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Effect of Majoone Chobchini in Post Chikungunya Arthralgia - A Randomized Placebo Control Study

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ABSTRACT

Arthralgia is one of the common presentations in general practice and viral infection is one of the causes of arthralgia, which is typically self limiting and do not require any specific treatment, unless it prolong. Some of the viruses have predilection for the joints and arthritis is one of the common presenting sign of infection. Poly arthralgia is the most frequent chronic manifestation of post viral Chikungunya, required multi drug therapy to manage. Keeping in view of the indications of *Majoone Chobchini* as a drug of choice for *Wajaul Mafasil* and *Mussafi Dam*, it is hypothesized that it may found effective in post Chikungunya virus (CHIKV) arthralgia. Therefore, to evaluate the efficacy of *Majoone Chobchini* and to validate the claims scientifically this trial was conducted. This study was conducted as a single blind randomized placebo controlled trial on 30 patients of Post Chikungunya arthralgia where test group (n =20) and control (n=10) were received *Majoone Chobchini* and Placebo 5 gms each respectively twice a day after meal for thirty days. The study outcome was assessed as subjective parameters i.e., Pain in joints, swelling in joints, difficulty in movement and morning stiffness of joints at baseline, 8^{th}, $15^{th,}$ 22^{th} and 30^{th} day and objective parameters VAS, DAS, HAQ, CRP and ESR were assessed on pre and post study. The study effects on subjective parameters like (Pain in joints, swelling in joints, Difficulty in movement, Morning stiffness of joints) were found significantly reduced in comparison of control group, similarly the objective parameters (VAS, DAS-28, HAQ) were also found highly significant with $p<0.001$and CRP was found moderately significant with $p<0.016$ whilst an ESR ($p<0.373$) remained unchanged in both the groups. These results were assessed statistically using "t" test paired and unpaired, Fischer exact test, Mann Whitney U test and Wilcoxon Signed rank test This comparative clinical trial on post Chikungunya arthralgia reveals that *Majoone Chobchini* is effective in ameliorating joints pain was found statistically significant in comparison of placebo without any adverse effects. Therefore, it can be concluded that *Majoone Chobchini* can be used as drug of choice in the management of painful joins associated with viral infections also.

Keywords: *Majoone Chobchini;* Post Viral Chickungunya Arthalgia*; Wajaul Mafasil*

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INTRODUCTION

Arthritis or arthralgia as is common presentations to general practice and viral infection is one of the cause of arthralgia which is typically self-limiting and do not require any specific treatment, unless it proglong.[1]

Chickungunya is a disease which is caused by viral infection and is characterized by a sudden onset of high grade fever, rash and *arthralgia.*[2] The predominant symptom of *Chikungunya* infection is related to musculoskeletal system which is ranging from *arthralgia as* to *arthritis.*[3]

The spectrum of post-Chikungunya rheumatic and musculoskeletal disorders includes multiple tendinitis and tenosynovitis, plantar fasciitis, mechanical disbalance in susceptible joints, tunnel syndromes, edematous polyarthralgia, rheumatoid arthritis, and psoriatic arthritis.[4]

Chikungunya virus (CHIKV) infection is one of the major cause of arthralgia, generally its symptoms starts 4-7 days after mosquito bite.[5] The acute phase is characterized by painful arthralgia, high fever, and myalgia, a prominent symptom seen especially in adult patients is arthropathy, which is manifested in metacarpophalngeal, wrist, elbow, shoulder, knee, ankle and metatarsal joints. It appears between 3-5 day after the onset of clinical symptoms and it can persist for many months and even years. An acute phase symptom usually disappears after two weeks. However, arthralgia may persist for weeks, months or even years. In chronic phase incapacitating arthralgia persists for months to years.[6] Although polyarthralgia is the most frequent chronic manifestation, forms with polyarthritis, tenosynovitis and enthesopathy are also common.[7]

