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EVALUATION OF A UNANI FORMULATION IN THE TREATMENT OF OSTEOARTHRITIS AND ITS ANTIOXIDANT ACTIVITY

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ABSTRACT: Background - Guggul has the marked anti-arthritic effect, comparable to that NSAID & certain steroids. Guggul is beneficial for rheumatism especially rheumatoid arthritis. It helps in stimulating the regeneration of nerve tissue & cartilage in the joint space. *Guggul* significantly lowers triglycerides, cholesterols, LDL, VLDL. *Guggul* has been found in reducing the risk of coronary artery disease and now a days used in treating Hypothyroidism, BPH and autoimmune disorders. In this study it has been observed that *Majoon-e-Jograj Gugal* plays an important role in reliving the osteoarthritis & is also a drug of choice in rheumatism, its role as antioxidant seems warranted in protecting the biological tissues. Aim – Role of *Majoon-e-Jograj Gugal* in Osteoarthritis and its antioxidant activity. Materials and Methods – The study is single group open clinical study. Thirty patients were selected from general OPD of research centre & screened before undergoing the scientific study. The drug was given orally 5 gm. bid for a period of eight weeks. Result - The patients where symptoms free and did not develop any deformity. The serology of the patients did not change however the ESR level was reduced and attained normal level in most of the patients. Conclusion - In this study, the Unani treatment module was found to be effective in reducing the severity of disease. The drug was well tolerated and did not show any side effect after repeating the safety profile.

KEYWORDS: Osteoarthritis, Rheumatoid arthritis (RA), *Majoon-e-Jograj Gugal*, Antioxidant.

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1. INTRODUCTION

Osteoarthritis, the most common form of arthritis, is a public health problem throughout the world. [1] The third most leading cause of disease burden, measured as disability-adjusted life years in the world and predicted to increase over the years will place an increasing burden on society as the population ages. [2] Like metabolic disorder, increased local mechanical stress, wear and tear, post traumatic, traumatic alignment, incongruity of joint, oxidative stress has been found to be involved in the pathogenesis of OA. Alteration in the oxidant and antioxidant status is known to occur in the rheumatic diseases. [3, 4] Number of studies has laid the stress upon the involvement of oxidative stress in the pathogenesis of osteoarthritis. [5, 6, 7, and 8] In Unani literature, osteoarthritis is described under the broad entity *Waj-ul-Mafasil* which encompasses entire joint disorders. *Waj-ul-Mafasil* (pain in joints) is the term used for pain, inflammation, accumulations, depositions and other disorders of the joints (*Ibn-e-Sina* (980-1037). As per the Unani system of Medicine, derangement of the temperament of the four humors of the body is responsible for the occurrence of disease. [9] The classification of *Waj-ul-Mafasil* can be done on various factors based on the following [9] Presence or absence of morbid material in the joint, type of humour involved in the morbid material, involvement of the types of joints involved, severity of symptoms, course of diseases, presence of factors which may complicate prognosis. Osteoarthritis commonly affects the hands, feet, spine, and the large weight-bearing joints, such as the hips and knees.[10] Osteoarthritis is the most common cause of a joint effusion of the knee.[11] In smaller joints, such as at the fingers, hard bony enlargements, called Heberden's nodes (on the distal interphalangeal joints) or Bouchard's nodes (on the proximal interphalangeal joints), may form, and though they are not necessarily painful, they do limit the movement of the fingers significantly. Osteoarthritis of the toes may be a factor causing formation of bunions**,** rendering them red or swollen. [12] Damage from mechanical stress with insufficient self-repair by joints is believed to be the primary cause of osteoarthritis. Sources of this stress may include misalignments of bones caused by congenital or pathogenic causes; mechanical injury; excess body weight; loss of strength in the muscles supporting a joint; and impairment of peripheral nerves, leading to sudden or uncoordinated movements.[13] A number of studies have shown that there is a greater prevalence of the disease among siblings and especially identical twins, indicating a hereditary basis.[14] Changes in sex hormone levels may play a role in the development of osteoarthritis as it is more prevalent among post-menopausal women than among men of the same age.[15, 16] Increased risk of developing knee and hip osteoarthritis was found among those who work with manual handling (e.g. lifting), have physically demanding work, walk at work, and have climbing tasks at work (e.g. climb stairs or ladders). For knee osteoarthritis in particular, increased risk was found among those who work in a kneeling or squatting position. [17]

Unani classification of *Waja-ul-Mafasil*

Waja-ul-Mafasil has been classified by the eminent Unani physicians on various criteria, which are given under:-

1.1.Depending on the severity of clinical features and duration of disease:

1.2.*Haad* (Acute)

1.3. *Muzmin* (Chronic)

2.1Depending on the humoural derangement:

2.2. *Har* (Hot)

2.3. *Barid* (Cold)

2.4. *Yabis* (Dry)

3.1. Depending on etiology:

3.2.*Waja-ul-Mafasil Sadah*

3.3.*Waja-ul-Mafasil Maddi*

3.4.*Waja-ul-Mafasil Rehi*

3.5.*Waja-ul-Mafasil Ufooni*

4.1.Depending on the type of Ma'dda (Morbid material), *Waja-ul-Mafasil Maddi* can be further classified as:

4.2.*Waja-ul-Mafasil Damvi* (Sanguinous)

4.3.*Waja-ul-Mafasil Safravi* (Bilioous)

4.4.*Waja-ul-Mafasil Balghami* (Phelgmatic)

