hot and moist) which assumes significance because of its widespread occupancy in the body (Nafis 1954, Kabiruddin 2010, Masihi 1986, Baghdadi 2005, Jurjani 2010). *Harārat* (heat) of blood indicates that some of its constituents participate in the production of heat (Kabiruddin 2010) which in turn helps in maintaining the body temperature and keeps certain variables of the body

in equilibrium. This is mainly achieved through blood plasma which absorbs or give off heat and through the speed at which the blood flows. When the blood vessels expand, the blood flows slowly which causes heat to be lost and vice versa (www.ncbi.nlm.nih.gov/pubmedhealth).

Unani scholars have given reasons for the verification of the temperament of blood for example, if it is formed by the foods of hot and moist temperament like meat, alcohol and dates etc.; then the blood causes hot wet diseases like *humma mutbiqa* (continuous fever) which is cured by drugs of opposite temperament i.e. *bārid yābis* (cold and dry) medicine (Nafis 1954). The hot temperament of blood reflects on the realization that the organs which are highly supplied by blood are hot while those having poor blood supply are either less hot or cold. Further, if the supply of blood of an organ is seized the organ becomes extremely cold and even death of the part occurs soon. Another reason of its hotness is that it maintains the body at a uniform temperature (Ahmed 1980) and keeps the viscera warm to perform their normal function. Blood contains many constituents which are potentially hot e.g. when they reach the organs; they are oxidized to produce heat and energy (Nafis 1954). It is *ratab* (wet) because of the presence of moist substances in it which accounts for 91-92% of the total blood, that is why it produces such signs and symptoms in the body which are attributed to *rutūbat* (wet/moist substances).

Table 1: Characteristics of Blood in Unani and Conventional Medicine (Nafis 1954, Kabiruddin 2010, Masihi 1986, Tabari 2010, Tortora 2009, Marieb 2009)

Characteristics	Unani medicine	Conventional medicine
Colour	scarlet red (arterial)	bright red (arterial)
	dark red (venous)	dark red/purplish (venous)
Odour	Odourless/devoid of bad odour	characteristic/devoid of bad odour
Temperament	Hot	slightly warmer than body temperature
Viscosity	Moderately viscous	much more dense than pure water
Taste	Sweet	Metallic
Reaction	Alkaline	pH range from 7.35 to 7.45 (slightly alkaline)

Functions of Blood

The functions of blood explained by ancient physicians are more or less same as described in modern physiology. According to various eminent Unani scholars, blood gives nutrition and helps in growth of organs and body (Nafis 1954, Masihi 2008, Kabiruddin 2010, Baghdadi 2005, Rushd 1987). Almost similar description has been given by Western medicine where it has been mentioned that nutrients derived from the digested food materials i.e. glucose, amino acids, lipids, etc. are absorbed from the alimentary canal and carried by blood to tissues for their growth (Tortora 2009). It provides *harārat gharīzi* (innate heat) to various organs through the arteries arising from the heart (Nafis 1954, Kabiruddin 2009, Kabiruddin 2010). It also provides energy and helps in replacement of wear and tear (Nafis 1954). According to conventional medicine, blood flow is required for healing and maintenance and growth of body cells. Further, it has been elucidated that changes in blood flow rate affect growth of cell population and if blood supply further decreases, cells may die. One of the life saving functions of blood described in Unani text is that it keeps the body warm (Nafis 1954). This is also similar to functions stated in modern physiology indicating that blood regulates body temperature through high specific heat, high thermal conductivity, high latent heat of vaporization and quick flow. According to Unani physician, blood makes the skin lustrous, red, attractive and beautiful (Nafis 1954, Kabiruddin 2009, Kabiruddin 2010, Baghdadi 2005). Blood flow nourishes the skin cells and keeps them lively. Blood flow also carries away waste products and toxic substances including free radicals from working cells thus keeps skin healthy and lovely. Blood provides *madda* (material) for the genesis of *a'da' mutashabiha* (homogeneous organs) and acts as *hamile ruh* (carrier of oxygen). It serves as a link between individual cells of distant organs and tissues (Ibn Sina 2014).

Types of Blood

Ismail Jurjani (1041-1136 AD) has classified blood into two categories. First one is red and somewhat viscous, found in liver and vessels arising from it. Other is bright red present in heart and in the vessels arising from the heart (Jurjani 2010). Other physicians have divided blood into two different types i.e. normal and abnormal (Kabeeruddin 1930, Nafis 1954, Mitchell 2007). Unani scholars have mentioned a few physical qualities of normal blood in respect of its colour, taste, smell, viscosity etc. Colour of blood is red though the shades of arterial and venous blood vary a little (Kabeeruddin 1930, Mitchell 2007, Masihi 1986, Baghdadi 2005). Ali Ibn Abbas Majoosi (died 982–994