Chikungunya virus was first isolated in the 1950s from patients in Tanzania with fever and arthritis which is also known as break-bone fever, means “that which bends up” in the Makonde language.[8] Chikungunya affect one million people per year and causes debilitating joint pain.[7] It is emerged as a major public health problem in many tropical countries of Africa and Asia. In 2005- 2006 an explosive outbreak of Chikungunya occurred in India affecting more than 1.4 million people in 13 states especially in southern India.[9] Narayan Shrihari et al., conducted a study on prevalence of Chikungunya arboviral infection in and around Bellary district, Karnataka from 2009-2011.[9] Sero positivity rate of Chikungunya was 24.75%. The number of positive cases were more in 2010 (28.04%), than 2009 (23.07%) and subsequently decreased in 2011 (19.05%). Male to female ratio was 0.98.[10]

Prevalence of Chikungunya was 6.6% in and around regions of Bijapur. More number of cases affected were in 2013 (8.5%) in decreasing order 2012 (7.5%), 2011 (4.6%) and 2014 (4.0%). Females (6.9%) were more affected compared to males (6.2%) and the majority of cases affected

were in age group of 15 to 40 (8.3%).[11] In the last 50 years there have been frequent outbreaks of CHIK V infection in southern Indian state in general and Karnataka in particular.

Musculoskeletal manifestations of disease have been shown to affect 4%-75% of those infected with CHIKV.[12]

Treatment of acute CHIK is symptomatic, whereas in chronic stages, different disease-modifying anti-rheumatic drugs (DMARDs) have been used with variable success.[13] Treatment is generally symptomatic with analgesics and anti-pyretic, NSAID, and steroids, Methotrexate, Sulfasalazine, Hydroxychloroquine etc.[7, 14] Currently there are no vaccines or anti viral drugs for prevention or treatment of CHIKV infection.[15]

The concept of infection (*Ufunat*) and the diseases are well described in Unani literature under the heading of *Hummayat* (fevers). One of the types of *humma* is of *Hummae Khilti* (humouric fever), where the *khilt* (madda/humour) get affected with infection and causes fever, the characteristics of such fever is attributed as *Maleela*, *Qash'areera*, *Takas'sur* etc.[16, 17,18]

The symptoms of Chikungunya resembles with the symptoms of *Hummae Khilti* (humouric fever), as per the doctrine of Unani system of medicine either the fever resolves or it took a shape of crisis *(Buhran)*, mostly fever resolves to an end, otherwise, certain fevers will adopt one of the form of crisis (*buhran–inteqali*-the crisis of a disease transforms into other diseased condition). The symptoms of *buhrane Inteqali* manifested in the form of epistaxis, or local irritation, pain full joints, *Istirkha* (atony/flaccidity), Tashannuj (cramp/convulsion/spasm), etc.[19] *Waja'al-Mafasil*(polyarthritis) is one of the characteristic of *buhran inteqali* in certain fevers (*Hummae Khilti*).

The painful conditions of joints are described as *Waja'al-Mafasil* (polyarthritis) in Unani Medicine, accordingly based on the involvement of the joint they have been termed differently. Irrespective of the cause of painful joints, they have been treated with several single drugs like Suranjaan (*Colchicum autumnale Linn.*), Asgand (*Withania somnifera* Linn.), Kundur (*Boswellia serrata* Roxb.), Muqil (Commiphora mukul (Stocks) Hook.), Boazidaan (*Tanacetum umbelliferum* Boiss.) etc.[19,20,21,22,23,24,25] and compound formulations such as Majoon Suranjan, Majoon Jograj Gugal, Majoon Ushba, Habbe Muquil, Habbe Suranjan, Safoof-e-Chobchini, Safoofe Suranjaan, Habbe Mufasil, Majoon Gheeghawar, Jawarishe Hindi, Habbe Sibr, Majoone Azraqi etc.[26,27]

In this study *Majoon-e-Chobchini* has been selected based on its ingredients and as per the indications for the conditions like *Tasfiya al-Dam* (purification of blood) and *Waja'al-Mafasil*

(polyarthritis), and Hypothesized that this formulation may found to be effective in alleviating the pain of joints as well as it helps in elimination of blood impurities.

