Evaluation of Anti-arthritic and Analgesic Effect of Unani Formulation Qurs-e-Mafasil Jadeed: A Pre-clinical Study

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Abstract

This study has been conducted to find out anti-arthritic and analgesic activity of Qurs-e-Mafasil Jadeed containing *Colchicun luteum, Curcuma longa* and gum of *Acacia Arabica*. In this study 2% aqueous suspension of qurs/tablet powder in gum acacia was used to determine its anti-arthritic and analgesic activity by Freund's adjuvant arthritis test, Eddy's hot plate test and Analgesiometer test. Efficacy of this Unani formulation was compared with standard referent drug, Diclofenac sodium. The findings of this study as per Freund's adjuvant arthritis test, the lower, medium and higher doses of Aq. susp. of the test formulation were found to decrease the hind paw volume and ankle joint thickness significantly ($p<0.01$) as compared to the control group. Therefore, the study shows that all the three doses of aq. susp. of the test formulation possess a significant anti-arthritic activity. In Eddy's hot-plate test and Analgesiometer test, the demonstration of a striking increase in reaction time shows that all the doses of compound formulation possess a good analgesic activity.

Keywords: *Acacia Arabica,* Analgesic Activity, Anti-arthritic Activity, *Colchicum Luteum*, *Curcuma Longa*, *Qurs-e-Mafasil Jadeed.*

Introduction

Arthritis is creating a serious health crisis that affects millions of people of all ages, genders, races and ethnic groups – and it's growing. In India Arthritis affects 15% people i.e. over 180 million people in India. This prevalence is higher than many well known diseases such as diabetes, AIDS and cancer. WHO estimates that 4 billion people all over the world use herbal medicine. The discovery of medicinal benefit of vegetable extract leads to the isolation of active principle and its subsequent chemical characterization (Shetty, et al., 2008). Despite the potential of the plants to provide us with useful pharmaceutical agents, the field is still poorly studied. Only an estimated 5-10 % of the approximately 3-5 lakh plant species world-wide have been screened for one or more bioactivities (Mpala, et al., 2010). The Unani System of Medicine, an Indian variant of Greco-Arabic system is being practised in India for centuries; not only its simple medicaments but also the poly-pharmaceutical preparations have great significance in the treatment of Arthritis. There are many pharmacopoeial and non-pharmacopoeial preparations which produce significant anti-inflammatory, analgesic and anti-arthritic activity but yet to be scientifically studied. So there is a need to standardize physico-chemically and pharmacologically those formulations which have particular effect on diseases. Therefore, in the present study, pharmacological characteristics of a Unani compound formulation Qurs-e-Mafasil Jadeed (QMJ) mentioned in "Qarabadeen-e-Majeedi" (Anonymous, 1986) was investigated on the parameters

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of Anti-arthritic and Analgesic activity. According to the "*Qarabadeen-e-Majeedi*" the QMJ contains (i) Haldi (*Curcuma longa* Linn., Dried Rhizome- 25 g), (ii) Colchicum (*Colchicum luteum Baker*, Dried Corm- 25 g) and (iii) *Samagh-e-Arabi/Gum acacia* (*Acacia arabica* Linn., Dried Fine powder- 5 g). Gum acacia powder of S. d. Fine Chemical Ltd. was used. Two ingredients *Suranjan* and *Haldi* possess anti-inflammatory and anti-arthritic properties; *Samagh-e-Arabi/ Gum acacia* possesses qabiz and demulcent property. Suranjan has purgative (*Mushil-e-Balgham*) property also and many more actions are attributed to these drugs (Avicenna, 1998; Chopra et al;. 1958; Ghani, et al.; 2005; Hakim, 2002)

Material and Methods

Collection of Plant Material

The raw materials were purchased from the local market of Aligarh and the samples were authenticated in Pharmacognosy section of the Department of Ilmul Advia, Faculty of Unani Medicine, AMU, Aligarh and found within the range of standards as mentioned in the API, 1999, 2001 and UPI, 2007 (Anonymous, 2007; Anonymous, 1999; Anonymous, 2001). The two ingredients of the formulation Suranjan talkh and Haldi were powdered in an electric grinder and Samagh-e-Arabi/Gum acacia is used as powder (S.D.Fine Chemical Ltd). All the three ingredients were mixed together in order to make Lubdi (dough). The mixture was dried in shed and then powdered in a mortar. This powdered material in the requisite degree of finesse mixed and damped with a moistening agent (purified water) in sufficient quantity (Q. S). The moistened material was made into granules by passing through a sieve (12 No.). In this formulation some excipients like Sang-e-Jarahat and Magnesium sulphate in fine powdered form and Liquid paraffin in minute quantities (0.25-0.50 % w/w) were mixed in granules before passing it to the dye of tablet making machine for the purpose of anticacking, preservation, drying and lubrication after that the processed drug was passed through the sieve and 500 mg tablets were made by automatic tablet making machine in Dawakhana Tibbiya College, AMU (Anonymous, 1968; Anonymous, 1970; Anonymous, 1986). After making the tablet, the formulation was subjected to pharmacological studies.

