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Research Article

A COMPARATIVE STUDY TO EVALUATE ANTI-INFLAMMATORY EFFECT OF *COMMIPHORA WIGHTII* AND *BOSWELLIA SERRATA* INDIVIDUALLY, ALONG WITH *CURCUMA LONGA* AGAINST DICLOFENAC POTASSIUM [NSAID'S] ON NON-SPECIFIC KNEE EFFUSION

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ABSTRACT

Introduction: Non-Specific knee effusion is a disease secondary to degenerative changes/excessive body weight/excessive wear tear/trivial or evident trauma to the knee joint or condition associated Non-specific arthropathies. The condition can be defined as the abnormal accumulation of the fluid in the knee capsule or the adjoining supra-patellar bursa secondary to the irritation/inflammation of sub-acute strength in the joint synovium. *kroṣṭukaśīrṣa*. as described in ayurveda, can be correlated with knee effusion. Present clinical trial an effort has been made to evaluate anti-inflammatory effect of *Commiphora-wightii* and *Boswellia serrata* individually in combination with *Curcuma longa* against Diclofenac potassium [NSAID's] on Non-specific knee effusion.

Methodology: Thirty seven registered, clinically diagnosed patients of Non-specific knee effusion were selected for the present clinical trial 7 patients failed to complete the study due to non-compliance of the protocol, remaining 30 patients were assorted in to three groups. For this purpose patients were alienated into three groups- A, B & C **Group A (Trial Group I)** -Ten patients were given crude extract of *Commiphora wightii* 500 mg and *Curcuma longa* 500 mg in a separate capsules twice a day continuously for 8 weeks orally. **Group B (Trial Group II)** - Ten patients were given crude extract of *Boswellia serrata* 500 mg along with *Curcuma longa* 500 mg in a separate capsules twice a daily continuously 8 weeks orally. **Group C (Control Group)** - Ten patients were given Diclofenac Potassium 50 mg twice a day continuously for 2 weeks orally.

The patients of Group C (Control Group) were given the drug Diclofenac potassium only for two weeks in comparison to the drug intervention of eight weeks in trial groups owing to its reported gastric irritation/inflammation.

Results: The results were assessed in terms of clinical parameters on first 30 patients who complete the study. 28 patients completely recovered from their main symptoms. 2 patients also improved.

Result of Diclofenac potassium was significantly better in the outcomes in comparison to the trial drugs *Shallaki*, *Guggulu* and *Haridra* when compared at the end of two weeks of start of the trial. Trial drugs *Shallaki*, *Guggulu* & *Haridra* are also having outcomes of comparative extent to Diclofenac Potassium, When administered continuously for further 6 weeks i.e total 8 weeks.

Keywords: *Commiphora-wightii*, *Boswellia serrata*, *Curcuma longa*, Diclofenac Potassium, knee effusion.

INTRODUCTION

1. Man of this era has changed his life style to a considerable extent, due to which *Doshik* constituent of the body has altered resulting in to development of various life style disorders. Amongst these knee effusion in particular the Non-Specific knee effusion is a disease secondary to degenerative changes/excessive body

weight/excessive wear tear /trivial or evident trauma to the knee joint or condition associated non-specific arthropathies .

2. The condition can be defined as the abnormal accumulation of the fluid in the knee capsule or the adjoining supra-patellar bursa secondary to the irritation/inflammation of sub-acute strength in the joint synovium.

3. In this study an attempt has been made to study the entity Non-specific knee effusion in concern to the similar entity Kroštukaśīrṣa as mentioned in Āyurveda. In Āyurveda various drugs has wide acceptance as alternatives of NSAIDs. *Shallaki*, *Guggulu*, *Haridra* are commonly known potent anti-inflammatory drugs, in practice since ancient periods. The scientific validation of such drugs is essential for their universal acceptance. In this study an attempt has also been made to formulate a drug and its regimen for the conservative management of Non-specific knee effusion.
4. Thus, keeping in view above discussed facts; the present work entitled A comparative study to evaluate anti-inflammatory effect of *Commiphora wightii* and *Boswellia serrata* individually along with *Curcuma longa* against diclofenac potassium [NSAID'S] on Non-specific knee effusion, was carried out on the 30 patients under the Dept. Of Shalya Tantra, N.I.A, Jaipur.