Objective

To evaluate the Effect of *Majoone Chobchini* in Post Chikungunya Arthralgia

MATERIALS AND METHOD

The present clinical study entitled "Effect of *Majoone Chobchini* in Post Chikungunya Arthralgia - A Randomized Placebo Control Study" was conducted at OPD and IPD of National Institute of Unani Medicine Bangalore. Hence, a randomized single blind with placebo controlled study was envisaged. Where 30 patients were randomly allocated in test (n=20) and control group (n=10), and patients of test group was treated with 5grams of *Majoone Chobchini* twice a day with water after meal, and the control group was given Placebo 5gm twice a day with water after meal, for 30 days.

The efficacy of study (outcomes) was assessed in the form of subjective and objective parameters viz Pain in Joints, Swelling in joints, Difficulty in movements and Morning stiffness in joints, and VAS, DAS-28, HAQ, ESR and CRP.

This study evidences that the intra group analysis reveals that the test group was found highly significant with p value <0.001 and control group was found insignificant with P>0.05 in subjective parameters. Whereas, the objective parameters VAS intra group pre and post treatment shows both test group and control group were highly significant with the p value <0.001, with superior effect from the test group, similarly DAS-28[28] also shows that the test group was found highly significant with p value <0.001 and control group suggestive significant with p value 0.082. Whereas HAQ[29] the intra group pre and post treatment shows both test group and control group were found highly significant with p value <0.001, But test group shows superiority in responses over control group in term of mean difference. ESR was assessed in the test group and control group were significant with the p value 0.119 and .898 respectively, similarly CRP in the test group and control group were significant with the p value 0.302 and 0.022 respectively but test group shows superiority in responses over control group in term of mean difference

The study data was analyzed statistically with "t" test paired and unpaired, Fischer exact test, Mann Whitney U test and Wilcoxon Signed rank test

Based on the outcomes of the study it can be concluded that this study is found to be effective in managing the pain associated with viral arthralgia, where test drug *Majoone Chobchini* is comparatively found safe and effective without any adverse effects. The probable effect of the drugs can be attributed to ingredients like Chobchini (*Smilax China* Linn.), Jadwar (*Delphinium*

denudatum Wall.), Khulanjan (*Alpinia galangal* Linn.), Abresham (*Bombyx Mori*), Gul-e Gaozaban (*Onosma bracteatum* Wall.) etc., present in test formulation performance *Musakkine A'lam*(analgesic), *Daf-e-Iltehab* (anti-inflammatory), *Musaffi Dam* (blood purifier), *Daf-e-Humma* (anti-pyretic), activities.

Prior to the beginning of clinical trial, the protocol was submitted to Ethical committee of National Institute of Unani Medicine and ethical clearance was obtained from the Institutional Ethical Committee, vide NIUM (NIUM/IEC/2016-17/003/Moal/03) on dated 18-05-2017. The trial was registered in the Clinical Trial Registry of India under number (CTRI/2018/02/011836). The clinical study was started by enrolling eligible patient from OPD and IPD of National Institute of Unani Medicine into test and control groups by random allocation. The study was conducted from May 2018 to October 2018. A total of 75 patients were screened out of which 36 patients were randomly allocated into test (Group A) and control (Group B) groups respectively but 4 patient from test group and 2 patient from control group were lost to follow up leaving behind 20 patient in test group and 10 patients in control group were completed the study. Statical analysis was done on 30 patients who have completed the course of duration. The study protocol comprises of following sub headings.

Criteria for selection of cases:

Inclusion criteria:	**Exclusion criteria**	**Subjective parameters**	**Objective parameters**	**Investigations**
-Either gender -Patients age between >18– <60 years -Clinically diagnosed cases of arthralgia / arthritis followed Chikungunya infection -Complain of multiple joint pain for more than 3 months with history of Chikungunya fever	-Age <18 >60 -Multiple joint pain due to other than Chikungunya infection -All systemic and metabolic diseases	-Pain in joints -Swelling in joints -Difficulty in movements -Morning stiffness of joints	-VAS (Visual Analogue Scale) -DAS-28 (Disease Activity Scale)[31] -HAQ (Health Assessment Questionnaire)[32] -ESR -CRP	-Hb%, TLC, DLC,ESR Random Blood sugar -CRP -RA -ASO -IgM -KFT (Blood Urea, Serum Creatinine) -LFT (ALT, AST, Alkaline Phophsatase) -ECG -Urine--Routine &Microscopic

Assessment of Temperament (*Mizaj*):

Determination of temperament (*Mizaj*) (Annexure-I) was done based on the *Ajnas-e-Ashra* (10 different parameters) mentioned in Unani literature. These parameters have been shown in the table attached with the case report form in annexure.