Pharmacological Studies

Animal Maintenance

The present study was conducted on healthy albino rats of either sex weighing 150-200g. Animals were housed in groups of 6 animals in cages under hygienic conditions. All experiments were conducted during light phase between 8.00 and 13.00 hours. All the procedures were followed as per the guidelines of the International Association for the Study of Pain (Zimmernman, 1981). All the animals were fed standard animal diet and water, ad-libitum.

Drugs and Chemicals

Diclofenac sodium (Voveran, Novartis, India), Carrageenan Type II (Sigma chemical company, USA), Normal Saline (E. Merck Ltd, India) and 2% Aqueous Suspension of Qurs/tablets.

The present study was undertaken to evaluate the anti-arthritic and analgesic activity in healthy albino rats of either sex weighing 150-200g. Aq. Suspension (2%) of Qurs-e-Mafasil Jadeed was used for the study.

Preparation of Drug Suspension

The test formulation (tablets) was powdered and fresh suspension of tablet powder was prepared in distilled water with 2% gum acacia powder which was administered orally in the animal with the help of feeding canula after shaking the suspension well. The dose for the animal was calculated by extrapolating the human dose of test drug by conversion factor of 7 for rat (Frierich et. al, 1966). Hence, the three different doses selected for the study of aq. suspension of the test drug were 200 mg/kg, 300mg/kg and 400mg/kg.

Freund's Adjuvant Arthritis Test

It represents the chronic phase of inflammation. The effect of test drug for the established type of Adjuvant-induced arthritis was carried out by the method of Persico et al (1988). Albino rats (Wistar Strain) of same age, weighing 150 – 200 gm were divided into 6 groups of 6 animals each. The animals were maintained at uniform temperature, given standard diet and tap water, *ad libitum*. All the animals except in Group I were injected in the right hind paw, with 0.075 ml of Freund's Adjuvant, (1.0 mg of heat-killed and dried *Mycobacterium tuberculosis* (F-5881, 37H8910) in 0.85 ml of paraffin oil and 0.15 ml of mannide mono-oleate) (Difco Laboratories Detroit, Michigan, USA). The paw volume was measured with a digital plethysmometer on day 1 before injection of Freund's adjuvant and on day 11 and then on alternate days, from day 12 to 17 i.e. on 11^{th}, 13^{th} , 15^{th} and 17^{th} day. The thickness of the ankle joint was also measured by Digital Micrometer Screw Gauge according to a similar schedule. The animals in all the groups were administered with the treatment by oral route once a day for 5 days. Animals in Group I served as plain control while the animals in Group II were administered with 20ml/ kg distilled water. The standard drug Diclofenac Sodium was given to animals in Group III in a dose of 10 mg/kg. Group IV, V and VI were treated with 200 mg/kg, 300 mg/kg and 400 mg/kg of 2 % Aq. suspension of test formulation respectively. On the concluding day i.e. day 17, immediately after administering the treatment, the final measurements were taken. After one and a half hours of the treatment, the animals were sacrificed by cervical dislocation. The percentage of inhibition was found out by the following formula:

$$I = 100\left[1 - \frac{a - x}{b - y}\right]$$

Where

I = Percentage of inhibition

a = Mean right hind paw volume/ankle joint thickness of Test/Standard animals on Day 17.

b = Mean right hind paw volume/ankle joint thickness of control animals on Day 17

x = Mean right hind paw volume/ankle joint thickness of Test/Standard animals on Day 1.

y = Mean right hind paw volume/ankle joint thickness of control animals on Day 1.

The mean paw volume / ankle joint thickness was also compared statistically by one way ANOVA test followed by TUKEY.

Tests for Analgesic Activity

Eddy's Hot Plate Test

Eddy's Hot-plate Test was carried out by the method of Eddy and Leimbach (1952). Albino rats of either sex, weighing 150-200g were divided into 4 groups of 6 animals each. Animals in group I served as standard and was administered with Diclofenac Sodium in a dose of 10 mg/kg orally. Second, third and fourth group were treated with 200 mg/kg, 300 mg/kg and 400 mg/kg of 2 % Aq. Suspension of the tablets respectively. The initial reaction time of each rat was determined by putting the rats on Eddy's hot plate at 55-55.50°C. The time between placing of the animals on the hot plate and their jumping or licking of paws was taken as reaction time. The reaction time of each animal was recorded after 1 hour of drugs administration at 15-minute intervals for 90 minutes. The reaction time at each post treatment interval within a group was statistically compared with the initial reaction time by one way ANOVA test followed by TUKEY.