AD) stated that the colour of arterial blood is scarlet red and vein is dark red. Blood is sweet in taste (Nafis 1954, Kabiruddin 2009, Masihi 1986) as sweet substances similar to grape juice are found in the composition of blood in large quantity. But when changes occur in its quality it becomes sweet as alcohol (Kabiruddin 2010). Because of its sweetness, organs absorb blood easily in required quantity (Nafis 1954). Some of the salty substances have also been described to be present in the blood which are considered beneficial for the body. It dissolves excessive phlegm and prevents blood from *ufūnat* (sepsis). Normal blood is odourless (Nafis 1954, Masihi 1986, Rushd 1987) but some of the scholars have mentioned about the presence of odour in the blood (Masihi 2008, Masihi 1986, Baghdadi 2005). However, it has been stated that blood should be free from bad odour because it is a clear sign of sepsis. Bad smell of blood is associated with *humudat* (acidity) which is mainly caused due to fermentation (Nafis 1954), a correlate of sepsis. Blood should be normal in viscosity (Nafis 1954, Baghdadi 2005, www.ncbi.nlm.nih.gov/pubmedhealth). Blood with normal viscosity provides nutrition to both hollow and dense organs and the *ruh* (pneuma) can be formed from it (Nafis 1954). If a person's blood is normal in quantity and quality, then he looks happy and all his activities are in order (www.ncbi.nlm.nih.gov/pubmedhealth). But when it is altered somehow the alteration in temperament of blood takes place leading to a reduction in the oxygen carrying capacity of the blood. As a result, organs are affected badly which further disturb the temperament of blood. This causes deranged body functions i.e. diseases.

Conclusion

On the basis of the above review, it is concluded that blood is a mixture of all the four humours in which *dam* is a major component. Unani physicians have given a comprehensive account of qualitative and quantitative features of blood which correlate considerably with what has been described in conventional physiology. It is also evident that whatever conventional medicine has described about blood with the help of analytical instruments, much of them has been mentioned by ancient physicians merely on the basis of observation. A correlation between the two may help in understanding the physiopathology of many diseases and their successful management.

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सारांश

यूनानी चिकित्सा में रक्त की अवधारणा

[1]अंसारी मुशीर, [2]नसरीन जहां, [3]गुफ़रान अहमद, [2]जी. सोफ़ी, [2]अब्दुल वदूद और [4]आबिद अली अंसारी

यूनानी चिकित्सा का मूल शरीरक्रिया विज्ञान सात मूलभूत कारकों अर्थात् अर्कान (तत्व), मिज़ाज (स्वभाव), अख़लात (मनोवृत्ति), अजा (अंग), अर्वाह (प्राणशक्ति), कूवा (आंतरिक शक्ति) और अफ़ाल (कार्य) के चारों तरफ घुमता है। यूनानी चिकित्सा में स्वास्थ्य और रोगों के बारे में समझाने के लिए चार ह्यूमर्स अर्थात् दम (रक्त), बलग़म (फिलग्म), सफ़रा (पीली पित्त), और सौदा (काला पित्त) का सिद्धांत महत्वपूर्ण है। प्राचीन चिकित्सकों ने रक्त का विस्तृत रूप से वर्णन किया है और अपने अथक ज्ञान और प्रयासों से इसकी विशेषताओं के बारे में बताया है। चुंकि मानव शरीर में रक्त की सामान्य मात्रा और गुणवत्ता स्वास्थ्य को सुनिश्चित करती है इसलिए इस पत्र में यूनानी चिकित्सा में रक्त के बारे में चर्चा की गई है। इब्ने सीना के अनुसार रक्त भोजन के चयापचय से मिलता है और अंगों के विकास तथा उनकों ठीक करने और कार्य करने के लिए ऊर्जा हेतु पोषक तत्वों के रूप में उपयोग किया जाता है। गैलेन के अनुसार, रक्त को बनाने के लिए विभिन्न प्रकार के उचित खाद्य पदार्थों पर ध्यान केंद्रित किया जाना चाहिए। इस समीक्षा का उद्देश्य रक्त की सदियों पुरानी यूनानी अवधारणा को स्पष्ट रूप से सामने लाना है। यह विद्वानों, शोधकर्त्ताओं और चिकित्सकों को रक्त के बारे में उचित समझ रखने के लिए मदद कर सकेगी।

शब्दकुंजीः रक्त, ह्यूमर्स, भोजन, स्वभाव

Establishment of a Format to Assess *Su-i-Mizaj* (Deranged Temperament) in *Auja-i-Mafasil* (Arthritis)

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Abstract

Unani system of medicine describes the abnormal state of the body as *Su-i-Mizaj*. Assessment of the *Su-i-Mizaj* depends upon the diagnostic criteria that are called as *Usool-i-Tashkhish* which are established by *Tashkhisi dalâ-il*. Accordingly, Unani system of medicine presents a typical *Tashkhisi dalâ-il* for the diagnosis of joint diseases. It is based on the involvement of humour which is important in the diagnosis of joint disease. Also, examination of the Bawl-o-Baraz plays an essential role in the assessment of *Su-i-Mizaj*. History of the patient, examination, lifestyle, habitat, inheritance and other predisposing factors are considered for the diagnosis of arthritis.