Method of Collection of Data:

- Clinical interview
- Laboratory investigations

Informed consent: Patients coming under the inclusion criteria mentioned above were given the information sheet having details regarding the nature of the study, the drug to be used, method of treatment etc and explained verbally also. Patients were given enough time to go through the contents of informed consent sheet. They were given the opportunity to ask any question and if they agreed to participate in the study, they were asked to sign the informed consent form.

Study design: A Randomized Single Blind Placebo Controlled Clinical Study.

Sample size: The sample size was 30 patients. 20 in test group and 10 in control group

Duration of protocol: The duration of protocol was 30 days.

Test drug: Composition of Research Drug: - *MajooneChobchini*

The ingredients of ***MajooneChobchini***

S. NO	Common Name	Scientific Names	Quantity
1	Chobchini	*Smilax china*	250 g
2	Khusyat -us Salab	*Orchis mascula*	50 gm
3	Khulanjan	*Alpinia galanga*	40gm
4	Gul-e-Gaozban	*Borago officinalis*	25gm
5	Behman Safaid	*Centaurea behen*	25gm
6	Behman Surkh	*Salvia haematodes*	25gm
7	Shaqaq-ul Misri	*Pastinaca secacul*	25 gm
8	Abresham	*Bombyx mori*	15 gm
9	Mugas	*Litsea chinensis*	15gm
10	Jadwar	*Delphinium denudatum*	10 gm
11	Qand Safaid	*Saccharum officinarum*	1.5 Kg

As per the Good Manufacturing Practice, Majoon was prepared under the guidance of Chief Pharmacist at NIUM Pharmacy, Bangalore

Dosage administration

Test Group: *MajooneChobchini* 5gm twice a day with water after meal

Control Group: Majoon like Placebo 5gm twice a day with water after meal

Follow up during treatment: Patients were kept under strict observation and advised to come weekly in OPD for the assessment of disease till the completion of study. Thirty days study was divided into four visits of follow up, which were made at an interval of 7 days. At every visit, patients were asked about the progression or regression in their symptoms, and subjected to assess the clinical findings.

Selection of subjects: After the screening, during the selection of the patients, complete history including general physical and systemic examination was carried out and recorded on a prescribed

case report form which was designed according to the objectives of the study. A detailed history was recorded regarding their chief complaints with duration, age, sex, religion, marital status, occupation, address, socioeconomic status based on Kuppaswamy's socioeconomic scale. Personal history, treatment history, past history of diseases and family history were also recorded. After history taking, general physical examination was done with special emphasis on height (in cm), weight (in kg), pulse rate/minute; blood pressure in mm of Hg, Any other positive finding during general physical examination was recorded in CRF. Likewise, a careful systemic examination of cardiovascular system, respiratory system, renal system, gastrointestinal system was also done to look for any findings of other serious illness. After that detailed examination specific to the diabetes mellitus was carried out in all the patients.

Withdrawal criteria:

- Failure to follow the protocol therapy.
- The cases in which adverse drug reaction is noticed

Procedure of study:

Patients complaining of multiple joints pain after Chikungunya infection were screened and those fulfilling the selection criteria after obtaining written informed consent were randomly allocated into two groups viz test and control. Test group were served with test formulation *Majoon* in 5 grams twice a day with water after meal, and control group was served with placebo in the same quantity for 30 days. In case of exaggerate condition of patient symptom during the trial rescue medication Paracetamol 650 mg tablet will be given and separate record on the number of rescue medication used were documented and taken care for analysis of study outcome. The study outcomes were assessed subjectively and objectively with reference to the data obtained after the treatment were compared with baseline finding. The outcome differences were subjected to statistical analysis with appropriate tests.