Analgesiometer Test

Analgesiometer test was carried out by the method of Davies (1946). Albino rats of either sex, weighing 150-200g were divided into 3 groups of 6 animals each. First, second and third group were treated with 200 mg/kg 300 mg/kg and 400 mg/kg of 2% Aq. suspension of test formulation respectively. The initial reaction time of each rat was determined by putting the tail on nichrome wire of Analgesiometer by putting the rat into rat holder. The variac was adjusted at a point where the reaction time was found to be 3-6 seconds and the corresponding variac reading was noted. The variac was set at the same point for subsequent

testing of a particular animal. The reaction of each animal was recorded at intervals of 15 minutes for 120 minutes. The reaction time at each post treatment interval within a group was statistically compared with the initial reaction time by one way ANOVA test followed by TUKEY.

Observations and Results

Freund's Adjuvant Test

The test for the established type of Adjuvant-induced arthritis was carried out on albino rats of both sexes, weighing 150-200 gm divided into 5 groups of 6 animals each. The groups were categorized as follows:

Group I- Control (Adjuvant + 20ml/kg distilled water)
Group II- Standard (Adjuvant + 10mg/kg Standard drug Diclofenac sodium)
Group III- Aq. Susp. 200 (Adjuvant + 200mg/kg Aq. Susp. of tablet)
Group IV- Aq. Susp. 300 (Adjuvant +300mg/kg Aq. Susp. of tablet)
Group V- Aq. Susp. 400 (Adjuvant + 400mg/kg Aq. Susp. of tablet)

All the animals were injected in the left hind paw with 0.075ml of Freund's adjuvant. The paw volume and ankle thickness were measured on day 1 and day 11 and after that on alternate days i.e. on Day 13, 15 and 17. The treatment was given from day 12 to 17, once a day, after overnight fasting. Mean increase in Paw volume and Ankle thickness with reference to initial volume and thickness and percentage of inhibition were calculated. The findings were compared statistically by ANOVA test followed by TUKEY.

Paw Volume

On 17^{th} Day the increase in paw volume was found to be 0.55±0.05ml in the Control Group while it was significantly reduced to 0.21±0.05ml ($P<0.01$) with standard (Diclofenac sodium). Increase in paw volume was also significantly reduced in the group treated with Aq. Susp. of tablet with 200 mg/kg, 300 mg/kg and 400mg/kg and it was found to be 0.29±0.07ml ($P<0.01$), 0.25±0.06ml ($P<0.01$) and 0.20±0.05ml ($P<0.01$) respectively. The percentage of inhibition of increase in paw volume was found to be 61.82% with standard drug; whereas in the test drug treated groups 47.28%, 54.55% and 63.64% of Aq. Susp. of compound formulation, respectively. The results are presented in Table 1 and Fig. 1.

Ankle Thickness

On Day 17, the increase in ankle thickness was found to be 2.96±0.34mm in the Control Group while it was significantly reduced to 1.10±0.15mm ($P<0.001$) with Diclofenac sodium. Increase in ankle thickness was also significantly reduced in the group treated with Aq. Susp. of tablet with 200mg/kg, 300 mg/kg and 400

mg/kg and it was found to be 1.60±0.35mm (P<0.001), 1.32±0.27mm (P<0.001) and 1.17±0.34mm (P<0.001) respectively. The percentage of inhibition of ankle thickness was found to be 62.84% with standard drug; whereas in the test drug treated groups it was found to be 45.95%, 55.41% and 60.48% with 200mg/kg, 300 mg/kg and 400 mg/kg of Aq. Susp. of compound formulation, respectively. The results are presented in Table 1 and Fig. 3.

The secondary lesions i.e. swelling in other hind paw and fore paws, any nodules in the tail and ears were also looked for but not found in any group.

Tests for Analgesic Activity

1. Eddy's Hot Plate Test

Group I (Standard drug Diclofenac sodium 10mg/kg): The initial reaction time was found to be 4.24±0.31 sec. while it was increased to 5.22±0.31 sec. at 60 minutes, 7.39±0.31sec. (p< 0.001) at 75 minutes, 10.30±0.30 sec. (p< 0.001) at 90 minutes, 10.88±0.31 sec. (p< 0.001) at 105 minutes, 15.05±0.31 sec. (p< 0.001) at 120 minutes and 13.51±0.36 sec. (p< 0.001) at 135 minutes.