4.5.*Waja-ul-Mafasil Saudavi (Melancholic)*

5.1. Depending upon the joint involved:

5.2.*Irqu-un-Nisa* (From hip radiating downwards)

5.3.*Niqras* (Ankle and other joints of foot)

5.4.*Waja-ul-Zahr* (Back)

5.5.*Waja-ul-Warik* (Hip Joint)

5.6.*Waja-ul-Rukbah* (Back) [18-26,34-46]

6.1.According to Azam khan following the classification given by *Ibn-e- Sina* added one more aspect as follows:

6.2.*Waj-ul-Mafasil Mufrad*:- in which accumulation of only one humor is found

6.3.*Waj-ul-Mafasil Murakkab*:- in which more than one humor are found to be involved

7.1. According to *M Azam Khan*, the classification has been described on the basis of temperamental imbalance as *Wajaul Mafasil Sada*, which is caused by *Su-e-Mizaj Maddi* which is accompanied by the humoral imbalance and is being further divided into three types:

7.2. ***Wajaul Mafasil Mufrad*** This type of *Wajaul Mafasil* is caused by the abnormal change in the one of the four humours and has been categorized into; *Wajaul Mafasil Balghami*, *Wajaul Mafasil Damvi, Wajaul Mafasil Safravi* and *Wajaul Mafasil Saudavi*.

7.3. ***Wajaul Mafasil Murakkab*** When the change is in more than one humour and at least two humours are involved i.e. *Safra (Yellow bile)* with *Sauda (Black Bile)*, *Dam (Blood)* with *Balgham (Phlagma), Dam* and *Safra* etc.

7.4.***Wajaul Mafasil Reehi*** This type of *Wajaul Mafasil* is caused by the *Reeh Ghaleez* literally meaning (Bad Gases).

Historical perspective of Osteoarthritis

Waja-ul-Mafasil is a compound Arabic word, comprised of two words, *Waja* and *Mafasil*. *Waja* (plural *Auja*) is an infinitive word which literally means pain or ache. *Mafasil* (singular *mafsal*) is an adverb of place which literally means joint. So the literal meaning of *Waja-ul-Mafasil* is joint pain. The history of *Waja-ul-Mafasil* is as old as the history of human being. It is said that even dinosaurs were afflicted by this disorder, whose history dates back 100 million years. Great historical personalities like Alexander the great 356-323 BC were also having this disorder. This disorder is well described in the old Egyptian, Unani and Roman classical medical literature. *Waja-ul-Mafasil* is one of the diseases that have been elaborated thoroughly in the Unani classical literature. [18] It is well described in the treatises of *Hippocrates* (460 BC), *Dioscorides* (70 AD), *Rufus* (117 AD), *Galen* (129-217 AD), *Feel Gharyoos* (465 AD), *Yuhana Bin Mas'waih* (812 AD), *Sabit Bin Qarrah* (836 AD), *Hunain Bin Ishaq* (838 AD) , *Rabban Tabari* (898 AD), *Majoosi* (930 AD), *Razi* (930 AD), *Nooh-ul-Qamar* (990 AD), *Masihi* (1010 AD), *Ibn Sena* (1037 AD), *Jurjani* (1137 AD), *Ibn Zuhr* (1162 AD), *Ibn Rushd* (1188 AD), *Mooosa Bin Maimoon* (1214 AD), *Samarqandi* (1232 AD), *Nafeen Bin Ewaz Kirmani* (1500 AD), etc. *Hippocrates* presented the first compendium on the disease known as *Kitab-ul-Mafasil*, while as *Dioscorides* (70 AD) described the disease in detail in his book *Kita-ul-Hashaish. Rufus* (117 AD) prepared the next compendium on the disease having title *Kitab Auja-ul-Mafasil*, while as Galen (129-217 AD) discussed the disorder in his book *Kitab-ul-Elal-wal-Amraz. Feel Gharyoos* (465 AD) has written treatises with the name of *Risala Fee Irqun Nisa* and *Risala Niqras*. *Yuhana Bin Mas'waih* (812 AD) in his books *Kitab-ul-Kamal wa Tama* and *Al Mushajjar ul Kabir*, and Sabit Bin Qarrah (836 AD) in his books *Auja-ul-Mafasil* and *Kitabul Dhakheera Fee Ilm-ut-Tib* described the causation and line of treatment in detail. *Hunain Bin Ishaq* (838 AD) in his book *Tarkeeb-ul-Advia* , *Rabban Tabari* (898 AD) in *Firdaus-ul-Hikmat*, Majoosi (930 AD) in *Kamil-us-Sina'ah*, Razi (930 AD) in *Kitab-ul-Hawi*, Nooh-ul-Qamar (990 AD) in his book *Ghena Muna*, Masihi (1010 AD) in *Kitab-ul-Miah* and Ibn Sena (1037 AD) in *Al Qanoon* described the disease is curable in initial stage, but on chronicity, it can only be relieved. Jurjani (1137 AD) in *Zakheera Khwarzam Shahi*, Ibn Zuhr (1162 AD) in *Kitab-at-Taiseer*, Ibn Rushd (1188 AD) in *Kitab-ul-Kulliyat*, Mooosa Bin Maimoon (1214 AD) in *Al Fusool*,