Aims and objective:

Primary Aims:

To assess the therapeutic efficacy of crude extract of *Commiphora wightii* along with *Curcuma longa* on Non-specific knee effusion.

To assess the therapeutic efficacy of crude extract of *Boswellia serrata* along with *Curcuma longa* on Non-specific knee effusion.

To compare the therapeutic efficacy of above mentioned formulations with that of Diclofenac Potassium (NSAID'S) given orally on Non-specific knee effusion.

Secondary Aim:

- To study the incidence of knee effusion among the patients having Non-specific arthritis of knees.
- To study the various aspect of Non-specific knee effusion with special reference to similar entities described in *Ayurveda* in comprehensive details.
- To make available cheap, economic and side effect free formulation/regimen for the treatment of Non-specific knee effusion.
- To obtain & analyze any information regarding the toxicity/adverse effects of crude extract of *Commiphora wightii* & *Boswellia serrata* given along with *Curcuma longa* in proposed dosages.

MATERIALS AND METHODS

Total 37 patients were registered for study. Seven patients dropped out during study due to various reasons. So all observations were made on 10 patients each in the three groups.

Duration of trial:

- 8 weeks in trial groups.
- 2 weeks in standard group.

Inclusion Criteria

- ▶ Patients in the age group 15-65 yrs. of either gender having non-specific knee effusion.
- ▶ Patient who were willing for trial and ready to give written informed consent.
- ▶ Patients were selected randomly irrespective of economical, educational and marital status.

Exclusion Criteria

- Patients suffering from Knee effusion due to specific arthritis of knee joints.
- Patient with the history of recent trauma to knees.
- Excessively tense knee effusion.
- Patient having haemarthrosis of knees.
- Patient having known hypersensitivity to diclofenac potassium.
- Patient having pre-existing asthma, urticarial or other allergic type/adverse reactions on medication with steroids or other NSAIDs.

Sample Size: 30 Subjects diagnosed for Non-specific knee effusion,

Source- Subject selected from O.P.D. / I.P.D. at P.G. Department of Shalya Tantra, N.I.A. Jaipur.

Ethical Clearance : The study is approved by institutional ethical committee of NIA

Informed Consent- The study explained clearly to the subjects & their signed, written informed consent was taken before starting the trial.

Investigations:

The following investigation will be carried out before starting the research work.

A. X-ray knee joint (AP& LAT view)

B. Hematological investigation-Hb, ESR, T LC, DLC, Sugar (F&PP)

C. Serological investigations

R.A Factor

ASLO Titer

CRP

S. Uric acid

D. Urine examination (routine nd microscopic)

E. Cytology of diagnostic aspirate.

F. ELISA for T.B (If required)

Synovial Biopsy (if required)

Drug Review

SHALLAKI *Boswellia serrata*

🌀 Properties –

Rasa –Kashaya ,Tikta ,Madhura

Guna –Lagh ,Ruksha ,

Virya –Sheeta

Vipak –Katu

🌀 Pharmacological actions – *Pittasleshmahara , Grahi*

HARIDRA : *Curcuma longa*

Ayurvedic Pharmacological Properties:

❖ *Rasa* : *Tikta, Katu*

❖ *Guna* : *Ruksha, laghu*

❖ *Virya* : *Usna*

❖ *Vipaka* : *Katu*

Doshaghната: *Haridra is Kapha –Vata samak due to Usna virya*

GUGGULU: *Commiphora wightii*

Ayurvedic Pharmacological Properties:

❖ *Rasa- Tikta, Katu*

❖ *Guna- Laghu, Ruksha, Tikshna, Vishada, Sara, Sukshma, Sugandhi (Dry Guggulu), Snigdha, Pichchhila ("Fresh Guggulu)*

❖ *Veerya- Ushna*

- ❖ *Vipaka- Katu*
- ❖ *Prabhava- Tridosahara, Rasayana*
- ❖ *Doshaghnata- Vatakaphashamaka*

