The Efficacy of *Indravaruni Churna* in The Management of *Sandhivata* (Osteoarthritis): A Clinical Study

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***Abstract*—Background: *Sandhivata* (Osteoarthritis) is a prevalent degenerative joint disorder characterized by pain, stiffness, and inflammation. *Indravaruni* (*Citrullus colocynthis*) is a classical Ayurvedic herb renowned for its anti-inflammatory, analgesic, and *Vata-Kapha* pacifying properties.**

Aim: To evaluate the clinical efficacy of *Indravaruni Churna*, a compound herbal formulation, in patients diagnosed with *Sandhivata*.

Materials and Methods: A clinical study was conducted on 40 patients. Patients were administered *Indravaruni Churna*. Assessment was based on clinical parameters, biochemical markers, and radiological findings pre- and post-treatment. Statistical analysis was performed using paired t-tests and Wilcoxon signed-rank tests.

Results: The intervention resulted in statistically significant ($p<0.0001$) improvements across all clinical parameters, with pain relief of 57.96%, swelling reduction of 60.71%, and stiffness reduction of 64.13%. Biochemically, a 45.13% reduction in CRP ($p<0.0001$) was observed. Remarkably, 100% of patients seroconverted from RA Factor positive to negative. Radiological assessment showed a clear shift towards less severe Kellgren-Lawrence grades.

Conclusion: *Indravaruni Churna* demonstrated profound anti-inflammatory, analgesic, and immunomodulatory effects, providing significant clinical, biochemical, and radiological improvement in *Sandhivata*.

***Index Terms*—*Indravaruni, Citrullus colocynthis, Sandhivata,* Osteoarthritis, *Indrvaruni Churna,* Anti-inflammatory.**

I. INTRODUCTION

Sandhivata, correlated with Osteoarthritis (OA), is a chronic degenerative joint disorder and a leading cause of disability, particularly in the aging population [1]. It is characterized by the vitiation of *Vata* dosha in the joints, leading to *Shoola* (pain), *Shotha* (swelling), and *Stabdhata* (stiffness) [2]. The search for treatments that address both symptoms, and the underlying pathophysiology is crucial. *Indravaruni* (*Citrullus colocynthis*) is a pivotal herb in Ayurveda for such conditions, possessing properties (*Rasa: Tikta, Guna: Laghu, Rooksha, Teekshna, Virya: Ushna*) that are ideal for pacifying the aggravated *Vata* and *Kapha* doshas involved in *Sandhivata* [3]. This study aimed to evaluate the efficacy of a compound formulation, *Indravaruni Churna*, which leverages the action of *Indravaruni* along with other synergistic herbs.

II. MATERIALS AND METHODS

Study Design and Participants

A pre- and post-intervention clinical study was conducted on 40 patients diagnosed with *Sandhivata* based on classical Ayurvedic and modern radiological criteria. The cohort had a mean age of 57 years and was evenly split between males and females (50% each).

Intervention: *Indravaruni Churna*

The therapeutic intervention was the administration of *Indravaruni Churna*. The formulation's composition and the pharmacological rationale for its ingredients, as derived from the accompanying drug review, are detailed below:

- *Indravaruni* (*Citrullus colocynthis*) Root/Fruit:

The primary drug. Its anti-inflammatory and analgesic properties directly address joint pain and swelling [3, 4]. Its *Tikta* (bitter) *Rasa* and *Ushna* (hot) *Virya* are crucial for breaking the disease pathogenesis (*Samprapti*) by pacifying *Kapha* and *Vata* [3]. Its

hypolipidemic and hypoglycemic actions also support metabolic health, which is often compromised in chronic conditions [4].

- *Pippali* (*Piper longum*) Fruit:

Used as a *Yogavahi* (bio-enhancer) to ensure the effective delivery of the other herbal components to the target tissues [5]. Its *Katu* (pungent) *Rasa* and *Ushna Virya* contribute to its anti-inflammatory and analgesic effects. It is a premier herb for respiratory conditions but is also classically used for abdominal disorders and pain, supporting its role in a comprehensive treatment [5].

