

CURCUMA LONGA IN CASES OF ARTHRALGIA- A RANDOMISED SINGLE BLIND CONTROLLED TRIAL

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ABSTRACT

Arthralgia, i.e. pain in joints decreases the quality of life to a great extent. It significantly affect the psychosocial status of affected people as well as their families and DALYS (Disability Adjusted Life Years). Current estimates of people affected worldwide include back pain 632 million, neck pain 332 million, osteoarthritis of the knee 251 million, and other MS conditions 561 million. The present study was conducted to evaluate the analgesic property of *Curcuma longa* in cases suffering from arthralgia. The cases were assessed on VAS scoring. Dependent sample (paired) t-test result, to assess the effect of *Curcuma longa* on VAS score post treatment (M= 3.72, SD= 2.31), compared to pre treatment (M= 7.33, SD= 1.69), indicates decrease in VAS score after treatment with *Curcuma longa*. Levene's test indicated equal variances (F= 10.19, p= 0.002) so df= 94. There is significant (p= 0.00) decrease in VAS score with *Curcuma longa* (M=3.72, SD= 2.31) than Placebo

(M= 7.00, SD= 1.53), t(94)= 8.18, the mean difference between the groups being M= 3.29, SE= 0.40. Thus stating that *Curcuma longa* has a role in decreasing the VAS score after treatment with mean difference of M= 3.29, SE= 0.40 as compared to Placebo in patients suffering from arthralgia. The symptoms in which *Curcuma longa* showed maximum improvement were aggravated by motion, cloudy weather, morning and ameliorated by rest and warmth. 30th centesimal potency of *Curcuma longa* showed maximum results in arthralgia.

KEYWORDS: *Curcuma longa*.

INTRODUCTION

Arthralgia means pain in joints. It can be due to involvement of articular structures (synovium, synovial fluid, articular cartilage, intra articular ligaments, joint capsule & juxta articular bone) or non-articular structures (extra articular ligaments, tendons, bursae, muscle, fascia, bone, nerve and overlying skin).^[1] It is a symptom present in many diseases such as gout, rheumatoid arthritis, osteoarthritis, SLE, etc. Arthralgia decreases the quality of life to a great extent. It significantly affect the psychosocial status of affected people as well as their families and DALYS (Disability Adjusted Life Years). Discomfort of musculoskeletal (MS) conditions, causing arthralgia, affect more than 1.7 billion people worldwide and have the fourth greatest impact on the overall health of the world population, considering both death and disability. This burden has increased by 45% during the past 20 years globally. Current estimates of people affected worldwide include back pain 632 million, neck pain 332 million, osteoarthritis of the knee 251 million, and other MS conditions 561 million.^[2] Musculoskeletal conditions which cause arthralgia, encompass a spectrum of conditions, from those of acute onset and short duration to lifelong disorders, including osteoarthritis, rheumatoid arthritis, osteoporosis, and low back pain.^[3]

The global prevalence of different musculo skeletal disorders causing arthralgia are- RA - 0.24%,^[4] Low Back Pain(LBP)- 9.4%^[5],Gout- 0.08%^[6], knee OA- 3.8 and hip OA-0.85%^[7], neck pain-4.9%.^[8]

Curcuma longa, commonly known as haldi^[9], is a small perennial plant distributed in South Asia and is cultivated extensively throughout warmer parts of the world, including India.^[10] As a medicine it is used to treat a wide variety of ailments including stomach pain, skin problems, muscular problems and arthritis. It has many rhizomes on its root system which are the source of its culinary spice known as Turmeric and its medicinal extract called Curcumin.^[9] Rhizome is used for medicinal preparation. The medicine was introduced in Homoeopathy and proved by Arya, Balachandran and Augustine.^[11]

Global domestic application of *Curcuma longa* in relieving pain exerts the necessity of verifying the symptoms homoeopathically so that the ailing population can be given good aid. Previous conducted researches have thrown some light on analgesic effects of *Curcuma longa*. Drug proving^[12] and clinical verification^[13] studies of *Curcuma longa* by CCRH shows

its effect in lumbago and shoulder pain. One of CCRH studies shows peripheral analgesic activities of *Curcuma longa* (Mother tincture) in hot plate induced thermal algnesia in mice.^[14] In these studies it was advised to re-verify the symptoms and to identify the analgesic effect on human subjects.