OBSERVATIONS AND RESULTS

The final results for different sign /symptoms are following.
 In group A patients relief in pain was 71.85 % while in group B relief in Pain was 78.12% and in group C pain relief was 75% little more than Group A and little less than Group B, p-value 0.1727 suggest that changes are not significant.
 In patient of group A relief in Tenderness is 63.63 % while in Group B relief was 76.92% and in group C relief was 78.57% p-value 0.6959 suggest that change are not significant.
 In Group A patients relief in effusion was 75.00 % while in Group B 66.67% and in groupC was 76% ,p-value 0.3771 suggest changes are not significant.
 In case of ROM relief in Group A Patients was 37.97 % while in groupB 40.74% and in groupC relief was 38.46% , p-value 0.9952 suggest that changes are not significant.
 In case of walking distance relief in Group A was 43.33% while in group B relief was 50.00 % and in group C relief was 51.72%, p-value 0.8512 suggest the changes are not significant. So it is clear in the clinical trial that all the three groups are not significant means all the group have equal relief of sign and symptoms .

DISCUSSION

The most common signs and symptoms observed in trial subjects were pain, swelling (effusion) and tenderness. To assess the signs and symptoms, after a thorough discussion in departmental research committee ,these has been graded accordingly as per their characters. The aim of this clinical study is to assess the anti-inflammatory effect of *Commiphora*

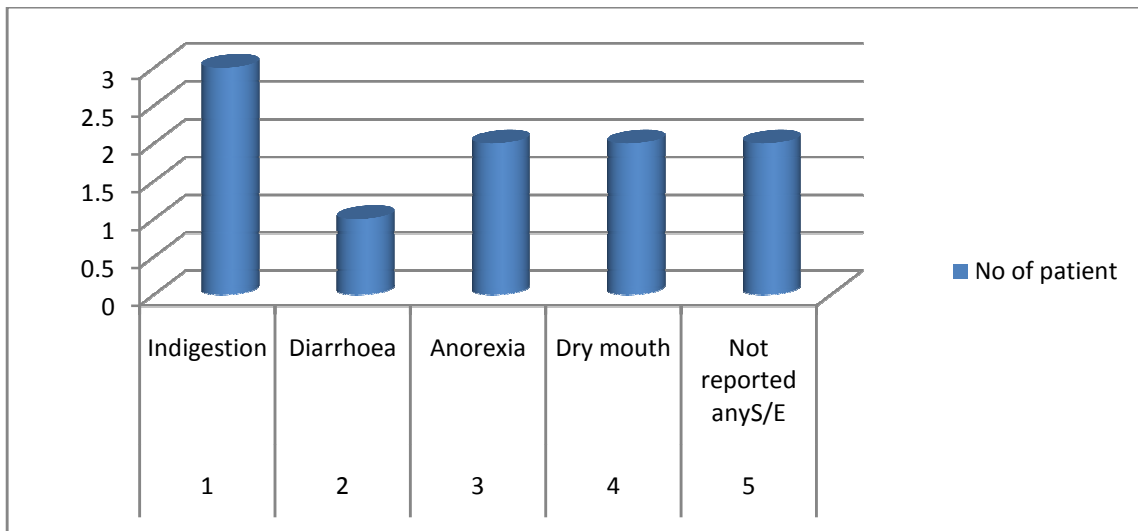
wightii and *Boswellia serrata* , along with *Curcuma longa* against Diclofenac potassium [NSAID'S] on Non-specific knee effusion, through various assessment criteria i.e. pain, tenderness, effusion, range of movements (ROM) & walking distance.

After 2 week of treatment % relief in pain in group A & B was 15.62% (p value 0.0150) and 19.44% (p value 0.0248) respectively and in group C it was 75 % (p< 0.0001).These observations show that there is a considerable difference in the relief of symptoms between Group A , Group B & Control Group C . This can be due to the proven anti-inflammatory action of the Diclofenac Pottassium In comparison to the *Shallaki, Guggulu & Haridra*

On further continuation of the intervention in trial groups for further 6 weeks i.e after 8 weeks of treatment % relief in pain in group A & B was 71.84% (p< 0.0001) and 78.12% (p< 0.0001) respectively. Hence these observations show that trial drugs *Shallaki, Guggulu & Haridra* are also having anti-inflammatory action of comparative extent with Diclofenac Potassium, When administered continuously for further 6 weeks i.e total 8 weeks.