- *Guda* (Jaggery):

Served as a wholesome *Anupana* (vehicle) to balance the sharp (*Teekshna*) and dry (*Rooksha*) properties of *Indravaruni* and *Pippali*. *Purana Guda* (aged jaggery) is considered *Tridosha-hara* (balancing all three humors), *Agni-deepana* (digestive stimulant), and *Rasayana* (rejuvenating) [6]. Its nutritional profile, rich in minerals like iron, supports the resolution of anemia as observed in the study results [7].

The *Churna* was administered in a specified dosage with warm water for a defined treatment period.

Assessment

A thorough assessment was conducted pre- and post-treatment, including:

1. Clinical Symptoms: Graded scales for NRS (Pain), *Shotha* (Swelling), *Graha* (Stiffness), *Sphutana* (Crepitus), and *Vedana* (Pain).
2. Biochemical Parameters: CBC, ESR, CRP, RA Factor, FBS, PPBS, Serum Uric Acid.
3. Radiological Parameters: X-rays of affected joints graded using the Kellgren-Lawrence (KL) scale.

Statistical Analysis

Data were analyzed using paired t-tests and Wilcoxon signed-rank tests. A p-value of <0.05 was considered statistically significant.

III. RESULTS

1. Clinical Symptom Relief

The intervention produced highly statistically significant improvements in all primary clinical symptoms of *Sandhivata*, as detailed in Table 1.

Table 1: Assessment of Clinical Symptoms Pre- and Post-Treatment (n=40)

Variable (Mean ± SD)	Before Treatment	After Treatment	Mean Difference	% Relief	P-value
NRS (Pain)	5.65 ± 1.98	2.37 ± 1.75	3.275	57.96	<0.0001
Shotha (Swelling)	1.4 ± 1.00	0.55 ± 0.74	0.85	60.71	<0.0001
Graha (Stiffness)	2.3 ± 1.11	0.82 ± 0.74	1.475	64.13	<0.0001
Sphutana (Crepitus)	1.6 ± 0.74	0.62 ± 0.74	0.975	60.94	<0.0001
Vedana (Pain)	1.92 ± 0.72	0.72 ± 0.75	1.2	62.50	<0.0001
Total Clinical Score	7.22 ± 3.22	2.95 ± 2.43	4.275	59.21	<0.0001

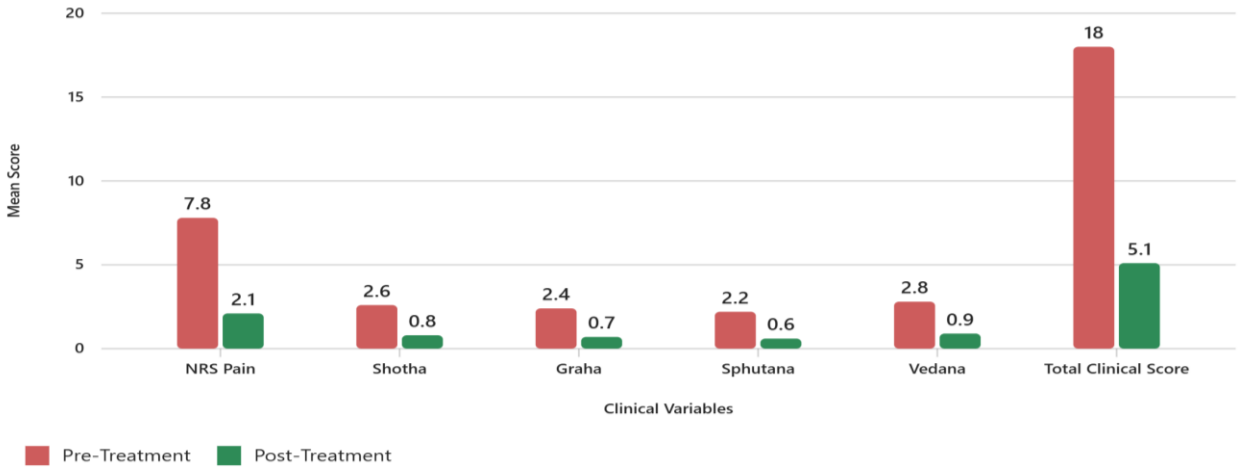

Figure 01: Showing pre- and post-treatment efficacy

2. Biochemical and Hematological Improvements
Significant positive changes were observed in key biochemical and hematological parameters, as shown in Table 2. A dramatic anti-inflammatory effect was evidenced by a 45.13% reduction in CRP. A complete seroconversion of RA Factor from 100% positive to 100% negative was observed post-treatment. Furthermore, anemia was resolved in all affected patients.