So based on the previous research work, further exploration on the therapeutic analgesic effect of *Curcuma longa* in cases of arthralgia was required. Henceforth, the proposed study was conducted at Dr. M.P.K. homoeopathic medical college, hospital and research centre Jaipur, and special emphasis was laid down in the methodology so that more reliable characteristics in terms of joint affinity, modalities, side, sensation of *Curcuma longa* can be recognized.

METHODS

Study setting

The study was conducted at Dr. M.P.K. Homoeopathic Medical College Hospital and Research centre, Jaipur, Sindhi camp and saipura campus. The cases were selected from OPD/IPD for a period of 9 months and each case was followed up for atleast 6 follow-ups.

Sample selection

The sample size for the study was 100 cases at power $(1-\beta)=0.70$, $\alpha=0.05$ and treatment effect $d=0.05$ (50%). So, the sample size for each group was 50 cases.^[15]

Inclusion criteria

Cases with Arthralgia, were included in the study irrespective of their sex, caste, religion & duration of illness.

Exclusion criteria

(1) Cases which needed immediate hospitalization based on clinical dissection of the physician. (2) The cases which required emergency treatment. (3) Females who wanted to concieve, were pregnant or lactating. (4) Cases with any other severe systemic disorder. (5) Patient pursuing other treatment and were not willing to leave it.

Wash-out Period

Patients who were taking medicines previously were kept without medication for some time (depending upon the half life of the medication they were taking).

Randomisation, blinding and intervention

The cases were divided into two groups; one of medicine (*Curcuma longa*) and other of control (Placebo). Each group had 50 cases which were randomly assigned with the concealed allocation by lottery method. The participants were blinded to the allocation. Both, the verum and control group, got similar globules of No. 6, thrice daily orally which was dispensed by hospital dispensary by a certified pharmacist. Both the groups were advised physiotherapy prescribed by a certified physiotherapist in the hospital.

Data collection

A detailed case taking form was designed and approved for the study in which the case history of the patients were documented and were kept confidential. These records were used for follow-ups and analysis of the case.

Each case had a parameter scale- VAS; which is a pain assessment tool to assess pain accordingly to individual patient. VAS scale is a straight horizontal line 100mm in length anchored with word descriptors at each end. The patient marks on the line the point he/she feel represents his/her current state of pain.^[16]

Statistical analysis

The VAS score of each patient before the commencement of the treatment and after 6 follow-ups were assessed by the formula-

$$\frac{\text{Baseline Score} - \text{After Score}}{\text{Baseline Score}} \times 100\%$$

The percentage was then allotted in one of the following criteria for improvement-

Marked Improvement= 75%-100%

Moderate Improvement= 50%-74%

Mild Improvement= 25%-49%

Non significant= <25%

Status Quo= 0%

SPSS software was used to analyze the study. Paired t-test was used to assess before and after scores in a group. Independent t-test was used to compare effect between medicine and placebo. Alpha of 0.05 was used to determine statistical significance.