But it has been observed that Diclofenac potassium for two weeks produces unwanted effect in most of the patient in control Group, like indigestion, diarrhoea, dry mouth, anorexia, palpitation as shown in Table & Graph below.

S.NO	Symptoms	No of patient
1	Indigestion	3
2	Diarrhoea	1
3	Anorexia	2
4	Dry mouth	2
5	Not reported anyS/E	2



After 2 weeks treatment % relief in tenderness in group A, B was 50.00% (p value) and 40.00% (p value 0.0051) respectively and in Group C was 78.57% (p< 0.00015) . This observations shows that % of relief in tenderness in Group C is comparatively much better. This again can be attributed to

the prompt relief in Group C owing to the potent anti-Inflammatory property of Diclofenac Pottassium. On further continuation of the intervention in trial groups for 6 weeks i.e after 8 weeks of treatment % relief in tenderness in group A, B was 63.63% (p value 0.0095) and 76.92% (p<

0.0001) respectively. These observations again suggest that trial drugs *Shallaki*, *Guggulu* & *Haridra* are also having anti-inflammatory action of comparative extent with Diclofenac Potassium, When administered continuously for further 6 weeks i.e total 8 weeks and the results are significantly better in the group B having intervention of *Shallaki* & *Haridra* extract.

But after statistical analysis for the results during continuous administration of Diclofenac potassium for 2 weeks when compared with 8 weeks administration of *Shallaki*, *Guggulu* & *Haridra* in the trial groups, difference in the relief of % in tenderness between Group A, Group B & Control Group C appears to be insignificant.

After 2 weeks of treatment % relief in effusion in group A, B was 25.00% (p value 0.0368) and 40.00% (p value 0.0239) respectively and in Group C it was 76.47% (p < 0.0001). This observations shows that % of relief in effusion in Group C is comparatively much better than Group A & Group B.

On further continuation of the intervention in trial groups for 6 weeks i.e after 8 weeks, after 8 weeks of treatment % relief in effusion in group A, B was 75.00% (p value 0.0002) and 66.67% (p < 0.0011) respectively. Hence these observations shows that Group A is much better than Group B having intervention of *Guggulu* & *Haridra* extract in concern to relief in symptoms.

Again after statistical analysis of the results during continuous administration of Diclofenac potassium for 2 weeks when compared with 8 weeks administration of *Shallaki*, *Guggulu* & *Haridra* in the trial groups, difference in the relief of % in effusion between Group A, Group B & Control Group C insignificant.

During assessment of range of movement after 2 week in group A & B % of relief was 27.58% (p value 0.0107) and 25% (p value 0.445) respectively and in Group C it was 38.46% (p value 0.0085). This result also shows that relief of symptoms in Group C is comparatively much better than Group A & Group B.

On further continuation of the intervention in trial groups for 6 weeks i.e after 8 weeks, in group A & B % of relief in term of the range of movements was 37.97% (p value 0.0067) and 40.74% (p value 0.0011) respectively.