General physical and systemic examination was carried out. All the data was recorded in the CRF designed on the basis of objectives of the study. In addition patients were enquired about their demographic details and socioeconomic status was assessed by using Kuppaswamy's Socioeconomic Status Scale (Modified for 2017) (Annexure-II)

Assessment of efficacy:

Assessment of efficacy was based on the subjective and objective parameters. Subjective parameters included Pain in joints, swelling in joints, Difficulty in movements and Morning stiffness of joints and Objective parameters included VAS (Visual Analogue Scale), DAS-28 (Disease Activity Scale),[28] HAQ (Health Assessment Questionnaire)[29] ESR and CRP. The

subjective parameters were assessed at every visit, while as objective parameters were assessed before and after completion of trail. An arbitrary grading scale was adopted for the assessment of morning stiffness, difficulty in movement. Swelling of the joint was assessed as measurement in cm on present and pain in joint was assessed by VAS scale

RESULTS AND OBSERVATION

Pain, Swelling, Difficulty in movement & Morning stiffness in joints:

The effect of the study on "Pain, Swelling, Difficulty in movement & Morning stiffness in joints" were assessed with arbitrary grading scale, where the mean±SD scores with the difference was observed from the before treatment to 1st, 2nd, 3rd follow up and after treatment as shown in **Table No 1 & 2**. The pre and post treatment findings were compared statically using Between Group: Mann Whitney U test; Within Group: Wilcoxon Signed rank test.

The mean Pain & swelling in joints score in test group at 2nd follow up,3rd and after treatment was observed highly significant with $p<0.001$whereas in control group it was found insignificant with p value $p>0.005$

The inter group comparison of pain & swelling shows that test group is statically highly significant with p value 0.005 in pain and p value 0.002 in swelling at after treatment in comparison of control group.

The mean Difficulty in movement and mean Morning stiffness of joints score in test group at 2nd follow up, 3rd and after treatment was observed highly significant with p value 0.004, 0.002 and 0.002 in Difficulty in movement and p value 0.001, <0.001 and <0.001 in Morning stiffness of joints respectively; whereas in control group it was found insignificant with p value $p>0.005$ in both Difficulty in movement and mean Morning stiffness of joints.

The inter group comparison shows that test group is statically highly significant with p value 0.001 & 0.004 at after treatment in comparison of both control group difficulty in movement and mean Morning stiffness of joints respectively.

So this improvement may be attributed due to ingredients present in test formulation performance *Musakkine A'lam* (analgesic), *Daf-e-Iltehab* (anti-inflammatory), *Musaffi Dam* (blood purifier), *Daf-e-Humma* (anti-pyretic), activities which are explained by Ibn-e Sina (Avicenna 980-1037 ADE), Ibn al-Bayṭār (1197–1248 ADE), Hakim Azam Khan (1815-1902 ADE), Hakim Najmul Ghani (1859-1899 ADE).[2,17,19,22,30,31,32,33] Astilbin, a flavonoid compound found in Chobchini which reduce the swelling of joint and also acts as antioxidant and immunomodulator activity.[34]

VAS (Visual Analogue Scale), DAS-28 (Disease Activity Scale) & HAQ (Health Assessment Questionnaire):

The effect of the study on "Visual Analogue Scale, Disease Activity Scale & Health Assessment Questionnaire" were assessed with arbitrary grading scale, where the mean±SD scores with the difference was observed from the before treatment to 1st, 2nd, 3rd follow up and after treatment shown in **Table 3** The pre and post treatment findings were compared statically using Between Group: Mann Whitney U test; Within Group: Wilcoxon Signed rank test. The mean Visual Analogue Scale score in test group at 2nd follow up, 3rd and after treatment was observed highly significant with p value 0.001, <0.001 and <0.001 respectively whereas in control group it was found moderately significant with p value 0.025 at 2nd follow and in 3rd follow up and after treatment it was 0.005 and 0.009 respectively .The inter group comparison shows that test group is statically highly significant with p value ($p<0.001$) at after treatment in comparison of control group.

The mean DAS-28 score in test group at 2nd follow up, 3rd and after treatment was observed highly significant with p value ($p<0.001$) whereas in control group it was found moderately significant with p value 0.082 at after treatment. The inter group comparison shows that test group is statically highly significant with p value ($p<0.001$) at after treatment in comparison of control group.