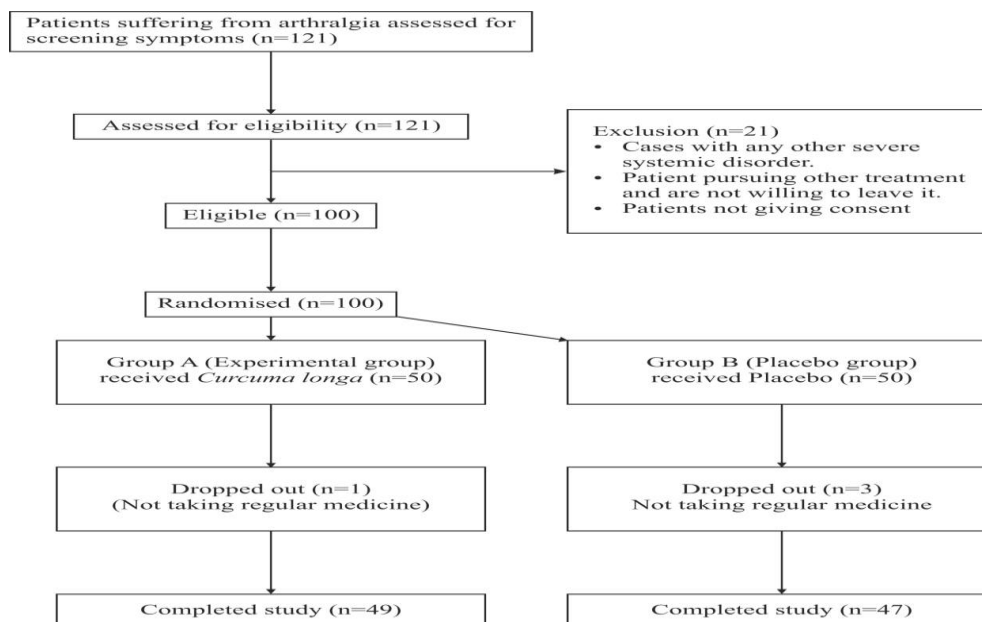


Figure 1: Flow diagram of the study.

RESULTS AND DISCUSSION

A total of 100 patients were enrolled in the study meeting the inclusion and exclusion criteria after screening 121 patients from the hospital OPDs. Of these, 4 dropped out and the data of 96 participants, 49 in group A and 47 in group B (Figure 1) were analyzed after 6 follow-ups. The baseline characteristics of the participants (Table 1) showed that both groups were comparable at the baseline. Mean age of the participants was 40.99 years. Wolff JI et.al study shows that musculoskeletal disorders are common problems affecting the elderly.^[17] With age, musculoskeletal tissues show increased bone fragility, loss of cartilage resilience, reduced ligament elasticity, loss of muscular strength, and fat redistribution decreasing the ability of the tissues to carry out their normal functions.^[18] Both groups A and B had more females suffering from arthralgia i.e. 59.18% and 68.09% respectively. The majority of the studies showed that women had significantly higher incidences of various types of UEMSDs than men.^[19] The probable reason for higher incidence among female patients may be due to their postmenopausal status and habit of constant squatting, which coincides with the findings observed by Reddy et al^[20], Patil PS et al^[21], Goldman et al^[22], Kaspar et al^[23], Russel RCG et al^[24], Spector et al.^[25]

Maximum number of patients were from rural area (81.63% in Group A and 63.83% in Group B). There is a strong evidence for an association between urbanicity and arthritis.^[27] Group A had maximum (30.62%) farmer patients while Group B had maximum (44.68%) house hold workers. Chronic musculoskeletal pain is prevalent among farm workers.^[28]

Musculoskeletal disorders of the workplace include the acute, cumulative and chronic injuries or illnesses of the soft tissues which are caused by mechanical stress, strain, sprain, vibration, inflammation, or irritation.^[29] There were more patients who were from middle socio economic status i.e. 22(44.90%) in group A and 39(82.98%) in group B. While NE et al^[30] and Salve et al^[31] stated that OA was found to be higher in low socioeconomic class as compared to middle socioeconomic status. Knee joint was maximum affected in both the groups with OA as the major disease patients suffered from as seen in studies of Shahdab M. et.al^[32], Kumar and Clarke et al^[35], Shah SN et al^[37], Goldman and Ausilo^[22], Warrel DA et al^[26] as Indians (especially women) are more prone to Knee OA due to their squatting habits in daily activities. Joints which showed much improvement in the study with *Curcuma longa* were shoulder joint, ankle joint, back, finger joints, neck, knee joint in decreasing order(Figure 3). From CCRH proving^[13], joint affected by *Curcuma longa* are lumbar region, sacral region with shifting pain in hip joints, cervical region, right supra scapular region. While in CCRH clinical verification study,^[13] back, shoulder and elbow pains were seen to be improved. Aggravation from motion, morning and amelioration by rest, warmth, hot fomentation (Figure 2) which was similar with CCRH proving^[12] results in various joints, while aggravation in cloudy weather is not mentioned there. Stiffness, pulsating pain, throbbing pain, aching and bursting pain were found in the study(Figure 4) while CCRH proving^[62] of *Curcuma longa* showed burning pain, aching pain in sacral region with shifting pain in hip joints and stiffness in cervical region.