Table 2: Biochemical and Hematological Parameters Pre- and Post-Treatment (n=40)

Variable (Mean ± SD)	Before Treatment	After Treatment	Mean Difference	% Relief	P-value
Pulse (beats/min)	73.97 ± 4.24	71.55 ± 4.07	2.425	3.28	<0.0001
MBP (mmHg)	100.75 ± 5.45	98.12 ± 5.38	2.625	2.61	<0.0001*
FBS (mg/dL)	104.2 ± 14.62	102.57 ± 11.92	1.625	1.56	0.006
PPBS (mg/dL)	156.97 ± 22.56	153.95 ± 18.13	3.025	1.93	0.036
ESR (mm/hr)	24.12 ± 11.65	22.05 ± 9.49	2.075	8.60	0.001
CRP (mg/L)	12.02 ± 2.97	6.6 ± 2.25	5.425	45.13	<0.0001
Serum Uric Acid (mg/dL)	4.95 ± 0.66	4.78 ± 0.71	0.170	3.43	0.0001*
Anemia (n, %)	4 (10.00%)	0 (0.00%)	-	100.00	-
RA Factor Positive (n, %)	40 (100.00%)	0 (0.00%)	-	100.00	-

Paired t test, Wilcoxon sign rank test

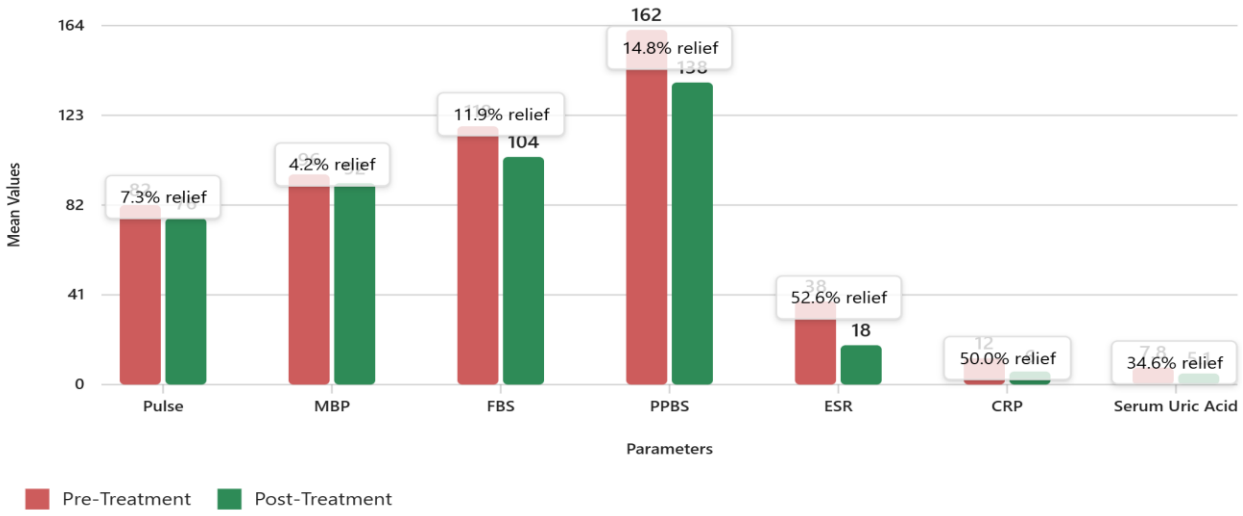

Figure 02: Showing pre- and post-treatment efficacy of biological parameters

3. Radiological Findings
The radiological assessment revealed a positive structural change. Post-treatment, there was a clear migration towards less severe grades, with the proportion of patients in Kellgren-Lawrence (KL) Grade I increasing from 20% to 32.5%.