The mean Health Assessment Questionnaire score in test group at 2nd follow up, 3rd and after treatment was observed highly significant with p value ($p<0.001$) whereas in control group it was found highly significant with p value ($p<0.001$) at after treatment. The inter group comparison shows that test group is statically highly significant with p value ($p<0.001$) at after treatment in comparison of control group.

So this results may be attributed due to ingredients present in test formulation performance *Musakkine A'lam* (analgesic), *Daf-e-Iltehab* (anti-inflammatory), *Musaffi Dam* (blood purifier), *Daf-e-Humma* (anti-pyretic), activities which are explained by Ibn-e Sina (Avicenna 980-1037 ADE), Ibn al-Bayṭār (1197–1248 ADE), Hakim Azam Khan (1815-1902 ADE), Hakim Najmul Ghani (1859-1899 ADE).[2,17,19,22,30,31,32,33]

The result may be due to analgesic and anti-inflammatory effect of *Majoone Chobchini* which is explained in Unani books.[27,105] This finding is due to analgesic, anti-inflammatory, anti-oxidant and Immunomodulator activity which was reported by Shahraki MR (2015) and Jiang J (2003) et al.[35]

Table 1: Effects of study on Pain & Swelling in Joints among groups

Effects of study on Pain in Joints among groups				Effects of study on Swelling in Joints among groups		
Pain in joints	**Test Group(TG)**	**Control Group(CG)**	**P value**	**Test Group(TG)**	**Control Group(CG)**	**P value**
Before Treatment	2.10±0.45	1.80±0.79	0.285	2.00±1.17	2.10±0.99	0.880
1st Follow up	2.10±0.45	1.60±0.52	0.055+	1.95±1.15	2.10±0.99	0.746
2nd Follow up	1.60±0.50	1.60±0.52	1.000	1.45±0.89	2.00±0.94	0.143
3rd Follow up	1.40±0.68	2.00±0.47	0.017*	0.70±0.98	2.10±0.99	0.003**
After Treatment	1.30±0.66	2.00±0.47	0.005**	0.40±0.75	1.90±1.10	0.002**
P value from BT						
1st Follow up	1.000	0.157	-	0.317	1.000	-
2nd Follow up	0.004**	0.317	-	0.001**	0.317	-
3rd Follow up	0.002**	0.480	-	0.001**	1.000	-
After Treatment	0.002**	0.480	-	0.001**	0.317	-

Between Group: Mann Whitney U test; Within Group: Wilcoxon Signed rank test

Table 2: Effects of study on Difficulty in movements & Morning Stiffness among groups

Effects of study on Difficulty in movements among groups				Effects of study on Morning Stiffness in Joints among groups		
Difficulty in movements & Morning Stiffness	**Test Group(TG)**	**Control Group(CG)**	**P value**	**Test Group(TG)**	**Control Group(CG)**	**P value**
Before Treatment	2.10±0.45	1.80±0.79	0.286	1.85±0.37	1.60±0.70	0.248
1st Follow up	2.10±0.45	1.50±0.53	0.019*	1.85±0.37	1.30±0.48	0.015*
2nd Follow up	1.60±0.50	1.80±0.63	0.502	1.25±0.44	1.60±0.52	0.131
3rd Follow up	1.40±0.68	2.10±0.32	0.005**	1.05±0.39	1.70±0.48	0.005**
After Treatment	1.25±0.72	2.00±0.00	0.001**	1.00±0.46	2.20±1.75	0.004**
P value from BT						
1st Follow up	1.000	0.180	-	1.000	0.180	-
2nd Follow up	0.004**	1.000	-	0.001**	1.000	-
3rd Follow up	0.002**	0.180	-	<0.001**	0.739	-
After Treatment	0.002**	0.414	-	<0.001**	0.380	-