In this format, the humour is symbolized by four colours (Red for *Dam*, yellow for *Safra*, Sandal for *Balgham* and grey for *Sawda*). Indeed, it is a form of questionnaire in which each question is followed by an answer to be replied by the patient. The larger number of similar answers given by a patient is suggestive of the *Su-i-Mizaj* of the respective humour. Furthermore, the severity of features is presented in bar graphs in this paper to evaluate the qualitative and quantitative effect of humour and predisposition is also mentioned separately in figures to ascertain the other factors of joint disease.

Keywords: Arthritis, Diagnosis, Disease, Format, Humours

Introduction

The diagnostic method is the main part of the Unani system of medicine since ancient times and it is based on clinical features of the patient. The clinical features in the Unani system of medicine presented under the pathological condition of the body are known as *Su-i-Mizaj*. Indeed *Su-i-Mizaj* is derangement in temperament that maybe developed in the whole of the body or only in one or more organs. In the assessment of *Su-i-Mizaj,* a lot of scientific descriptions (*Tibbi Dală il*) are presented in the Unani text that is called *Tashkhisi Dală il*. It plays an important role in the correct diagnosis of the derangement of the body. In the context of arthritis (*Auja-i-Mafasil*), descriptions about *Su-i-Mizaj* are presented in accordance with humours that help in the determination of *Auja-i-Mafasil Damwi/Balghami/Safrawi* and *Sawdawi*. Furthermore, it is also mentioned that many other factors either from external or internal origin predisposing the types of Arthritis (*Auja-i-Mafasil*)

Assessment of *Su-i-Mizaj* is completed by evaluation of vital and diseased organ as mentioned in *Usool-i-Tashkhis*. Clinical examinations (*Muayana marid*) systemic and local and palpation of pulse (*Nabd*) investigation of urine (*Bawl*) and

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stool (*Baraz*) are important criteria in assessing the *Su-i-Mizaj* of the patients. (Ibn sina,1899; Hamdani,1998)

Literature

1. "Niqris,Irqun-nisa and *Waja-al-mafasil* are the same disease. Pain and swelling in joint are called *waja-al-mafsil* (Razi, 2004)
2. According to Galenon "*waja'al-Mafasil* or joint pain generally affects those people who live with inadequate exercise, digestive problems, alcoholism, fond of sugar and frequent coitus (Razi, 2004).
3. *Auja-i-Mafasil* is a painful inflammatory condition of joint of the body (Majoosi,1887).
4. Joint pain of the body including *Niqris, Irqun-nisa* is called *waja'al-Mafasil*. Most conditions of the joint diseases are considered as lineal transmission in the patients (Ibn sina, 1899).
5. Joint disease is commonly developed in the people whose body remains full of humours for a longer period (Ibn Hubal, 2007).
6. *Waja'al-Mafasil* is a type of pain and swelling in the joint, often it develops in the surrounding structure as in the tendon, ligament and other composition of the joint (Samarqandi, YNM)
7. *Waja'al-mafasil* is a disease of peripheral joints of the body (khan, 2011)

Assessment of *Su-i-Mizaj* (Deranged temperament)

It is assessed by two components as given below:

1. *Tashkhisi Dală il* from internal organs: Shape of organs and simulant, Place and position of the Organ, Connective Organ, *Anasir-i-Uzw* (Essence of Organ) and Vessels, Nerve and passages of organ (Hamdani,1998)

2. *Tashkhisi Dalâ il* from *Auja-i-Mafasil* (Arthritis): It can be highlighted by the following:

1. **Diagnosis of Simple Derangement:** It occurs rarely, onset is slow/gradual, without solidity of joint, without discoloration and feature of Hot/Cold/Wet/Dry might be the proven signs (Ibn-Sina,1899; Arzani,1903)
2. **Diagnosis of Humoural Derangement:** Comprises four divisions as described below:
    1. *Damwi* (Sanguine) Derangement
        - Affected part red
        - Distinct swelling (Ibn-hubal, 2007; Arzani,1903)
        - Throbbing pain

- *Tamaddud* (Tension) Moderate
- Severely tender (Samarqandi., ynm)
- Warmth and tender more than *safra*
- Seasonal flicker (Specially in autumn and spring season)
- History of blood (plethora) enhancing foods/medicine
- Bodily temperament-hot and wet
- Muscular physique (Arzani,1903)
- Adulthood
- Relief by taking cold foods/medicines/practices (Ibn Sina,1899, Ibn-Hubal, 2007, Samarqandi, YNM)

2. *Safrăwi* (Bilious) Derangement
   - Affected part yellow
   - Severe pain (Samarqandi., YNM)
   - Tenderness
   - Severe burning and warmth
   - pulse rapid
   - Urine *nari* (blazing) colour
   - Most likely superficial pain in comparison to *Damwi*
   - Very mild *Tamaddud* (Tension) and *siql* (solidity) (Arzani, 1903)
   - Swelling is not distinct/Severe inflammatory conditions (Ibn Hubal, 2007)
   - History of bile producing diets/ practices positive.
   - Susceptibility of Age/habitat/addiction / bodily temperament might be proven sign of *Safrăwi* derangement.
   - Relief by cold foods/medicines/practices (Ibn-Sina, 1899. Samarqandi, YNM, Arzani,1903)
3. *Balghami* (Phlegmatic) Derangement
   - Normal colour over the joint
   - *Siql* (solidity) severely present
   - No burning and heat
   - Moderate and continuous pain in *Amiqu-o-arid* (Depth and width)
   - Swelling soft and desecrated
   - Other features of *Balghami* temperament may be present
   - Age/climate, history of cold practice and other susceptible factors may be present
   - Temperature may not be raised