Samarqandi (1232 AD) in *Al-Asbab-wal-Alamat* and Nafeen Bin Ewaz Kirmani (1500 AD) in *Sharah Asbab-wal-Alamat* discussed the etiology, pathogenesis and principles of treatment in detail. [19-23, 27-32] According to Ibn Sena, "*Waja-ul-Mafasil* is the pain of joints which includes *Niqras* (Gout), *Irq-un-Nisa* (Sciatica) and other types of joint pains. [21] According to *Zakariya Razi*, "*Waja-ul-Mafasil* is one of those disorders which occur in the form of recurrent or paroxysmal attacks." Razi defines it as, "*Waja-ul-Mafasil* is a wide term that encompasses pain of joints, *Niqras* (Gout) and *Irq-un-Nisa*. It may have specific names accordingly to site. e.g., when the pain starts from hip and spreads down the length of leg then it is called as *Irq-un-Nisa*, and when it is in foot, it is named as *Niqras*." He further adds that this disease is caused by the accumulation of excessive fluid (*Ratubat*). [19, 24] According to *Alama Najeeb-ud-Din Samarqandi*, "*Waja-ul-Mafasil* is that pain and inflammation which is developed in the joints of the organs." *Alama Nafees* elaborates this statement that this condition occurs in the surrounding structures of joints like synovial membrane, cartilage, ligaments, tendons and muscles. [23] *Ismail Jurjani* states, "When the morbid material is accumulated in the joints of organs and results in the inflammation and pain, it is called *Waja-ul-Mafasil*." According to *Dawood Antaki*, most of the physicians call it *Marz-ul-Malook*. [33] Depending upon the joints involved *Waja-ul-Mafasil* is named accordingly as *Niqras* (Gout), *Waja-ul-Warik* (Ischial pain), *Irq-un-Nisa* (Sciatica), *Waja-ur-Rukbah* (Knee pain). [22, 25] Sometimes it also involves the jaws, ear ossicles and vertebrae and become complicated to be diagnosed. [25]

Antioxidant Property of different ingredients of *Majoon-E-Jograj Gugal*, their chemical composition & therapeutic Uses

Zingiber officinale

Z. officinale is known for its effect on the gastrointestinal system, and in traditional system of medicine. When used as a culinary herb, *Z. officinale* can be useful as a carminative, diuretic and antiemetic. [47] The dried rhizomes have been used as a primary ingredient for stomachic which are used to treat nausea, indigestion and flatulence. [48] In cases of abdominal pain, the ground rhizome is steeped in hot water and drunk. [49] Antioxidant activity of the methanol extract of *Zingiber officinale* was determined by Reducing power assay, Superoxide anion scavenging activity assay, Hydroxyl radical scavenging activity assay, Nitric oxide scavenging activity assay, DPPH free radical scavenging assay, and hydrogen peroxide method. Methods: Preliminary phytochemical screening revealed that the extract of *Z. officinale* possesses flavonoids, volatile oil and phenolic materials. *Z. officinale* has also been used as a popular respiratory aide. Decoctions of *Z. officinale* rhizome have been mixed with milk in order to suppress coughing. [50] In cases of persistent cough or bronchitis, the rhizome has been chewed raw .The overall antioxidant activity of *Z. officinale* extract might be due to its flavonoid, polyphenolic and other phytochemicals constituents. The findings of the present study suggested that *Z. officinale* could be a potential source of natural antioxidant that could have great importance as therapeutic agents in preventing or s lowing the

progress of aging and age associated oxidative stress. [51]

Halelah siyah

The fruit of *Terminalia chebula* Retz also called *Halelah siyah* in Unani system of medicine is being used for the treatment of different types of diseases and disorders since antiquity. *Terminalia chebula* Retz is called "the king of medicine" because of its extraordinary powers of healing with a wide spectrum of biological activity. *Terminalia chebula* Retz is prescribed alone or in combination with Emblic and Beleric Myrobalans in a vast number of diseases, and are called "triphala". *Terminalia chebula* Retz fruits contain astringent substances like gallic acid, chebulic acid, chebulanin, neochebulanic acid, ellegic acid, chebulagic acid, chebulinic acid, etc. Terminalia chebula Retz fruits contain astringent substances like Chebulic acid, chebulagic acid, corilagin and gallic acid· [52, 53] Tannins of *Terminalia chebula* Retz are of pyrogallol (hydrolysable) type. The various components of hydrolysable tannins are gallic acid, chebulic acid, punicalagin, chebulanin, corilagin, neochebulanic acid, ellegic acid, chebulagic acid, chebulinic acid, 1,2,3,4,6-penta-Ogalloyl- β-D-glucose, 1,6,-di-O-galloyl-D-glucose, casuarinin, 3,4,6-tri-galloyl-Dglucose, terchebulin. [54-57] Total tannin content of Terminalia chebula Retzfruit is 32%. [58] The fruits of *T. chebula* are reported to have hepatoprotective activity against CCl4 and tert-butyl hydroperoxide.[59]The fruits also display cytoprotective [60], antidiabetic [61, 62], antioxidant [63], antibacterial [64,65] ,anti-arthritic [66], hypo-cholesterolaemic [67] and anti-inflammatory activities. [68] Antioxidant activities increase proportionally with the polyphenol content, primarily because of their redox properties. [69] A 70% methanol extract of *T. chebula* fruits was found to have good efficacy in radical scavenging abilities [70]. In another report, chloroform, ethanolic n-butanolic and organic aqueous extracts were investigated for anti-lipid peroxidation, anti-superoxide radical formation and free radical scavenging activities [71] Chang and Lin reported antioxidant activities of water, methanol and 95% ethanol extracts of the air-dried fruit of *T. chebula*. [72]