Group II (Aq. Susp. of tablet 200mg/kg): The initial reaction time was found to be 6.47±0.54 sec. while it was increased to 6.94±0.54 sec. at 60 minutes, 7.21±0.53 sec. at 75 minutes, 7.44±0.55sec. at 90 minutes, 7.92±0.59 sec. at 105 minutes, 10.08±0.50 sec. (p < 0.001) at 120 minutes and 12.08±0.63sec. (p< 0.001) at 135 minutes.

Group III (Aq. Susp. of tablet 300mg/kg): The initial reaction time was found to be 7.90±0.53 sec. while it was increased to 8.19±0.55 sec. at 60 minutes, 8.52±0.58 sec. at 75 minutes, 8.99±0.60 sec. at 90 minutes, 11.16±0.44 sec. (p< 0.001) at 105 minutes, 14.00±0.49sec. (p< 0.001) at 120 minutes and 16.08±0.49 sec. (p< 0.001) at 135 minutes.

Group IV (Aq. Susp. of tablet 400mg/kg): The initial reaction time was found to be 6.20±0.79 sec. while it was increased to 6.86±0.78 sec. at 60 minutes, 7.30±0.78 sec. at 75 minutes, 9.76±0.84 sec. (p< 0.05) at 90 minutes 11.85±0.87 sec. (p< 0.001) at 105 minutes, 14.01±0.93sec. (p<0.001) at 120 minutes and 13.18±0.77 sec. (p< 0.001) at 135 minutes.

The increase in reaction time in all the groups was higher at 120 / 135 minutes. All the groups showed significantly higher reaction time at 120 / 135 minutes. The maximum tolerance of pain was found with higher dose of test drug which is nearly equal to the effect of Diclofenac. The results are presented in Table 2 and Fig. 5.

Analgesiometer Test

Group I (Aq. Susp. of tablet 200mg/kg): The initial reaction time was found to be 4.23±0.19 sec. while it was increased to 4.63±0.18 sec. at 60 minutes, 5.32±0.18 sec. ($p < 0.01$) at 75 minutes, 5.18±0.18sec. ($p < 0.01$) at 90 minutes, 4.68±0.15 sec. at 105 minutes and 4.58±0.14 sec. at 120 minutes.

Group II (Aq. Susp. of tablet 300mg/kg): The initial reaction time was found to be 3.85±0.25 sec. while it was increased to 4.47±0.25 sec. at 60 minutes, 5.67±0.25 sec. ($p < 0.001$) at 75 minutes, 5.27±0.26 sec. ($p< 0.01$) at 90 minutes, 4.88±0.27 sec. ($p< 0.05$) at 105 minutes and 4.40±0.30sec. at 120 minutes.

Group III (Aq. Susp. of tablet400 mg/kg): The initial reaction time was found to be 4.07±0.23 sec. while it was increased to 5.38±0.27 sec. ($p< 0.01$) at 60 minutes, 6.05±0.29 sec. ($p < 0.001$) at 75 minutes, 5.58±0.26 sec. ($p< 0.01$) at 90 minutes 5.28±0.27 sec. ($p< 0.01$) at 105 minutes and 4.85±0.26sec. at 120 minutes.

The increase in reaction time in all the groups was higher at 75 minutes. The maximum tolerance of pain was observed with higher dose(400 mg/kg) of test formulation. The results are presented in Table 3 and Fig. 6.

Table 1: Effect of *Qurs-e-Mafasil Jadeed* in Freund's Adjuvant Induced Arthritis Test (Established Type) (Paw Volume and Ankle Thickness)

Group(s)	On day 17th after inducing Freund's adjuvant administration			
	Increase in Paw Volume in ml (Mean ± SE)	Percentage of inhibition	Increase in Ankle Thickness in mm (Mean ± SE)	Percentage of inhibition
Adjuvant	0.55±0.05	___	2.96±0.34	___
Diclofenac sodium (10mg/kg)	0.21±0.05 X^1	61.82	1.10±0.15 X^2	62.84
Aq. Susp. (200mg/Kg)	0.29±0.07 X^1	47.28	1.60±0.35 X^2	45.95
Aq. Susp. (300mg/Kg)	0.25±0.06 X^1	54.55	1.32±0.27 X^2	55.41
Aq. Susp. (400mg/Kg)	0.20±0.05 X^1	63.64	1.17±0.34 X^2	60.48
F-value	6.45		6.61	