After treatment with *Curcuma longa*, the diseases which showed improvement in pain were Frozen Shoulder, Rotator cuff tear, Gout, Sciatica, Post traumatic Arthralgia, Rheumatoid Arthritis, Post Viral Arthralgia and Osteo Arthritis. (Figure 5).

Some clinical symptoms like constipation with no urge to stool, distention of abdomen ameliorated by passing flatus, diminished appetite were seen to be improving in many patients which is seen in CCRH studies.^[12,13]

The potency of *Curcuma longa* which showed maximum improvement in arthralgia was 30 CH. *Curcuma longa* showed improvement in decreasing order in back pain followed by left sided, right sided, bilateral pains in arthralgias. CCRH clinical verification^[12] study showed its left sided joint affection more. Improvement status in both the groups is given in figure 6.

Table 1: Baseline characteristics of the participants.

S.No.	Variable	Group A (<i>Curcuma longa</i>) (n=49)	Group B (Placebo) (n=47)
1.	Age		
	less than 18 years	2(4.08%)	6(12.77%)
	18-35 years	10(20.40%)	20(42.55%)
	36- 50 years	21(42.86%)	15(31.92%)
	51-65 years	11(22.45%)	3(6.38%)
	66 years and above	5(10.21%)	3(6.38%)
2.	Sex		
	Male	20(40.82%)	15(31.92%)
	Female	29(59.18%)	32(68.09%)
3.	Habitat		
	Rural	40(81.63%)	30(63.83%)
	Urban	9(18.37%)	17(36.17%)
4.	Socio-Economic Status		
	Upper Class	0	0
	Upper Middle Class	5(10.20%)	1(2.13%)
	Middle Middle Class	22(44.90%)	39(82.98%)
	Lower Middle Class	5(10.20%)	6(12.77%)
	Lower Class	17(34.69%)	1(2.13%)
5.	Occupation		
	Sitting Job	10(20.40%)	6(12.77%)
	Household Work	12(24.49%)	21(44.68%)
	Farmer	15(30.62%)	5(10.64%)
	Labour	6(12.25%)	0
	Standing Job	3(6.12%)	4(8.51%)
	Student	3(6.12%)	11(23.40%)
6.	Affected Joint (number of patients)		
	Knees	37(75.51%)	31(65.96%)
	Shoulder	16(32.65%)	5(10.64%)
	Elbow	7(14.29%)	6(12.77%)
	Wrist	6(12.25%)	5(10.67%)
	Hips	5(10.20%)	4(8.51%)
	Ankles	12(24.49%)	15(31.92%)
	Inter pharyngeal joints	12(24.49%)	6(12.77%)
	Back	8(16.33%)	6(12.77%)
	Neck	2(4.08%)	0
7.	Affected Side (number of patients)		
	Right	8(16.33%)	17(36.17%)
	Left	5(10.20%)	4(8.51%)
	Bilateral	35(71.43%)	24(51.06%)
	Back and Neck	10(20.41%)	7(14.89%)
8.	Modalities -(number of patients)		
8.a.	Aggravation Motion	20(40.82%)	18(38.30%)
8.b.	Aggravation Cloudy/Wet weather	12(24.49%)	6(12.77%)
8.c.	Aggravation Morning	12(24.49%)	12(25.53%)
8.d.	Amelioration Hot Fomentation, Warmth	9(18.37%)	10(21.28%)
8.e.	Amelioration Rest	15(30.61%)	8(17.02%)
8.f.	Amelioration Continued Motion	13(26.53%)	8(17.02%)
8.g.	Amelioration Pressure, Rubbing, Massage.	9(18.37%)	12(25.53%)