Carum carvi

Carum carvi was used traditionally in different populations for many medical complains. It contained a wide range of chemical constituents. Essential and volatile oils, flavonoids, proteins, carbohydrate, many vitamins and trace elements. The previous studies showed that the seeds of the plant and its constituents exerted antimicrobial, anticancer, dyspepsia, flatulence, Carminative, Antispasmodic antioxidant, hypolipidemic, antidiabetic, analgesic, diuretic, bronchial relaxant effects and many other pharmacological activities. The major compounds occurring in caraway are carvacrol, carvone, α-pinene,limonene, γ-terpinene, linalool, carvenone, and *p*-cymene, whereas the major compounds occurring in cumin are cuminaldehyde, limonene, α- and β-pinene, 1,8-cineole, *o*- and *p*-cymene, α- and γ-terpinene, safranal and linalool. In aqueous and solvent derived seed extracts, diverse flavonoids, isoflavonoids, flavonoid glycosides, monoterpenoid glucosides, lignins and alkaloids and other phenolic compounds have been found.[73-78] Roots of caraway have also

been found to contain flavonoids.[79] The seed and root of caraway showed the presence of polyacetylenic compounds. [80] In a recent study, a nonspecific lipid transfer protein has been isolated from the cumin seed.[81]The cumin and caraway oils exhibited high antioxidant activity which has been attributed largely to the presence of monoterpene alcohols, linalool, carvacrol, anethole and estragol, flavonoids and other polyphenolic compounds.[82,83]

Picrorhiza kurroa

Picrorhiza kurroa is a well-known herb in Unani medicine. It shows antioxidant, anti-inflammatory and immunomodulatory activities, it is most valued for its hepatoprotective effect. The rhizomes are widely used against indigestion problems since ancient times due to improper digestive secretions. Two pure compounds, luteolin-5-O-glucopyranoside (1) and picein (2) were isolated from butanol extract through column chromatography. Butanol and ethyl acetate extract showed greater antioxidant activity. *P. kurroa* rhizomes are widely used against indigestion problems since ancient times due to improper digestive secretions [84]. The major glycoside is '*Kutkin*', which is a mixture of (picroside I and II) and possess significant hepatoprotective action. [85] The major uses of the plant are due to its hepatoprotective, anticholestatic, antioxidant, and immunomodulatory activity [86,89] there reported activities in the plant are against leucoderma, antiinflammatory, jaundice, fever and urinary diseases. [90] Medicinally, in rhizomes extracts of *P. kurroa*, antioxidant and antineoplastic activities have also been reported. [91]Comparative antioxidant activity of two different species i.e., *P. kurroa* and *P. scrophulariiflora* has also been studied. [92] Kutkin is the active principal of *Picrorhiza kurroa* and is comprised of kutkoside and the iridoidglycoside picrosides I, II, and III. Other identified active constituents are apocynin, drosin, and nine cucurbitacin glycosides.[93, 94] Apocynin is a catechol that has been shown to inhibit neutrophil oxidative burst in addition to being a powerful anti-inflammatory agent**,** [95] while the curcubitacins have been shown to be highly cytotoxic and possess antitumor effects.[96]

2. MATERIALS AND METHODS

The present study is single group open clinical study. Thirty patients were selected from general OPD of research centre & screened before undergoing the scientific study. The drug was given orally 5 gm. bid for a period of eight weeks no other drug or regimental therapy was given during this period.

Objectives of the study

I. To evaluate the efficacy and safety of a Unani formulation *Majoon-e- Jograj Gugal* in the treatment of osteoarthritis with special reference to its Anti-oxidant activity.
II. To provide the safe, patient friendly and toxicity free alternative therapy for the patients of osteoarthritis.

Place of study

The present study has been carried out at Regional Research Institute of Unani Medicine, University

of Kashmir, Hazratbal, Srinagar.

Duration of study

1 year

Duration of protocol therapy

8 weeks

Sample size

30

Inclusion criteria

1. Aged between 35 to 60 years
2. Male, Female & Transgender.
3. Patients diagnosed according to American College of Rheumatology Criteria for osteoarthritis of different joints will be selected [97-99] Patients with symptoms consistent with osteoarthritis of the joint involved for at least six months prior to screening.
4. Patients, who will be willing to discontinue all NSAIDs or other analgesic medication taken for any condition, will be included in the test group.
5. Willingness to sign the informed consent, follow the protocol and participate in clinical trial voluntarily.

Exclusion ccriteria

1. Pregnancy and Lactation
2. Diabetes mellitus
3. Renal dysfunction
4. Liver diseases
5. Gastrointestinal diseases(Peptic ulcer disease)
6. Other types of arthritis
7. IHD and hypertension
8. History of surgery of the joint involved
9. Patients who will be unable to read/or understand the WOMAC questionnaire form.

Subject selection

Subject has been selected according to the American College of Rheumatology Criteria for Osteoarthritis of the affected joint.

Investigations (Before and After Treatment)

I. CBC with ESR
II. Rheumatoid Factor, ASO, CRP & Serum Uric Acid
III. LFT
IV. KFT
V. Blood Sugar F/PP

VI. Serum Calcium

VII. ECG

VIII. X-ray of the affected joint

Route of administration

Oral

Dose of Unani formulation (Drug)

5 gm. twice a day 1 hrs. after Meal.

Table -01-Follow up

Patient has been followed up every after two weeks.