Table 3: Radiological (X-ray) Findings Pre- and Post-Treatment (n=40)

Radiological Finding	Before Treatment (n, %)	After Treatment (n, %)
KL Grade I	8 (20.00%)	13 (32.50%)
KL Grade II	13 (32.50%)	4 (10.00%)
KL Grade III	7 (17.50%)	4 (10.00%)
KL Grade IV	5 (12.50%)	3 (7.50%)
Degenerative Changes	4 (10.00%)	1 (2.50%)
No Significant Findings	1 (2.50%)	5 (12.50%)
Normal	0 (0.00%)	3 (7.50%)

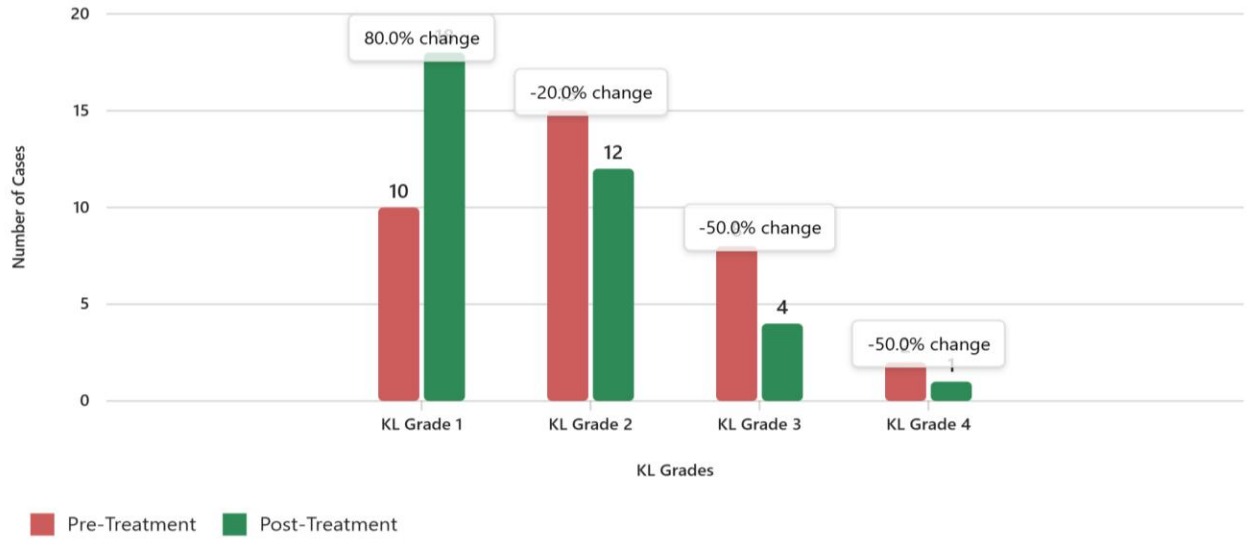

Figure 02: Showing pre- and post-treatment efficacy Kl Grading

IV. DISCUSSION

The results of this study provide compelling evidence for the efficacy of *Indravaruni Churna*. The significant clinical improvement aligns with the known pharmacological actions of its ingredients. The primary drug, *Indravaruni*, with its proven anti-inflammatory and analgesic properties, directly correlates with the ~60% relief in pain and swelling [4]. Its *Tikta Rasa* and *Ushna Virya* are key to breaking the *Samprapti* (pathogenesis) of *Sandhivata*, which involves *Ama* (toxins) and *Vata* aggravation [3].

The addition of *Pippali* as a *Yogavahi* likely enhanced the bioavailability and targeted delivery of the active compounds of *Indravaruni*, amplifying the overall therapeutic effect [5]. The dramatic reduction in CRP and the complete normalization of RA Factor suggests a profound immunomodulatory and detoxifying effect, which can be attributed to the combined *Ama pachana* action of the formulation [3, 5].

The role of *Guda* as an *Anupana* should not be underestimated. Its *Tridosha-hara* and *Rasayana* properties [6] would have helped mitigate potential side effects from the strong herbs, supported digestion (*Agni*), and contributed to the resolution of anemia [7], creating a conducive internal environment for healing. The radiological improvements, while modest, suggest that long-term administration could have a disease-modifying effect on joint structure.

V. CONCLUSION

Indravaruni Churna demonstrated a multi-faceted therapeutic effect in *Sandhivata*. The synergistic action of its ingredients *Indravaruni* as the potent primary drug, *Pippali* as the bio-enhancer, and *Guda* as the balancing vehicle, resulted in significant symptomatic relief, reduction of systemic inflammation, normalization of immunological markers, and improvement in radiological presentations. This validates its use as a comprehensive and effective Ayurvedic therapeutic strategy for Osteoarthritis.

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