- Relief by hot foods/medicines/practices (Ibn-Sina1899, Ibn-Hubal 2007, Samarqandi YNM, Arzani1903)

4. Features of *Sawdawi* (melancholic) Derangement
   - Mild pain
   - Mild *Tamaddud* (tension)
   - Hard swelling
   - Bluish discoloration of joint
   - Appetite increased
   - Other features of melancholic will be verified.
   - Hardly treatable.
   - Relief by hot and wet practices/foods/medicines. (Ibn-Sina1899, Majoosi 1887, Samarqandi YNM, Arzani 1903, Tabri 2010).

Examinations

1. Assessment of *Alamat* complaining by patients (presenting complaints)
2. *Muayana-i-Mareed* Examination of the patients to rule out the sign
3. *Rudad-i-Mareed* History of the patients: present, past, personal, socio-economic, treatment, environment, family history etc.
4. *Muayana-i-Nabd:* palpation of pulse
5. *Muayana-i Bawl-o-Baraz :* as well as *Muayana-i-Bawl-o-Baraz* (investigation of Urine and stool).

Localization of Symptoms

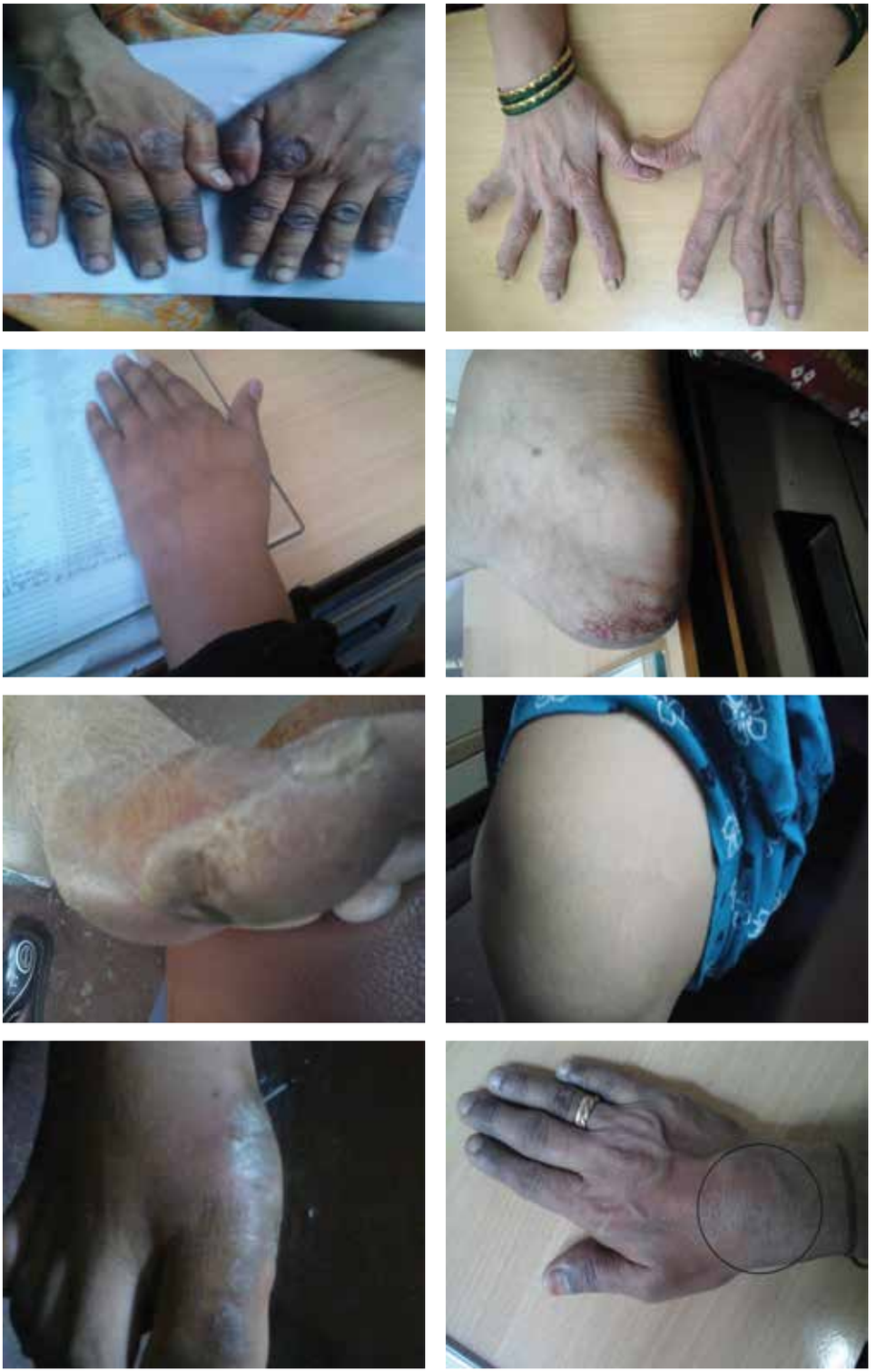
1. Whether the colour of the skin over joint is changed or not, if yes, then what is the prominent colour
2. Either swelling is present or not, if yes, then what type.
3. Pain either associated with joint or other surrounding structures, (Majoosi 1887, Samarqandi YNM, Razi 2004)
4. Either Joint pain is deep-seated or superficial. Either associated with burning/ cooling or intense of feeling.
5. Either pain associated with *Siql* (solidity), *Tamaddud* (tension), *khushunat* (Coarseness) or crackle etc.
6. Either the pain from surrounding structures is bearable or not. (Ibn-Sina 1899, Jurjani 1887, Samarqandi YNM)