Visits	**Days**
Baseline	0
First Visit	14
Second Visit	28
Third Visit	42
Fourth Visit	56

Assessment of efficacy

Assessment of efficacy has been done by using the following parameters.

I. Clinical parameters

II. Visual analogue scale (VAS)

1. Radiological Investigation

X Rays of the affected joints has been taken before and after treatment to compare radiological changes (if any)

Withdrawal criteria

i. Failure to follow the protocol

ii. Noncompliance

iii. Any adverse reaction or untoward effects

Table 2: Distribution of Patients aaccording to *Mizaj*

S.No.	***Mizaj* (Temperament)**	**Number of Patients**
1	*Damwi* (Sanguineous)	4
2	*Safrawi* (Bilious)	6
3	*Balghami* (Phlegmatic)	18
4	*Saudawi* (Black Bile)	2
Total		**30**

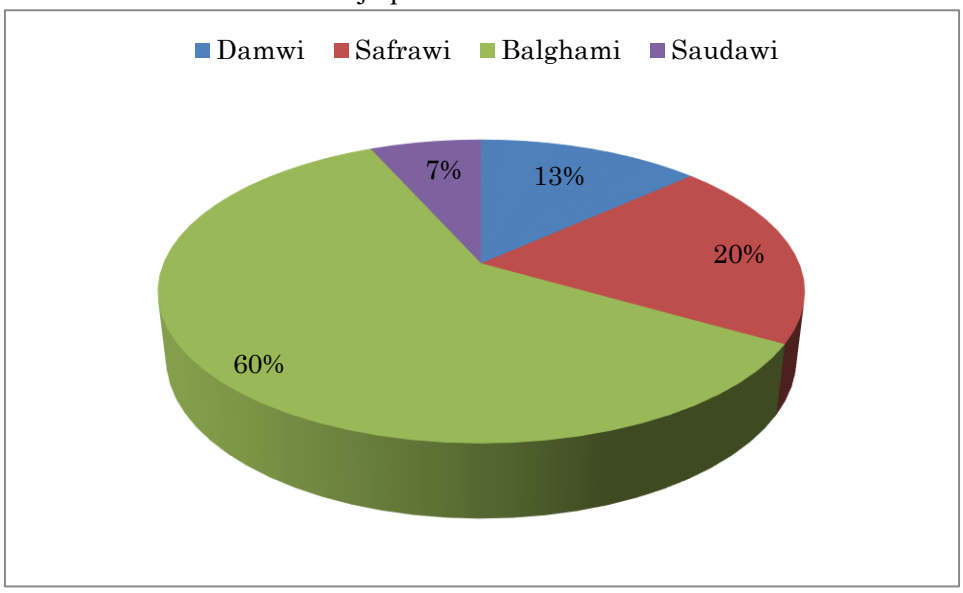

Figure 1: Percentage of Patients according to *Mizaj*

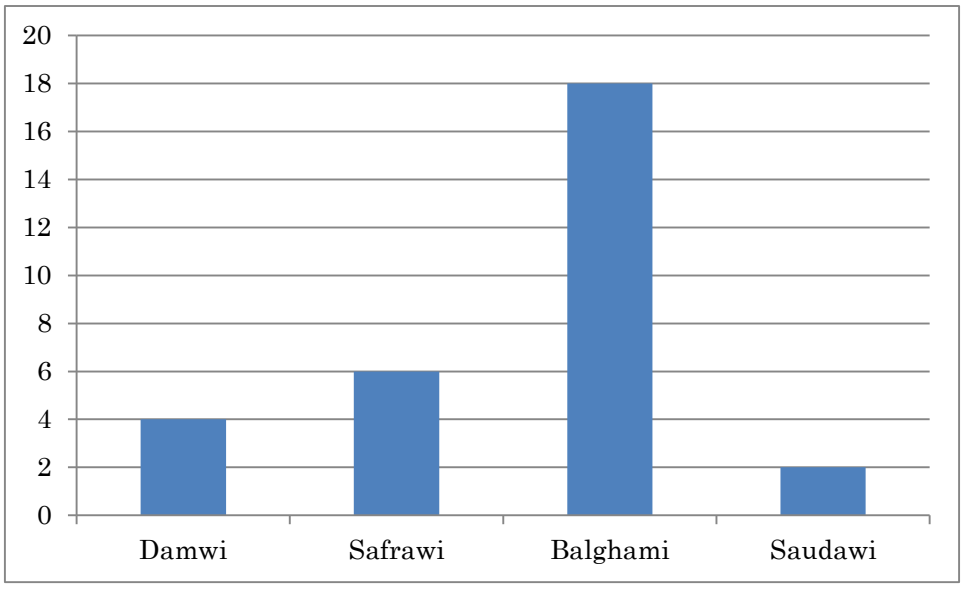

Figure 2: Number of Patients according to *Mizaj*

Table 3: Distribution of Patients according to Socio-Economic status

S.No.	Socio-economic Status	Number of Patients
1	Upper Class	3
2	Middle Class	11
3	Lower Class	16
Total		**30**