n=6

X = Against Adjuvant 1 = $p < 0.01$

2 = < 0.001

Table 2: Effect of *Qurs-e-Mafasil* Jadeed in Eddy's Hot Plate Test

Group(s)	Reaction time in Seconds (Mean ± SE)						
	Initial	After Drug Administration					
		60 min	75 min	90 min	105 min	120 min	135min
Diclofenac sodium (10mg/kg)	4.24± 0.31	5.22± 0.31	7.39± 0.31 X^1	10.30± 0.30 X^1	10.88± 0.31 X^1	15.05± 0.31 X^1	13.51± 0.36 X^1
Aq. Susp. (200mg/Kg)	6.47± 0.54	6.94± 0.54	7.21± 0.53	7.44± 0.55	7.92± 0.59	10.08± 0.50 X^1	12.08± 0.63 X^1
Aq. Susp. (300mg/Kg)	7.90± 0.53	8.19± 0.55	8.52± 0.58	8.99± 0.60	11.16± 0.44 X^1	14.00± 0.49 X^1	16.08± 0.49 X^1
Aq. Susp. (400mg/Kg)	6.20± 0.79	6.86± 0.78	7.30± 0.78	9.76± 0.84 X^2	11.85± 0.87 X^1	14.01± 0.93 X^1	13.18± 0.77 X^1

n=6

X = Against Initial Reaction Time 1 = p <0.001 2 = p < 0.05

Table 3: Effect of *Qurs-e-Mafasil Jadeed* in Analgesiometer Test

Group(s)	Reaction Time in seconds (Mean±SE)							
	Initial	After Drug Administration						
		15 min	30 min	45 min	60 min	75 min	90 min	105 min	120 min
Aq. Susp. 200mg/Kg)	4.23± 0.19	4.28± 0.19	4.37± 0.19	4.40± 0.20	4.63± 0.18	5.32± 0.18 X^2	5.18± 0.18 X^2	4.68± 0.15	4.58± 0.14
Aq. Susp. (300mg/Kg)	3.85± 0.25	3.95± 0.24	4.18± 0.26	4.42± 0.27	4.47± 0.25	5.67± 0.25 X^1	5.27± 0.26 X^2	4.88± 0.27 X^3	4.40± 0.30
Aq. Susp. (400mg/Kg)	4.07± 0.23	4.15± 0.26	4.52± 0.29	4.68± 0.27	5.38± 0.27 X^2	6.05± 0.29 X^1	5.58± 0.26 X^2	5.28± 0.27 X^2	4.85± 0.26