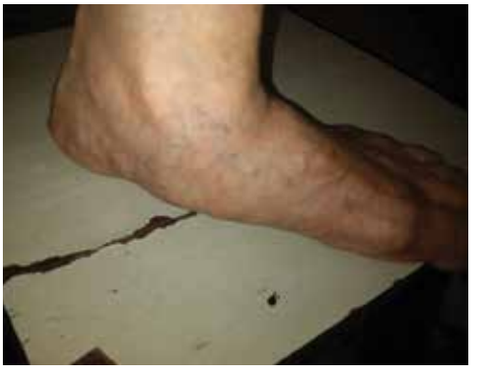
Additional information of *Asbāb Muiddah* (predisposing factors)

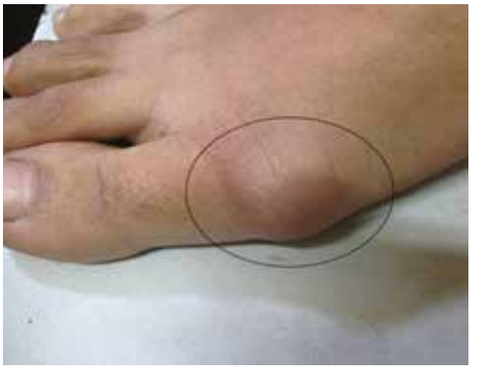
Evaluation of predisposing factors must be ruled out e.g. Diabetes, Syphilis, gonorrhoea, nutritional deficiency, Injury, Heavy physical work, dietary habit,

environment, menopausal age of women, indolent life, lack of exercises, habitualness of Hammam, frequent meal etc. are said to be the predisposing for Arthritis. (Razi 2004, Ibn Sina1899, Samarqandi YNM, ; khan 2011, Kabeeruddin 1980, Ibn-Hubal 2007).

Figures Presenting Different Types of Arthritis







Assessment

All the information collected is presented in the following format:

Format for Assessment:

S. No.	Clinical features	Presentation by colours according to Humours			
1	***Discolorations of the skin over joint***	(A) Red		(C) Wheat colour/ Normal colour	
		(B) Reddish/yellow		(D) Earthy/bluish	
2	***Pain***	(A) Very severe		(C) Moderate to mild	
		(B) Severe		(D) Mild	
3	***Swelling/ Inflammation***	(A) Massive		(C) Soft desecrated	
		(B) Ill distinct		(D) Hard	
4	***Tenderness***	(A) Tender		(C) Moderate to mild	
		(B) Very Tender		(D) Mild	
5.	***Local temperature***	(A) Raised		(C) Not raised	
		(B) Raised		(D) Not raised	
6.	***Siql (solidity)***	(A) More heaviness		(C) No heaviness	
		(B) Heaviness		(D) No heaviness	
7.	***Tamaddud (Tension)***	(A) Moderate		(C) No/very mild	
		(B) Mild		(D) No	
8.	***Burning (Jalan)***	(A) Severe		(C) No	
		(B) Moderate		(D) No	
9.	***Character of pain***	(A) Hitting/coarse		(C) Dull	
		(B) Burning		(D) Shooting	
10.	***Body temperament***	(A) Damwi		(C) Balghami	
		(B) Safrawi		(D) Sawdawi	