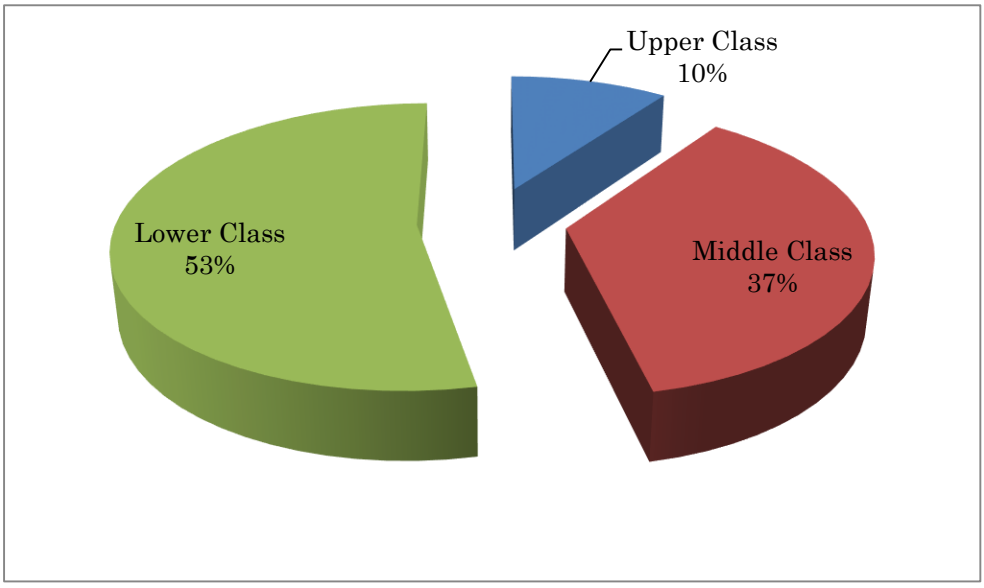

Figure 3: Percentage of Patients according to Socio-economic status

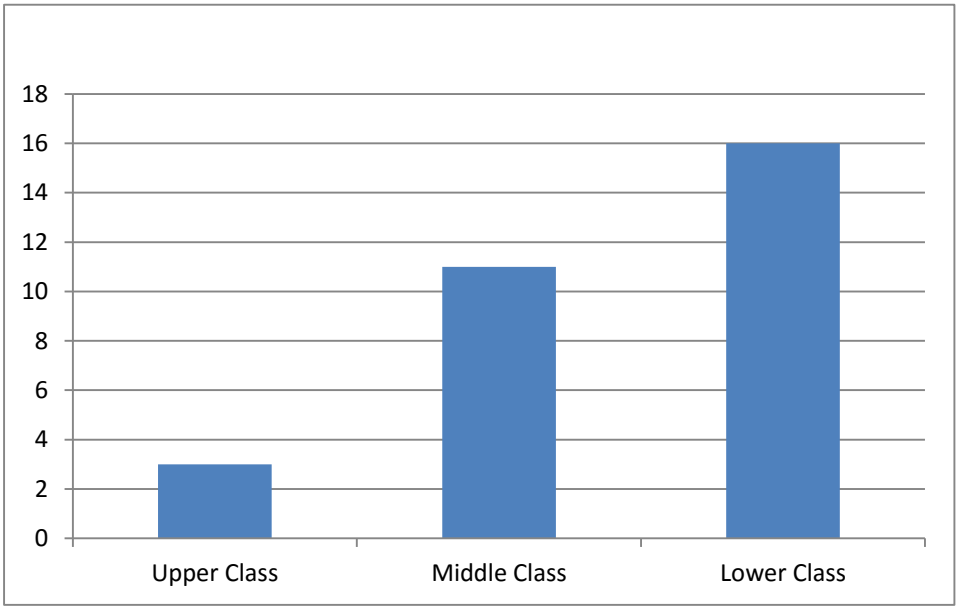

Figure 4: Number of Patients according to Socio-economic status

Table 4: Distribution of Patients aaccording to Sex

S.No.	Sex	Number of Patients
1	Male	12
2	Female	18
3	Transgender	0
Total		**30**

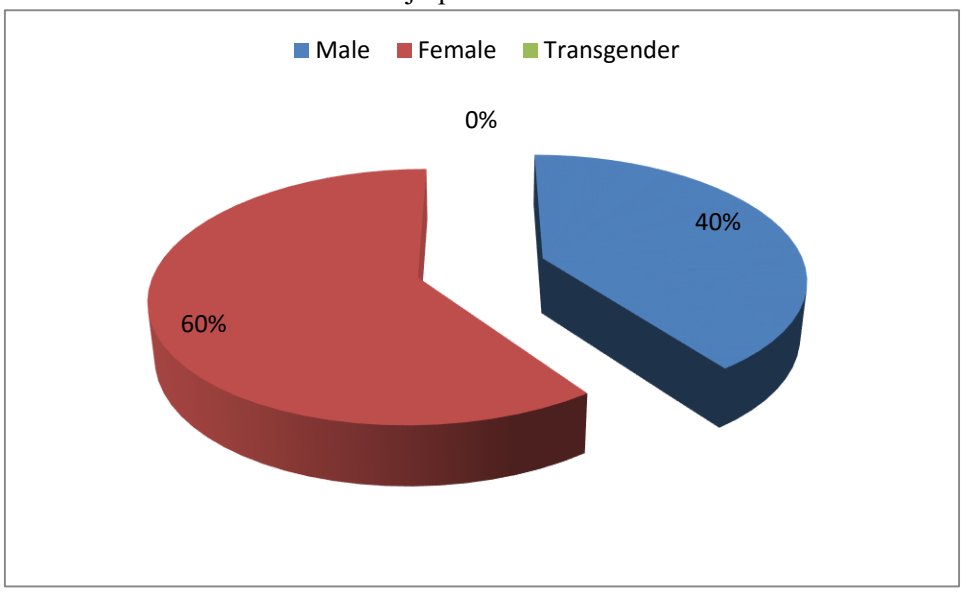

Figure 5: Percentage of Patients according to Sex

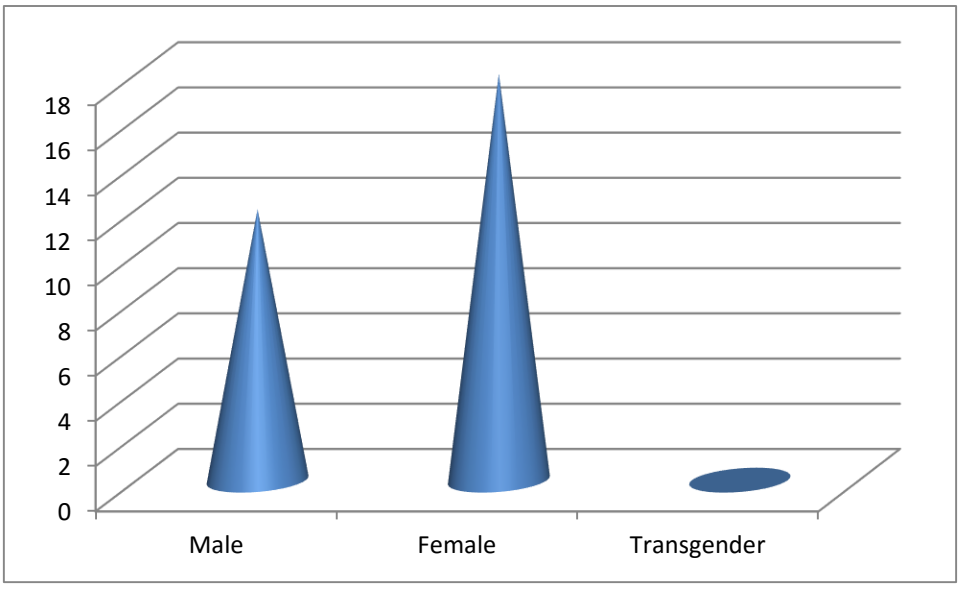

Figure 6: Number of Patients according to Sex

Table 5: Distribution of Patients according to age group

S. No.	Age Group	Number of Patients
1	35-40	6
2	41-45	13
3	46-50	9
4	51-55	2
5	56-60	0
Total		**30**

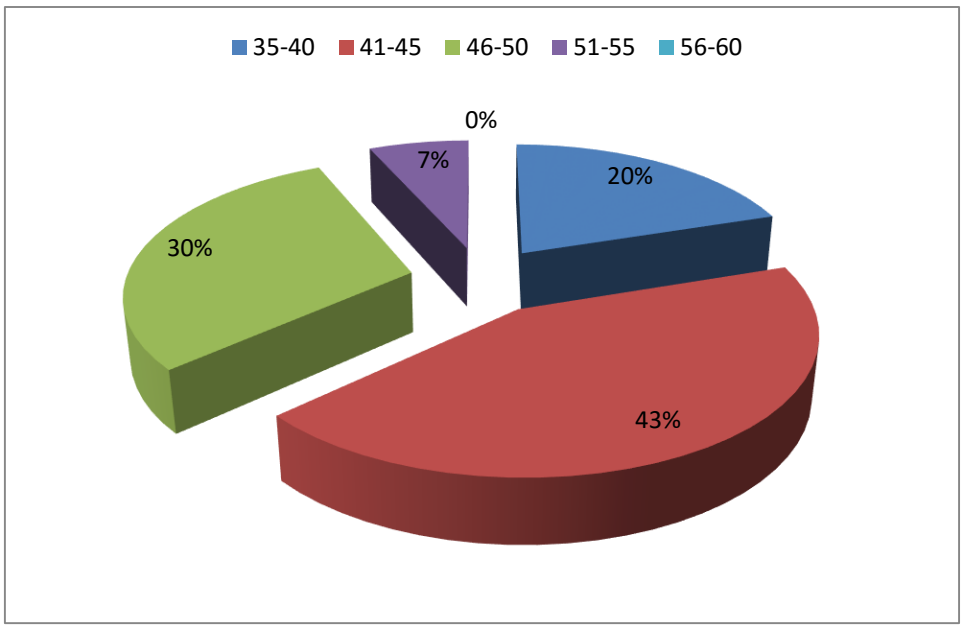

Figure 7: Percentage of Patients according to Age Group

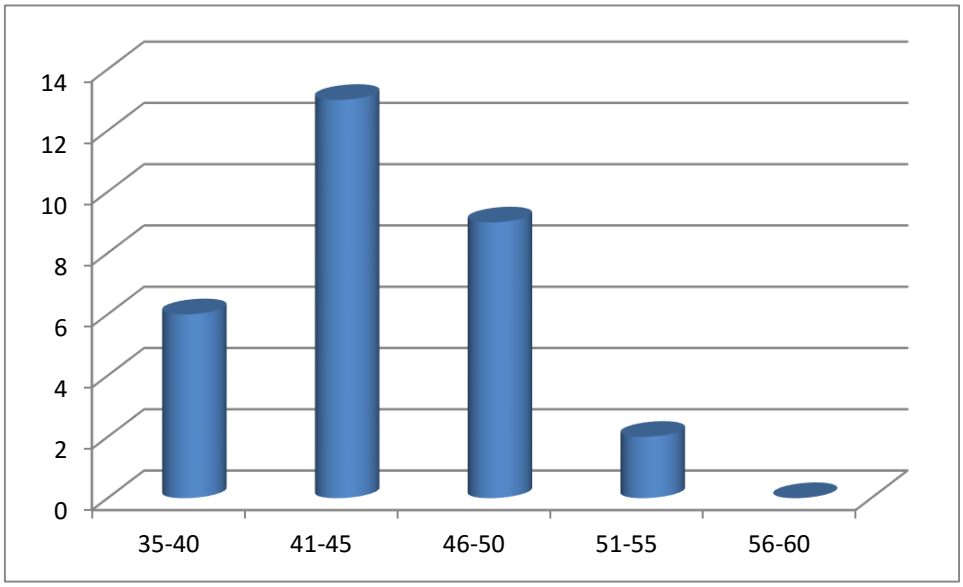

Figure 8: Number of Patients according to age group

Statistical Analysis

Table Analyzed	Data 1
Repeated Measures ANOVA	
P value	< 0.0001
P value summary	***
Are means signif. different? (P < 0.05)	Yes
Number of groups	5
F	667.2

R squared	0.9583

Was the pairing significantly effective?

R squared	0.01136
F	1.104
P value	0.3459
P value summary	ns
Is there significant matching? (P < 0.05)	No

ANOVA Table	SS	Df	MS
Treatment (between columns)	1866	4	466.4
Individual (between rows)	22.37	29	0.7715
Residual (random)	81.09	116	0.6991
Total	1969	149	

Tukey's Multiple Comparison Test	Mean Diff.	Q	Significant? P < 0.05?	Summary	95% CI of diff
Base line vs first visit	1.800	11.79	Yes	***	1.201 to 2.399
Base line vs second visit	4.333	28.39	Yes	***	3.735 to 4.932
Base line vs third visit	7.267	47.60	Yes	***	6.668 to 7.865
Base line vs Fourth visit	9.700	63.54	Yes	***	9.101 to 10.30
First visit vs Second Visit	2.533	16.60	Yes	***	1.935 to 3.132
First Visit vs Third visit	5.467	35.81	Yes	***	4.868 to 6.065