n=6

X = Against Initial Reaction Time 1 = p < 0.001 2 = p < 0.01 3=p<0.05

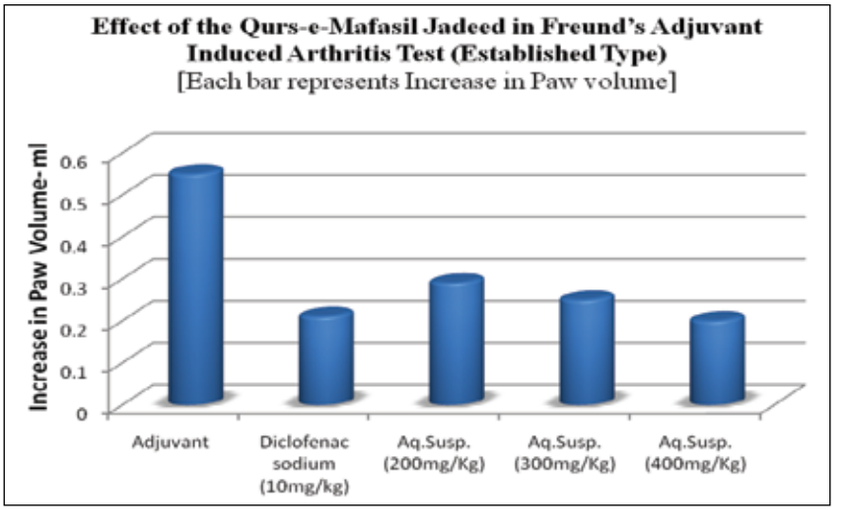

Fig.1

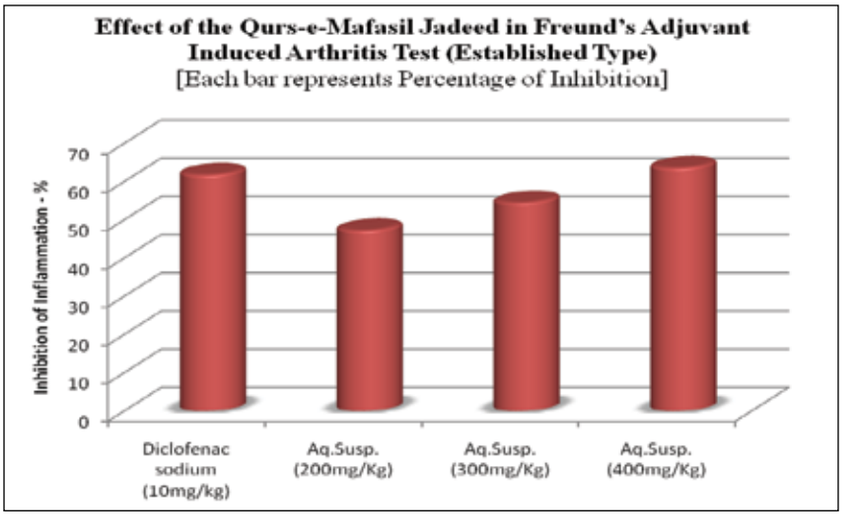

Fig.2

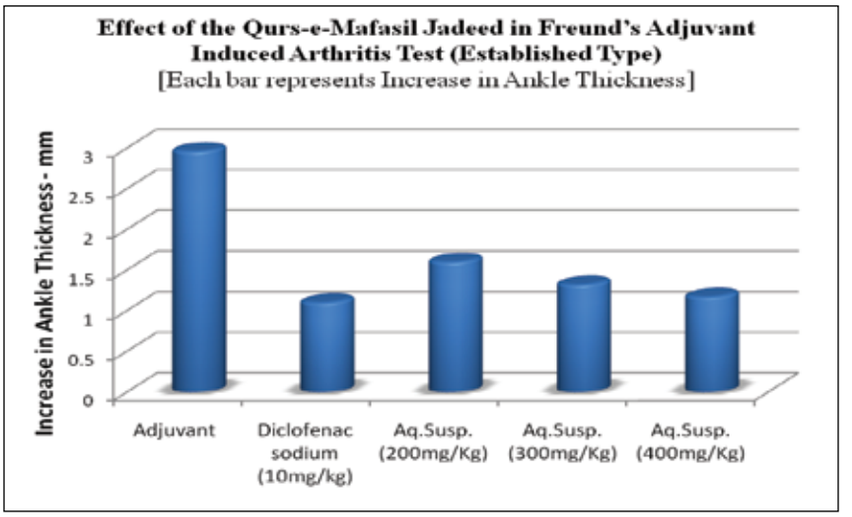

Fig.3

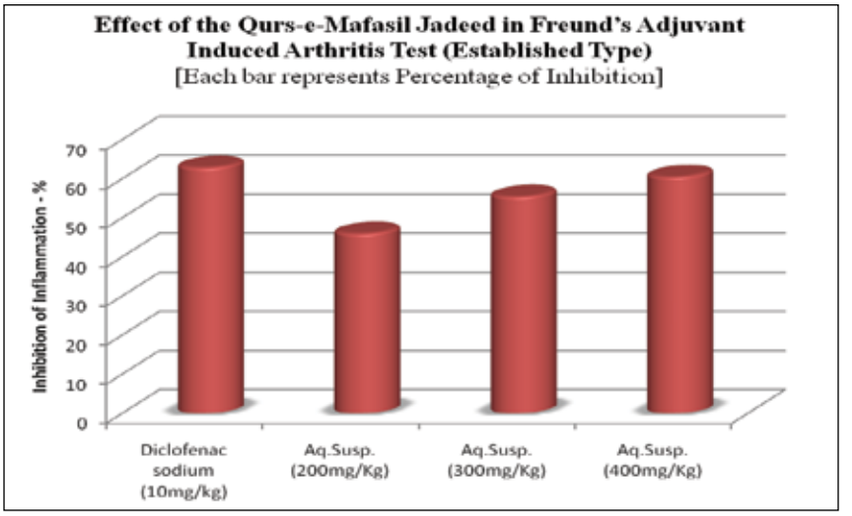

Fig.4

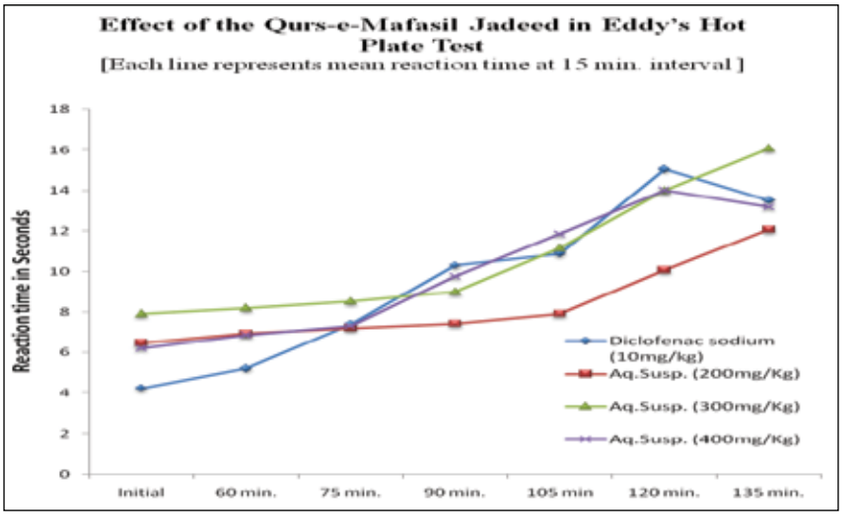

Fig.5

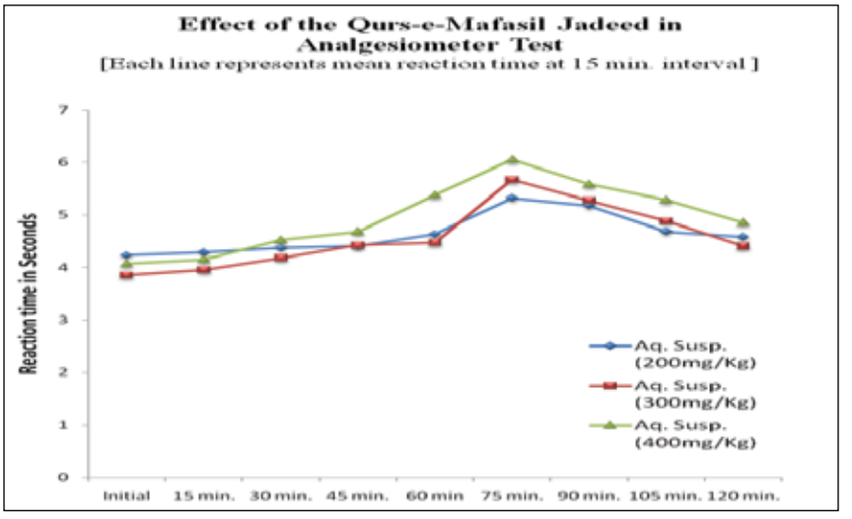

Fig.6

Discussion

In Freund's Adjuvant Arthritis Test Established Type the standard drug Diclofenac sodium, lower, medium and higher doses of Aq. susp. of the test formulation were found to decrease the hind paw volume and ankle joint thickness significantly ($p<0.01$) as compared the control group. Therefore, the study shows that all the three doses of aq. susp. of the test formulation possess significant anti-arthritic activity. However, there was no significant difference between the effects of the three doses of aq. susp. The percentage inhibition of arthritis in left hind paw of albino rats on 17^{th} day was found to be 61.82% with standard drug; 47.28%, 54.55% and 63.64% with the 200 mg/kg, 300 mg/kg and 400 mg/kg of the aq. susp. of tablet, respectively.

Furthermore, even if the paw-volume is more commonly used as the marker for assessing anti-arthritic activity but some studies employ ankle-joint thickness also as marker. Therefore, the ankle thickness was also observed for its anti-inflammatory activity. The percentage inhibition of ankle thickness in left hind paw of albino rats was found to be 62.84% with standard drug; 45.95%, 55.41% and 60.48% with 200 mg/kg, 300 mg/kg and 400 mg/kg of aq. susp. of tablet, respectively.

Therefore, in the present study both markers viz; paw volume and ankle thickness were studied. The study showed both parameters vary in the same manner in control and test drug groups. Thus, the present study shows that both paw-volume and ankle-joint thickness are valid markers for Freund's Adjuvant Arthritis Test. And all the three doses of the aqueous suspension of the tablet possess significant activity against arthritis. The results clearly indicate that the test drugs possess a striking and good protective activity against established arthritis which is in close proximity to the effect of Diclofenac sodium.

Since most of the anti-inflammatory drugs possess analgesic activity, the test drug was also studied for its possible analgesic effect by Eddy's Hot plate Test and Analgesiometer Test. These tests were selected because of several advantages including the sensitivity to strong analgesics and limited tissue damage (Shahabadkar et al., 2010).

In Eddy's Hot plate Test the reaction time was noted before and after 60 minutes of the treatment, at every 15 minutes intervals for 75 minutes. All the groups treated with the test drug or standard drug showed higher increase in the reaction time at 120 min /135 min. The level of significance was: $p<0.001$ with standard drug and higher dose, medium dose and lower dose of Aq. susp. of tablet.