S. No.	Clinical features	Presentation by colours according to Humours	
11.	***Age and physic***	(A) Matured & muscular (B) lean and thin	(C) Obese & aged (D) Old & lean
12.	***Season***	(A) Winter (C) Summer	(B) Spring (D) Autumn
13.	***previous practices***	A) H/o Hot practice/ Foods/Medicine/ blood enhancing previously B) H/o Hot practice/ Foods/Medicine previously/ safara producing practice	(C) H/o cold practice /phlegm producing foods previously (D) H/o Dry practice/ Dry Foods/ Medicine
14	***Aggravating and relieving factors***	(A) Relieving by Cold practice/foods	(B) Relieving by Hot practice/Food
15	***Time course(onset)***	(A) Suddenly	(B) Gradually/Slowly
16	***Family history***	(A) Positive	(B) Negative
17	***Susceptibility of physical movement***	(A) Heavy physical work/Vigorous exercise	(B) Less physical work/No or least exercise
18	***Pulse***	(A) Azeem-o-Qawi (B) Saree-o-Mutwatir	(C) Sulb mutashannuj (D) Layyin o Bati
19	***Addictions Alcohol/ Tobacco/ Others***	Positive	Negative
20	***Other predispositions***		
	1. Maleness	Positive	Negative
	2. Menopausal age of women	Positive	Negative
	3. Injury	Positive	Negative
	4. General weakness	Positive	Negative
	5. Long standing illness	Positive	Negative
	6. Weakness of any vital organ	Positive	Negative

(Note: Symbols: Red colour for Damwi, Yellow Colour for Safrawi, Sandal colour for Balghami and grey colour for Sawdawi,)

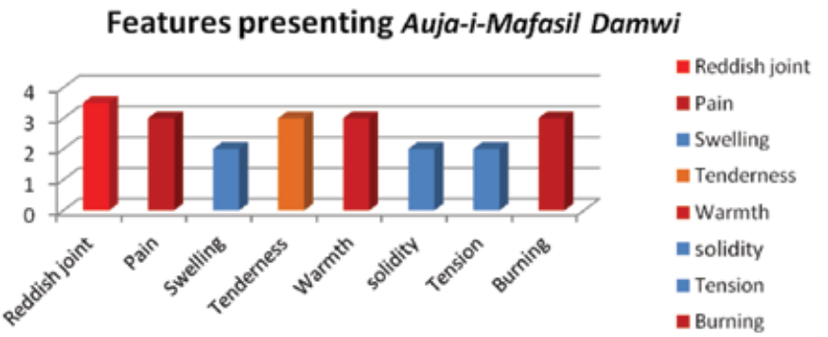
(B) Investigation of Urine and Stool : (Visual analysis)

Urine: Blazing colour = For *Damavi*, Yellow colour = For *Safaravi*, colourless/ white = For *Balghami*, Turbid smoky = For *Saudavi*

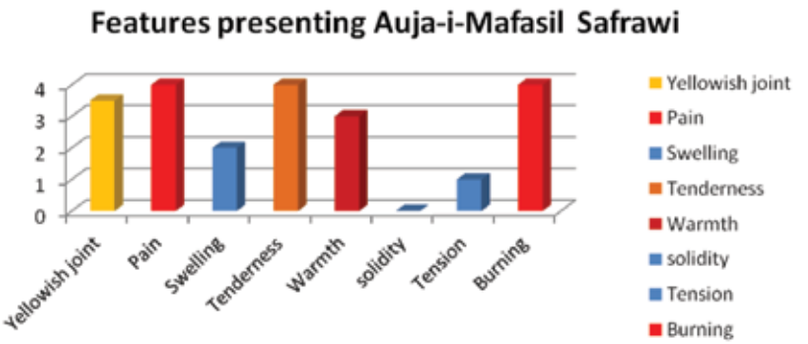
Stool: Reddish colour = For *Damavi*, Yellow colour = For *safravi*, white/earthy colour = For *Balghami*, Dark brown/black colour = For *Saudavi*

Observations

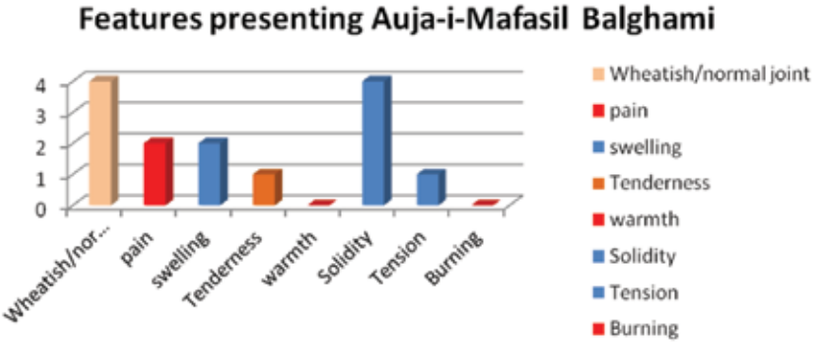
(A) Characteristic Features



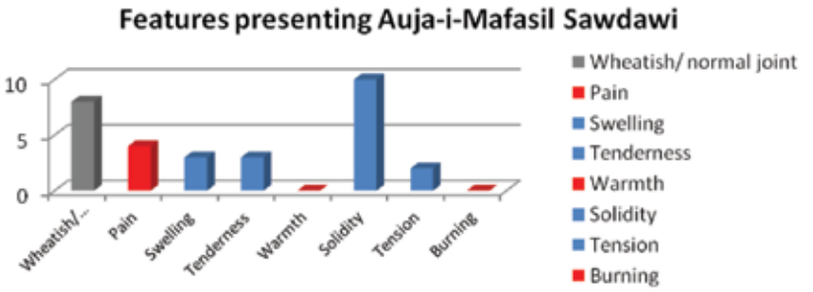
Graph 1:Features of *Auja-i-Mafasil Damwi*