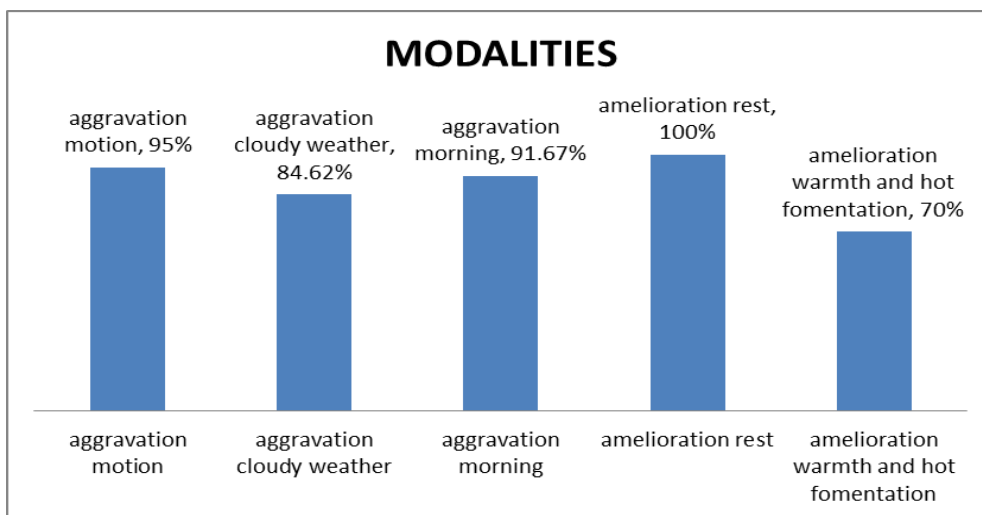


Figure 2: Modalities of arthralgia with percentage improvement with Curcuma longa.

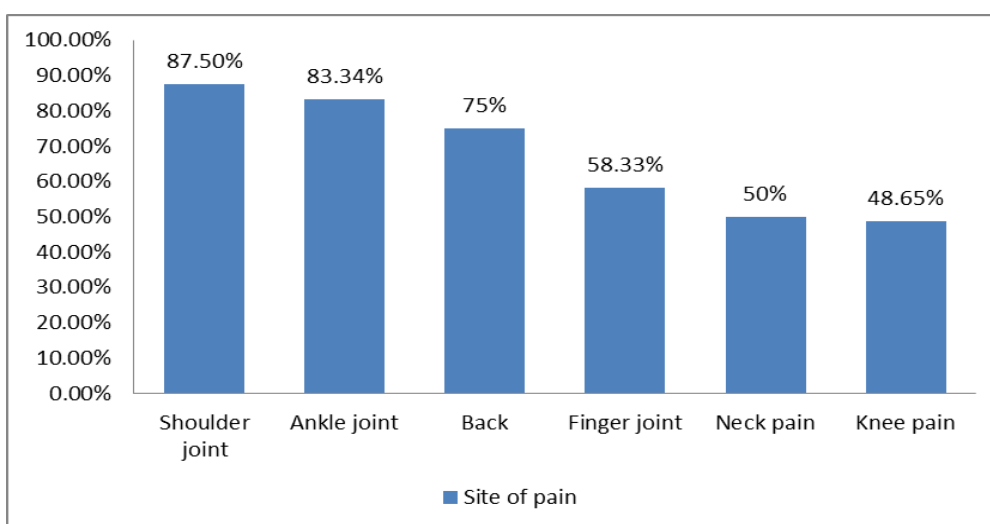


Figure 3: Percentage improvement for joint affection of Curcuma longa.

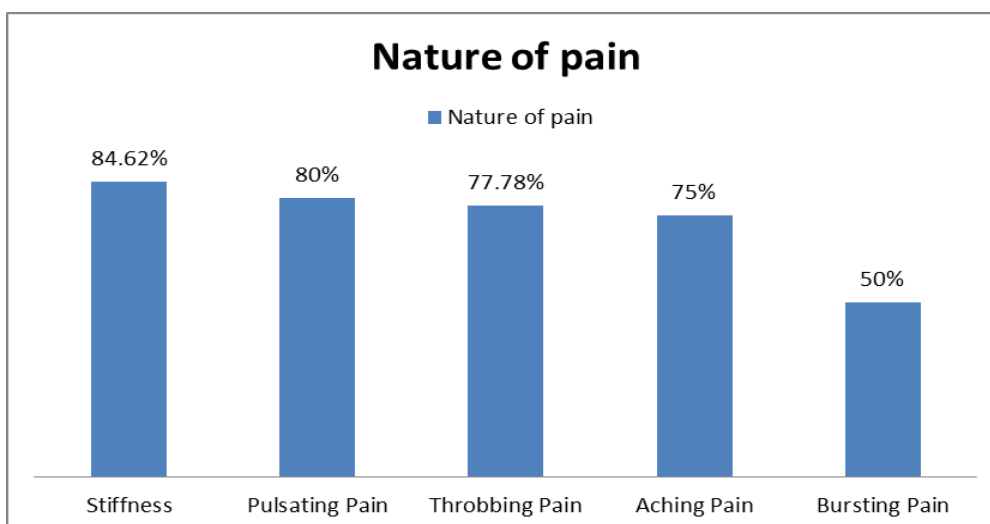


Figure 4: Percentage improvement in nature of pain.