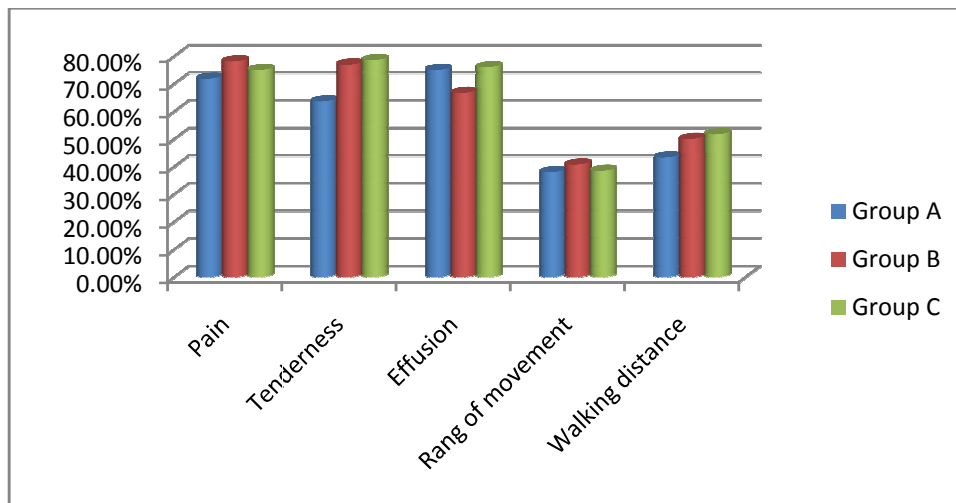
Again after statistical analysis of the results during continuous administration of Diclofenac potassium for 2 weeks when compared with 8 weeks administration of *Shallaki*, *Guggulu* & *Haridra* in the trial groups, difference in the relief of % in the range of movement in between Group A, Group B & Control Group C insignificant.

After 2 week of treatment % relief in Walking distance in group A & B was 16.66% (p value 0.0150) and 13.33% (p value 0.0368) respectively and in group C it was 51.72% (p < 0.0001). The results in Group C are significantly better in comparison to Group A and Group B. During assessment of Walking distance after 8 week in group A & B % of relief was 43.33% (p value 0.0007) and 50.00% (p value 0.0003) respectively. Results are better in Group B than Group A.

Again after statistical analysis of the results during continuous administration of Diclofenac potassium for 2 weeks when compared with 8 weeks administration of *Shallaki*, *Guggulu* & *Haridra* in the trial groups, difference in the relief of % in walking distance, between Group A, Group B & Control Group C is insignificant.

Table For The Intergroup Comparison During Overall Treatment

Sl. No.	Sign/Symptom	Group A (8 weeks)	Group B (8 weeks)	Group C (2weeks)	P-value	KW -value	Result
1	Pain	71.85 %	78.12%	75.00%	0.1727	3.513	NS
2	Tenderness	63.63%	76.92%	78.57%	0.6959	0.7250	NS
3	Effusion	75.00%	66.67%	76.00%	0.3771	1.950	NS
4	Range of movement	37.97%	40.74%	38.46%	0.9952	.009549	NS
5	Walking distance	43.33%	50.00%	51.72%	0.8515	0.3216	NS



After statistical analysis of the outcomes this can be concluded that the continuous administration of Diclofenac potassium in control group for 2 weeks when compared with 8 weeks administration of *Shallaki*, *Guggulu* & *Haridra* in the trial groups, difference in the relief of % in sign/symptoms, between Group A, Group B & Control Group C is insignificant.

Pharmacological action

Anti-inflammatory effects of *Guggulu* could be attributed to the influence i.e down-regulation of the expression of mediators of inflammation, including interleukins, transcription factors and cytokines. *Guggulsterone* demonstrated a significant effect against inflammatory mediators. *Guggulu* is able to suppress the activation of nF-kB via interfering with various activators such as hydrogen peroxide, TNF-a, phorbol ester. NF-kB, a transcription factor, is known as a significant pro-inflammatory. *Guggulsterones* also appear to reduce circulating levels of pro-inflammatory cytokines and markers such as IL-1b, IL-2, and TNF-a. *Guggulsterones* are also able to reduce Cyclo-oxygenase-2 (COX2) mRNA levels and suppress its TNFa mediated induction (activation).

Boswellic acids have been shown to inhibit 5-lipoxygenase, an enzyme that catalyzes the formation of pro-inflammatory leukotrienes from arachidonic acid. In addition to this mechanism, boswellic acids also decrease the activity of the enzyme, Human Leukocyte Elastase (HLE). This dual action is unique to boswellic acids. As leukotriene formation and HLE release are increased simultaneously in a number of inflammation and hypersensitivity-based human diseases. Curcumin also inhibits the activity and synthesis of the enzymes implicated in inflammation, such as, cyclooxygenase-2 and 5-lipoxygenase. Its anti-inflammatory action may also be attributed to inhibition of pro-inflammatory leukotrienes, prostaglandins and arachidonic acid, as well as its influence on neutrophilic activity during inflammatory states. Along with the curcuminoids, the volatile oils present in turmeric are also responsible for the anti-inflammatory activity.