Graph.2: Features of *Auja-i-Mafasil Safrawi*



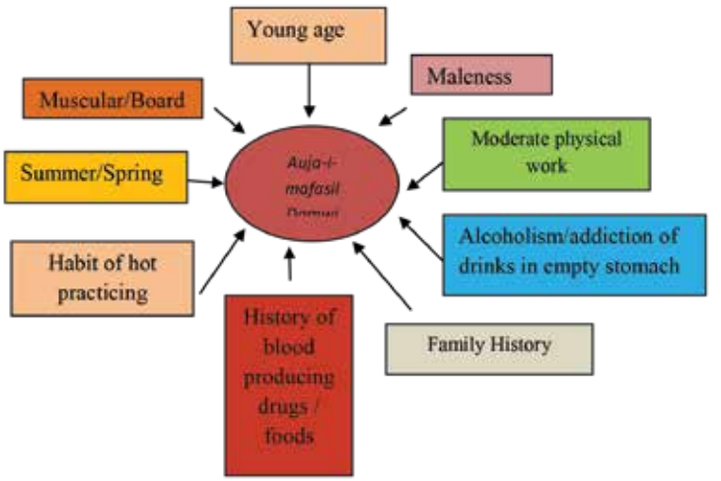
Graph 3: Features of *Auja-i-Mafasil Balghami*



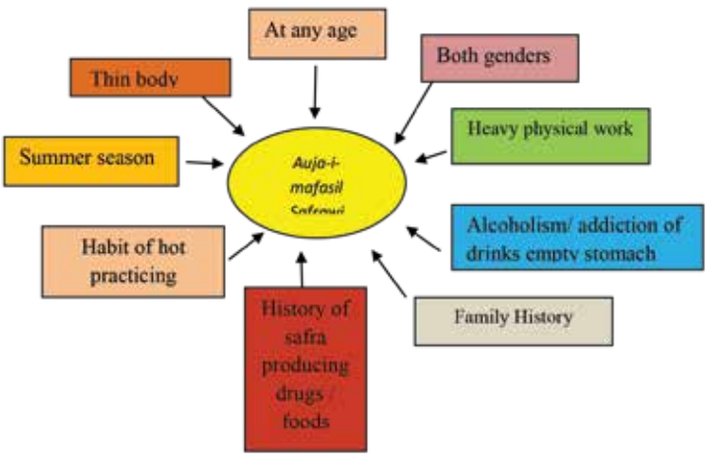
Graph 4: Features of *Auja-i-Mafasil Sawdawi*

(B) Susceptible/Predisposing Factor

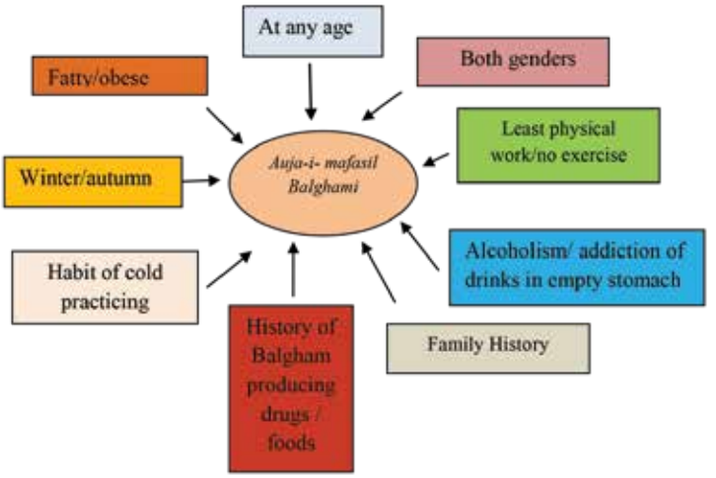
(A)



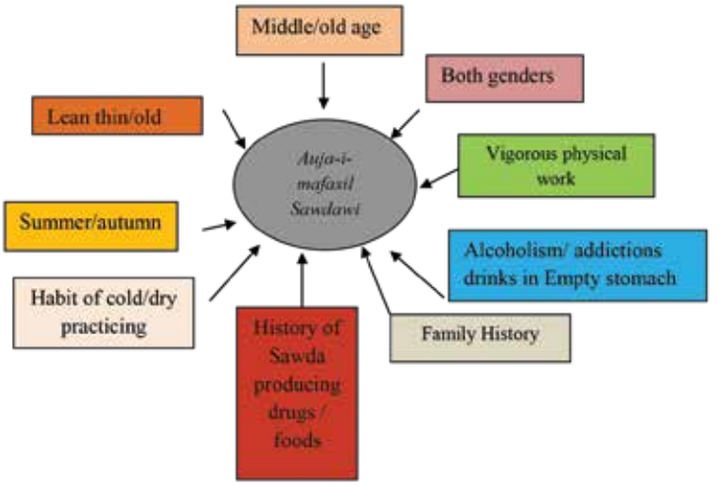
(B)



(C)



(D)



Discussion

A patient of arthritis who had the most red answers in the questionnaire is suggestive of *Waja'al Mafasil Damwi*, yellow for *Waja'al Mafasil Safrawi*, Sandal for *Waja'al Mafasil Balghmi* and grey for *Waja'al Mafasil Sawdawi* (Ibn-sina 1899, Arzani 1903,Samarqandi YNM, Azam khan 2011.