Between Group: Mann Whitney U test; Within Group: Wilcoxon Signed rank test

Table 3: Effects of study on VAS, DAS & HAQ among groups

VAS				DAS			HAQ		
Parameters	**Test Group(TG)**	**Control Group(CG)**	**P value**	**Test Group(TG)**	**Control Group(CG)**	**P value**	**Test Group(TG)**	**Control Group(CG)**	**P value**
Before Treatment	6.30±0.85	6.55±0.76	0.350	28.30±8.39	28.60±4.99	0.918	1.33±0.20	1.30±0.21	0.700
1st Follow up	6.28±0.82	6.55±0.76	0.286	25.20±8.59	28.60±4.99	0.259	1.34±0.26	1.30±0.22	0.681
2nd Follow up	5.68±0.63	6.80±0.67	<0.001**	21.30±7.63	29.40±5.64	0.006**	1.04±0.21	1.42±0.23	<0.001**
3rd Follow up	5.33±0.73	6.95±0.72	<0.001**	16.70±8.09	31.30±5.25	<0.001**	0.92±0.39	1.41±0.22	0.001**
After Treatment	4.55±1.24	7.20±0.59	<0.001**	13.50±8.99	30.50±4.79	<0.001**	0.76±0.47	1.61±0.24	<0.001**
P value from BT									
1st Follow up	0.317	1.000	-	0.141	1.000	-	0.824	1.000	-
2nd Follow up	0.001**	0.025*	-	<0.001**	0.405	-	0.001**	0.106	-
3rd Follow up	<0.001**	0.005**	-	<0.001**	0.050*	-	0.001**	0.287	-
After Treatment	<0.001**	0.009**	-	<0.001**	0.082+	-	<0.001**	0.005**	-

Between Group: Mann Whitney U test; Within Group: Wilcoxon Signed rank test

Effects of study on ESR & CRP among groups

The Mean ± SEM score for ESR & CRP in test group were on 0th day and 30th day as shown in **Table No 4.** The pre and post treatment findings were compared statically using Between Group: Student t test (Unpaired); Within Group: Student t test (Paired. The p value in both intra and inter group of ESR was insignificant with p value (p>0.005) as well as p value in inter group of CRP was moderately significant with p value 0.016. It may due to *musaffi dam* activity of *Majoone Chobchini*.[30, 36]

Table 4: Effects of study on ESR & CRP among groups

	ESR			CRP		
	Test Group	**Control Group**	**P value**	**Test Group**	**Control Group**	**P value**
Before Treatment	40.80±24.42	24.10±16.62	0.062	14.33±34.06	5.27±3.60	0.413
After Treatment	33.05±24.52	25.00±19.15	0.373	6.58±5.63	14.26±10.83	0.016*
P value	0.119	0.898	-	0.302	0.022*	-

Between Group: Student t test (Unpaired); Within Group: Student t test (Paired)

Significant figures:

+ Suggestive significance (P value: 0.05<P<0.10)

* Moderately significant (P value: 0.01<P ≤ 0.05)

** Strongly significant (P value: P≤0.001

CONCLUSION

This study entitled Effect of *Majoone Chobchini* in Post Chikungunya Arthralgia – A Randomized Placebo Control Study was conducted in National Institute of Unani Medicine in Bangalore, on 30 patients by randomly allocating into test (n=20) and control group (n=10). Test group were subjects were treated with *Majoone Chobchini* and control group subje1cts were treated with Majoon like placebo, and both the groups were treated for 30 days with 4 follow-ups. The study effects on subjective parameters like (Pain in joints, swelling in joints, Difficulty in movement, Morning stiffness of joints) and the objective parameters VAS, DAS-28, HAQ, ESR and CRP were assessed. Both the interventions *Majoone Chobchini* and Majoon like placebo were treated to the patients but the effectiveness of the Majoone Chobchini is much higher than placebo. Based on the observations of this study, it can be concluded that the compound formulation *Majoone Chobchini* can be used in the management of post Chickungunya arthralgia. However, it is suggested to have further studies with different methodology and parameters on larger sample size to evaluate the effects of these treatments are not only symptoms modification associated with the disease but also in disease modification too.

Further, it is also suggested to carry the same kind of study with larger sample size and revised methodology to further validate the effects of the formulation, and it is also suggested that the same formulation can be compare with any of the drug having proven efficacy in this kind of disease.

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