CONCLUSION

Following conclusions have been drawn:

1. No clear description of Non-specific knee effusion is available as such in *Ayurvedic* literature.
2. The entity in question can be correlated with the *kroṣṭukaśirṣa*.
3. Maximum numbers of patients were of age group in between 56-65 years of age.
4. Patients with *vata-kapha* dominating *prakriti* were observed more likely to suffer from Non specific knee effusion.
5. The condition was found to be more prevalent in persons above the age of Thirty five, obese individuals or the individuals engaged in exertionous activities.
6. Swelling, Pain, Tenderness, are the definite evidence for knee effusion.
7. Pain and swelling were the two important and troublesome symptoms of knee effusion which sought an immediate clinical attention.
8. Diclofenac potassium was significantly better in the outcomes in comparison to the trial drugs *Shallaki*, *Guggulu* and *Haridra* when compared at the end of two weeks of start of the trial.
9. Trial drugs *Shallaki*, *Guggulu* & *Haridra* are also having outcomes of comparative extent to Diclofenac Potassium, When administered continuously for further 6 weeks i.e total 8 weeks.
10. After statistical analysis this was observed that continuous administration of Diclofenac potassium for 2 weeks when compared with 8 weeks administration of *Shallaki*, *Guggulu* & *Haridra* in the trial groups, difference in the % relief in between Trial Group I, Trial Group I l & Control Group C appears to be insignificant.
11. No un-wanted effect of drug in Trial Group I and Trial Group I l have been reported by the patients during the course of treatment. But in Control Group some side effect of drug noticed during the course of treatment.
12. The sample size was very small to validate the findings.
13. The study was conducted for a shorter duration i.e. for 8 weeks, followed by the follow-up of 2 months, which is not sufficient to assess the long term efficacy of the therapy.
14. To scientifically validate this fact further studies should be carried out separately with the help of more advance tools for the assessment of efficacy in Non-Specific knee effusion.

Therefore, it can be concluded that management of Non-specific knee effusion through Ayurvedic conservatives are safe and free from any side effects.

REFERENCES

1. Sushruta Samhita with 'Nibandhasamgraha' Commentary; of Sri. Dalhanacharya and 'Nyayachandrika Panjika' of Sri. Gayadasacharya on 'Nidanasthanal'. Edited by 'Vaidya Jadavji Trikmaji Acharya' and 'Narayana Rama Arya'. Choukhamba Orientalia.
2. 'Sushruta Samhita' (Text with English translation) Editor -translator-Bhshagratna Kaviraj Kunjalal. M.R.A.S. (LON), 2nd edition - 1963. Vol. - I and II.
3. Text book of Orthopedics By Natarajan M M. N. Orthopedic Hospital, 1985
4. Text book of Orthopedics By John Ebnezar First Edition -1996, Apoorva Publications, Bangalore 560076.
5. McGahan JP, Shoji H. Knee effusions. J Fam Practice 1977.
6. Graham J. Goldman JA: Fat droplets and synovial fluid leukocytosis in traumatic arthritis. Arthritis Rheum 21:76, 1978
7. Hardy RM, Wallace LH: Arthrocentesis and synovial membrane biopsy. Vet Clin North Am 4:449, 1974
8. Harris EL Jr: Role of collagenases in joint destruction. In Sokoloff L (ed): The Joints and Synovial Fluid 1. New York, Academic Press, 1978.

9. Herman HG, Moncada S: Release of prostaglandins and incapacitation after injection of endotoxin in the knee joint of the dog. Br J Pharmacol 53:465, 197
10. Reider B, Marshall JL, Koslin B, Ring B and Girgis FG, The anterior aspect of knee joint. J. Bone Joint Surg Am., 1981.
11. Sternbach GL. Evaluation of the knee. J. Emerg Med. 1986.
12. Brand C. Intra-articular and soft tissue injections. Austr Fam Physician. 1990.
13. Werner, Platzer. Color Atlas of Human Anatomy, 2004; 1.

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