First Visit vs Fourth Visit	7.900	51.75	Yes	***	7.301 to 8.499
Second Visit vs Third visit	2.933	19.22	Yes	***	2.335 to 3.532
Second Visit vs Fourth visit	5.367	35.16	Yes	***	4.768 to 5.965
Third visit vs Fourth visit	2.433	15.94	Yes	***	1.835 to 3.032

It is quite clear from the above statistical analysis that there is a pairwise significant difference between the baseline and successive follow ups. Moreover it also shows that there is significant difference between the different follow ups (Visits). Hence the treatment is very effective to cure the said disease.

3. RESULTS AND DISCUSSION

The patients where symptoms free and did not develop any deformity. The serology of the patients did not change however the ESR level was reduced and attained normal level in most of the patients. The patients were not supported by any antioxidant therapy however no deficiency was noted.

In the Unani Classical literature the arthritis is being termed as *Wajaul Mafasil* which in broader terms means pain in joints. *Wajaul Mafasil* is used to describe all kinds of joint disorders including pain, swelling, and stiffness. It has been described as *Wajaul Mafasil Aam* (arthritis), *Wajaul Zuhr* (back pain), *Niqras* (gout) and *Irqun Nisa* (sciatica) etc *Wajaul Mafasil* is also seen in temporomandibular joints and vertebrae.As per the Unani doctrine, derangement of the humours occur due to the presence of morbid matters in the body and the blood circulation, which are responsible for the production of many diseases. Osteoarthritis is caused by derangement of humours, which are cold in nature like *Balghami* (phlegm), and *Saudavi* (black bile) humours. In this context, *Majoon-e-Jograj Gugal* has several advantages as the ingredients of the drug contains anti-inflammatory properties, anaesthetic properties, moreover they have the