The onset, peak and duration of analgesia with the higher dose and standard drug were 90 min., 120 min., 135 min. and 75 min., 120min and 135 min. respectively. The onset and peak of analgesia with medium dose and lower dose were 105 min., 135 min. and 120 min., 135 min. respectively.

In the Analgesiometer Test the post treatment reaction time of the groups (2nd and 3rd) treated with medium and higher dose of the test drug were found to be significantly higher at 75 min. ($p<0.001$) and group 1st treated with lower dose of the test formulation was found to be significantly higher at 75 min ($p<0.01$) against initial reaction time. The result shows that all the doses of the test formulation possess analgesic effect. The onset, peak and duration of analgesia with higher dose of the Aq. susp. of test formulation was 60 min., 75 min. and 105 min. respectively. The peak and duration of analgesia with the lower and medium dose of aq. susp. of tablet were found to be 75 min., 90 min. and 75 min, 105 min. respectively. Here maximum tolerance of pain was observed in higher dose of test formulation.

Considering the results of the test for anti-arthritic activity (Freund's Adjuvant Arthritis Test) and test for analgesic activity (Eddy's hot-plate test and Analgesiometer test), it may be inferred that tablet is effective in painful chronic arthritis. Thus, it can be concluded that the test drug possesses a significant anti-arthritic and analgesic effect. These findings are in conformity with anti-arthritic and analgesic effect of the tablet containing Suranjan and Haldi.

Conclusion

- The tablet / compound formulation possesses significant anti-arthritic and analgesic activity.
- The higher dose of aq. susp. of the formulation possesses remarkable anti-arthritic and analgesic activity approximately equal to the effect of standard referent agent (Diclofenac sodium).
- The aqueous suspension of the tablet possesses analgesia, probably of the Opioid type.
- The study scientifically validates the clinical use of the Unani Formulation in arthritic conditions.
- The study indicates that there is an ample scope for clinical studies of the Unani Formulation for its effect on Rheumatoid Arthritis with long term morbidity and mortality.
- The Formulation may be studied for possible synergistic interactions or / and chemical changes occurring due to ingredient interaction and the compounding process.
- The study offers an improvement in Unani Healthcare by showing more convenient Tablet form which is effective in arthritis.
- The parameters applied for standardization of lab samples of the Tablet (Compound Formulation) may be taken as standard parameters for future reference.

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सारांश

यूनानी मिश्रण कुर्स-ए-मफ़ासिल जदीद का गठियारोधी और पीड़ानाशक प्रभाव का मूल्याकंन : एक पूर्व-नैदानिक अध्ययन

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यह अध्ययन कुर्स–ए–मफ़ासिल जदीद, जिसमें कोल्चिकम ल्यूटियम, करक्यूमा लोगां और अकेशिया अरेबिका का गोंद शामिल है, के गठियारोधी और पीड़ानाशक गतिविधि का पता लगाने के लिए किया गया। इस अध्ययन में अकेशिया के गोंद में कुर्स/टैबलेट पाउडर के 2% जलीय सस्पेन्शन का उपयोग फ्रुंड सहायक गठिया परीक्षण, ऐड्डी हॉट प्लेट परीक्षण और ऐनाल्जीसीओमीटर परीक्षण द्वारा गठियारोधी और पीड़ानाशक गतिविधि को निर्धारित करने के लिए किया गया। इस यूनानी मिश्रण की प्रभावकारिता की तुलना, मानक औषधि, डिक्लोफेनेक सोडियम के साथ की गई। इस अध्ययन में खुराक़ में फ्रुंड के सहायक गठिया परीक्षण के अनुसार यह पाया गया कि नियंत्रण समूह की तुलना में परीक्षण मिश्रण का जलीय सस्पेन्शन न्यूनतम, मध्यम, उच्चतम पिछले पैर के विस्तार क्षेत्र और एंकल ज्वाइंट की मोटाई को सार्थकता से कम करता है ($P<0.01$)। इस अध्ययन से पता चलता है कि परीक्षण मिश्रण के जलीय सस्पेन्शन की सभी तीनों खुराक़ों में महत्वपूर्ण गठियारोधी गतिविधि होती है। ऐड्डी हॉट प्लेट परीक्षण और ऐनाल्जीसीओमीटर परीक्षण में, प्रक्रिया समय में एक असाधारण वृद्धि को दर्शाती है कि यौगिक मिश्रण की सभी खुराकों में एक अच्छी पीड़ानाशक गतिविधि होती है।

शब्द कुंजीः अकेशिया अरेबिका, पीड़ानाशक गतिविधि, गठियारोधी गतिविधि, कोल्चिकम ल्यूटियम, करक्यूमा लोगां, कुर्स–ए–मफ़ासिल जदीद