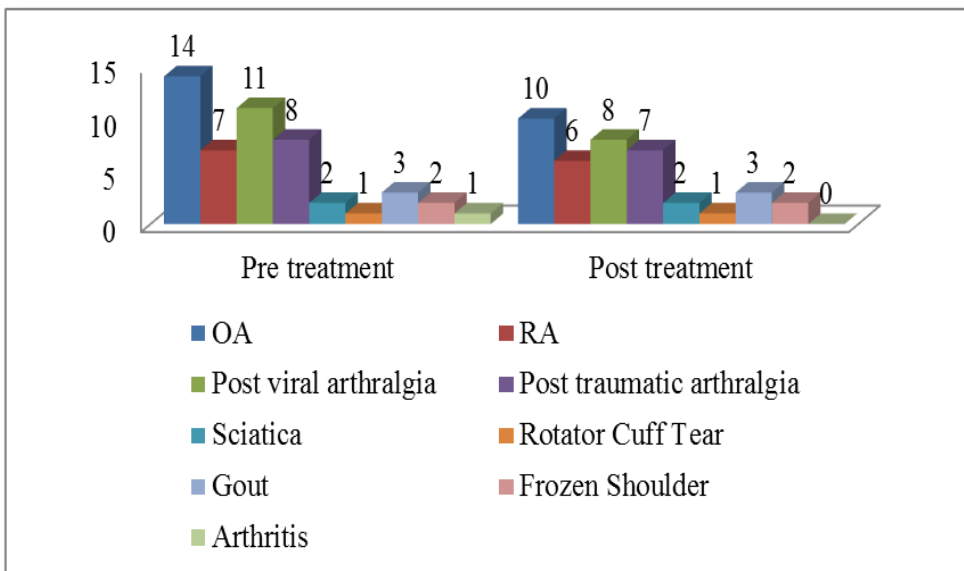


Figure 5: Diseases causing arthralgia and their improvement in patients administered with Curcuma longa.

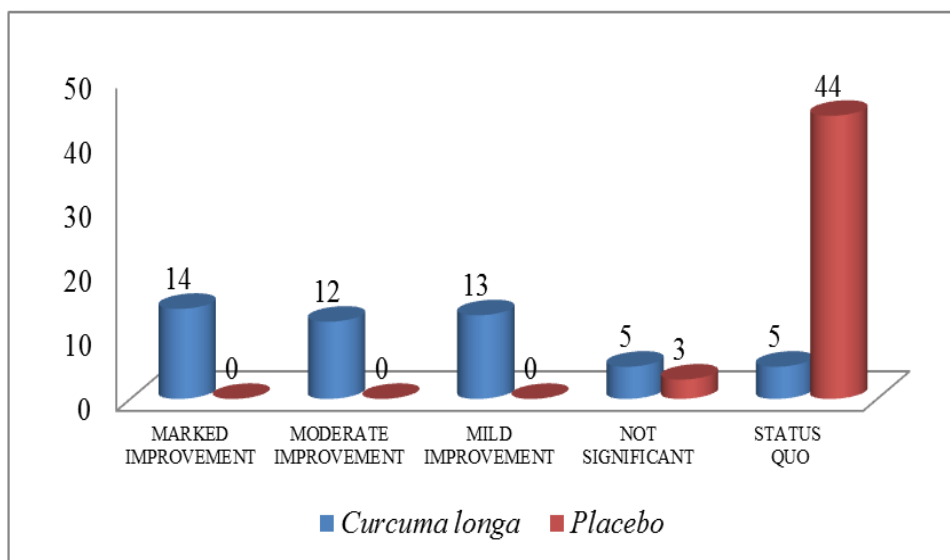


Figure 6: Graphical representation to show improvement of Curcuma longa vs Placebo in cases of Arthralgia.