properties of eliminating bad matters which are accumulated in the joints by maturing the matters and eliminating by the way of *Istefrag* . Further *Majoon-e-Jograj Gugal* has the *muqawwiyat-e- mafasil* (strengthening the joints) actions too. The patients who were treated with this *Majoon-e-Jograj Gugal* got marked relief in pain and other symptoms of osteoarthritis. Moreover, experienced improved functional ability and day to day work. Highly significant improvement in the walking time after 4 weeks of treatment was noted. Therefore, the oral *Majoon-e-Jograj Gugal* therapy seems to be an effective treatment for reducing symptoms of knee osteoarthritis and restoring the physical functions & the therapy was found to be safe and well tolerated. However it is very important to work on large sample size for prolonged period to evaluate its remote side effect, if any, & other benefits. In present study, a maximum patient lies in the age group of 41-45 years followed by 46-50 years. And 18 cases are female and 12 cases are male. As per socioeconomic status maximum cases are present in lower class socioeconomic status. According to sign and symptoms joint pain, tenderness and swelling were present together in most of the patients and it was observed that patients with Phelgematic (*Balghami*) temperament were predominantly involved fallowed by Bilious (*Safrawi*), Sanguuinous *(Damwi)* and patients with Black bile (*Saudawi*) temperament.

4. CONCLUSION

In this study, the Unani treatment module was found to be effective in reducing the severity of disease. The drug was well tolerated and did not show any side effect after repeating the safety profile.

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CONFLICT OF INTEREST

There is no any conflict of Interest.

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