Graphs (A) showed the severity of typical features of quantitative and qualitative involvement of Humour in *Auja-i- Mafasil*. It showed that red discoloration suggestive of infiltration of *Dam*, yellow for *Safra*, normal for *Balgam* and Grey/brown for *sawda* over the joint, same description has been presented by Samarqandi YNM, Arzani 1903 and Azam khan 2011.

The severity of pain was higher in *Waja'al Mafasil Safrawi*, lesser in *Damwi* and minimum in *Balghami* and *Sawdawi*. Swelling was prominent and discrete in *Damwi*, inflammatory in *Safrawi* (Majoosi 1887) while soft discrete, may or may

not be graspable, was found in *Balghami* and hard in *Sawdawi*. Tenderness is more in *Safrawi* than *Damwi* and in Balghami tenderness may or may not be present. Warmth is peaked in *Damwi* than *Safrawi* while Balghami and *Sawdawi* are not warmth. Solidity was found most in *Balghmi*, least in *Damwi* and tension is more in *Damwi* than others. Burning is severe in *Safrawi*, moderately in Damwi and may be in *Sawdawi* but not present in *Balghami* (Ibn sina 1899, Arzani 1935, khan 2011).

Graphs (B) Showed that the patient having different predispositions according to age, physic, gender, family history, climate, addiction, works nature and special practices. It is cleared that different predisposition is prone to different type of Arthritis, e.g. a muscular and young man with moderate activities is susceptible to *Waja'al Mafasil Damwi,* while thin, old man, hard working and hot weathering is susceptible to *Waja'alMafasil Safrawi* and dry climatic habitat is prone to *Waja'al Mafasil Sawdawi*, on other hand, obese, middle-aged with low physical work, cold habitat or cold practicing is susceptible to *Waja'al Mafasil Balghmi*. (Ibn sina1899, Arzani1935, khan 2011).

Conclusion

It is concluded that the description available in Unani literature about the *Su-i-Mizaj* is valid for correct diagnosis of *Auja-i-Mafasil*. It is also concluded that all *Tashkhisi dalâ-il* about *Su-i-Mizaj* that is generated in a format is equivalent to the texts described in the classical Unani books. It can be said that this format might be useful in the assessment of diagnosis of Arthritis.

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सारांश

ओजा-ए-मफ़ासिल (गठिया) में *सु-ए-मिज़ाज* (विक्षिप्त स्वभाव) का आकलन करने के लिए एक प्रारूप की स्थापना

*हुमैरा बानो

यूनानी चिकित्सा पद्धति में असामान्य शारीरिक अवस्था को सु–ए–मिज़ाज के रूप में बताया जाता है। सु–ए–मिज़ाज का आकलन नैदानिक मानदंडों पर निर्भर करता है जिन्हें उसूल–ए–तशख़ीस कहा जाता है जो तशख़ीसी दला ईल द्वारा स्थापित किया जाता है। इसी प्रकार यूनानी चिकित्सा पद्धति जोड़ो के रोगों में निदान के लिए एक विशिष्ट तशख़ीसी दला–ईल रखती है। यह अख़लात की सहभागिता पर आधारित है जोकि जोड़ो के रोग के निदान में महत्वपूर्ण होता है। सु–ए–मिज़ाज के मूल्यांकन में बोल–ओ–बराज़ की जांच भी आवश्यक भूमिका निभाती है। रोगी का वृत्तांत, जांच, जीवनशैली, निवास स्थान, वंशानुक्रम, और अन्य पूर्वगामी कारकों को गठिया के निदान में प्रमुख माना जाता है।

इस प्रारूप में अख़लात को चार विभिन्न रंगों में दर्शाया गया है (लाल रंग दम के लिए, पीला रंग सफ़रा के लिए, चन्दन रंग बलगम एवं सुरमई रंग सौदा के लिए) दर्शाया गया है। वास्तव में यह प्रश्नावली का एक रूप है जिसमें प्रत्येक प्रश्न का उत्तर रोगी द्वारा दिया जाना होता है। रोगी द्वारा दिये गए अधिकतर एक समान उत्तर संबंधित अख़लात के सु–ए–मिज़ाज का सूचक है। इसके अलावा इस पेपर में अख़लात की गुणात्मक और मात्रात्मक तीव्रता को दर्शाने के लिए बार ग्राफ प्रस्तुत किया गया है और गठिया के अन्य कारकों का पता लगाने के लिए आंकड़ों में अलग से उल्लेख किया गया हे।

शब्दकुंजीः गठिया, निदान, रोग, प्रारूप, अख़लात।

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