Following hypothesis were tested for the assessment of the effect of *Curcuma longa* on VAS score in patients suffering from Arthralgia:

NULL HYPOTHESIS (H_0) – *Curcuma longa* has no role in reducing pain in the cases of arthralgia.

ALTERNATE HYPOTHESIS (H_1) – *Curcuma longa* has a role in reducing pain in the cases of arthralgia as compared to Placebo.

Statistical Analysis

Dependent sample (paired) t-test result, to assess the effect of *Curcuma longa* on VAS score post treatment (M= 3.72, SD= 2.31), compared to pre treatment (M= 7.33, SD= 1.69), indicates decrease in VAS score after treatment with *Curcuma longa*, difference of mean= 3.61, $t(49)= 10.83$, $p<0.001$.(Table 2,3).

Paired sample test results indicate that Placebo didn't produce significant change in VAS score when mean (M= 7.00, SD= 0.23) post treatment was compared with mean (M= 7.09, SD= 1.53) pre treatment at $t(47)= 1.66$, $p=0.103$.(Table 4,5).

Levene's test indicated equal variances ($F= 10.19$, $p= 0.002$) so $df= 94$. There is significant ($p= 0.00$) decrease in VAS score with *Curcuma longa* (M=3.72, SD= 2.31) than Placebo (M= 7.00, SD= 1.53), $t(94)= 8.18$, the mean difference between the groups being M= 3.29, SE= 0.40.(Table 6,7).

Therefore, Null Hypothesis gets rejected stating that *Curcuma longa* had a role in decreasing the VAS score after treatment with mean difference of M= 3.29, SE= 0.40 as compared to Placebo in patients suffering from arthralgia. Results show that *Curcuma longa* has an effect in reducing pain of patients suffering from arthralgia which correlates with the finding of CCRH.^[14]

Table 2: Paired Samples Statistics of VAS score of Group A- *Curcuma longa*.

		Mean	N	Std. Deviation	Std. Error Mean
Group A	Before	7.3265	49	1.68804	.24115
	After	3.7143	49	2.30940	.32991

Table 3: Paired Samples Test of VAS score of Group A- *Curcuma longa*.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Group A	Before- After	3.61224	2.33467	.33352	2.94165	4.28284	10.831	48	.000

Table 4: Paired Samples Statistics of VAS score of Group B- Placebo.

		Mean	N	Std. Deviation	Std. Error Mean
Group B	Before	7.0851	47	1.55801	.22726
	After	7.0000	47	1.53226	.22350

Table 5: Paired Samples Test of VAS score of Group B- Placebo.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Group B	Before- After	.08511	.35076	.05116	-.01788	.18809	1.663	46	.103

Table 6: Group Statistics in VAS score in between groups.

	VAR00001	N	Mean	Std. Deviation	Std. Error Mean
VAR00002	Placebo	47	7.0000	1.53226	.22350
	<i>Curcuma longa</i>	49	3.7143	2.30940	.32991

Table 7: Independent Samples Test in VAS score.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Gp.	Equal variances assumed	10.188	.002	8.178	94	.000	3.28571	.40177	2.48799	4.08343
	Equal variances not assumed			8.245	83.760	.000	3.28571	.39849	2.49323	4.07820

CONCLUSION

From the study it can be concluded that *Curcuma longa* in potency has a significant role in reducing VAS score in patients suffering from arthralgia. *Curcuma longa* in 30th centesimal potency shows improvement in patients suffering from arthralgia in frozen shoulder, rotator cuff tear, gout, sciatica, post traumatic arthralgia, rheumatoid arthritis, post viral arthralgia and osteo arthritis with shoulder, ankle and back pain aggravated by motion, cloudy weather, morning and ameliorated by rest and warmth.

Apart from the arthralgia symptoms, *Curcuma longa* can be given to the patients suffering from constipation with no urge to stool, distended abdomen better by passing flatus and diminished appetite. The above symptoms if correspond with the symptoms of patient's symptom, *Curcuma longa* can be of great help in cases suffering from arthralgia.

The study was done on a small sample size, so, further studies on large samples is recommended with a large period of intervention of the medicine.

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