



# From Tradition To Evidence: A Randomized Comparison Of Dhattura Patra Taila And Nirgundi Taila For Pain Relief In Knee Osteoarthritis

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## Abstract:

In Ayurveda, **Sandhigata Vāta** can be correlated with degenerative joint disorders such as Osteoarthritis. Osteoarthritis is the most common form of arthritis and is strongly associated with reduced mobility and disability, particularly affecting weight-bearing joints like the knee. This study investigates the therapeutic potential of Dhattūra Patra Taila for its *Vedanāhara* (analgesic) properties. A randomized controlled trial was conducted with 60 patients, comparing the test drug against the standard *Nirgundi Taila*. The results demonstrated that *Dhattūra Patra Taila* provided a 79.2% reduction in joint pain and significant improvements in swelling and mobility. The study concludes that *Dhattūra Patra Taila* is a potent, cost-effective, and safe topical intervention for degenerative joint disorders.

**Key words:** Sandhigata Vāta, Osteoarthritis, *Dhattūra Patra Taila*, *Vedanā*

## Introduction

### Background:

**Sandhigata Vāta** is classified under Vāta Vyādhi in all major Saṃhitās and Saṅgraha Granthas. Although classical texts do not provide a single, well-defined description of its etiology, the Caraka Saṃhitā explains that indulgence in causative factors (Nidāna Sevana) leads to aggravation of Vāta Doṣa. The vitiated Vāta localizes in the joints (Sandhi), producing symptoms such as *Vātapūrṇa Dṛti Sparśa* (a sensation similar to touching an air-filled bag), *Prasaraṇa-Ākuñcana Vedanā* (pain during extension and flexion), *Sandhi Śūla* (joint pain), and *Āṭopa* (crepitus or cracking sound in joints). While conventional treatments often rely

on NSAIDs that pose risks of gastrointestinal and renal side effects, Ayurveda offers localized therapies (*Sthānika Cikitsā*) to manage pain safely.

*Datura metel* Linn. (Family: Solanaceae) is traditionally recognized for its *Vātahara* and *Vedanāsthapana* properties. This research evaluates a specific formulation - *Dhattūra Patra Kalka Taila*, prepared in Sarsapa Taila (Mustard oil) base, to clinically validate its efficacy in managing the symptoms of Osteoarthritis.

**Aim:** To evaluate the clinical efficacy of *Dhattūra Patra Taila* in comparison with Nirgundi Taila in *Sandhigata Vāta*.

### Objectives:

1. To assess the reduction in symptoms of *Sandhigata Vāta*.
2. To introduce simple and cost-effective Āyurvedic drug.

### Methods:

- **Study Design:** A Randomized, Single-blind, Controlled clinical trial.
- **Sample Selection:** The study was carried out with 72 Patients presenting with the symptoms of *Sandhigata Vāta*, out of which 6 cases didn't attend for the 2<sup>nd</sup> follow-up, 3 cases were not interested to continue the treatment, 2 cases didn't follow the treatment on regular basis and 1 case noticed redness of the skin while undergoing the treatment. Therefore 60 patients were recruited from the outpatient and inpatient departments of S.V. Ayurvedic Hospital, Tirupati.
- **Ethical consideration:** In this study, efforts were made to ensure "no harm" to participants and to provide maximum benefit.
- **Informed consents:** Only those participants who were willing to give consent in the consent form were included in the study.
- **Ethical committee clearance:**
  - The Study synopsis was placed before the Institutional Ethical Committee of S.V Ayurvedic College, Tirupati. The Final acceptance was gained and Ethical clearance was obtained for the study.
  - Approval No: **IEC/SVAYC/DG/23/12** an interim report on the status of research was also approved in due course.
- **Inclusion criteria:**
  - Patients between the age group 30- 70 years were selected.
  - Patients having classical signs and symptoms of *Sandhigata Vāta* like Śūla, Śoṭha, Sparśa asahiṣṇuta, Sphutana, Akuñcana prasarana Vedanā were selected
  - Patient with Osteoporosis and Osteophyte changes were selected.
  - Obese patients.
  - Patients with the history of Trauma of Knee joint.
  - Patients suffering with Endocrine disorders mainly menopausal women.

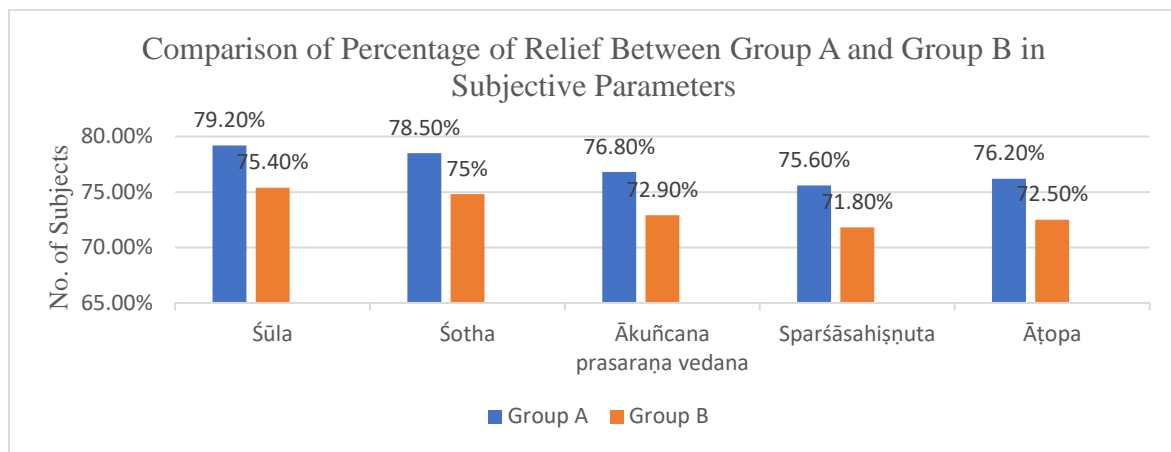
- **Exclusion criteria:**
  - Patients aged below 30 and above 70 years were excluded
  - Patients suffering with Carcinoma and Psoriatic arthritis
  - Patients suffering from Vāta rakta and Ankylosing arthritis.
  - Patients suffering with Polymyalgia and Rheumatoid arthritis.
  - Patients suffering from Tuberculosis.
- **Intervention Groups:**
  - **Group A (Experimental):** Application of *Dhattūra Patra Taila* via *Bāhya Abhyāṅga* (external massage) in the quantity sufficient twice daily.
  - **Group B (Control):** Application of *Nirgundi Taila* using the same protocol.
- **Duration:** The treatment was administered for 90 days.
- **Drug Preparation:** The fresh leaves of *Dhattūra (Datura metel* Linn.) were collected from the outskirts of Tirupati region. They were washed and shade dried. The fresh leaves of *Datura metel* Linn. were made into paste (*Kalka*) and added with mustard oil (*Sarṣapa Taila*). The test oil was prepared following the *Sneha Pāka* method, using fresh *Datura metel* Linn. leaf paste (*Kalka*), Mustard oil (*Sarṣapa Taila*) and water in 1:4:16 ratio. It was boiled on a medium flame till the attainment of *Sneha Siddhi Lakshanas*. Then the oil was filled in air tight bottles and prescribed to the patients.
- **Evaluation Method:** Improvements were measured using a standardized scoring scale for subjective symptoms like Śūla, Śoṭha, Ākuñcana prasaraṇa Vedanā, Sparśāsahiṣṇuta, Āṭopa and for objective symptoms ESR and CRP were measured.

## Results

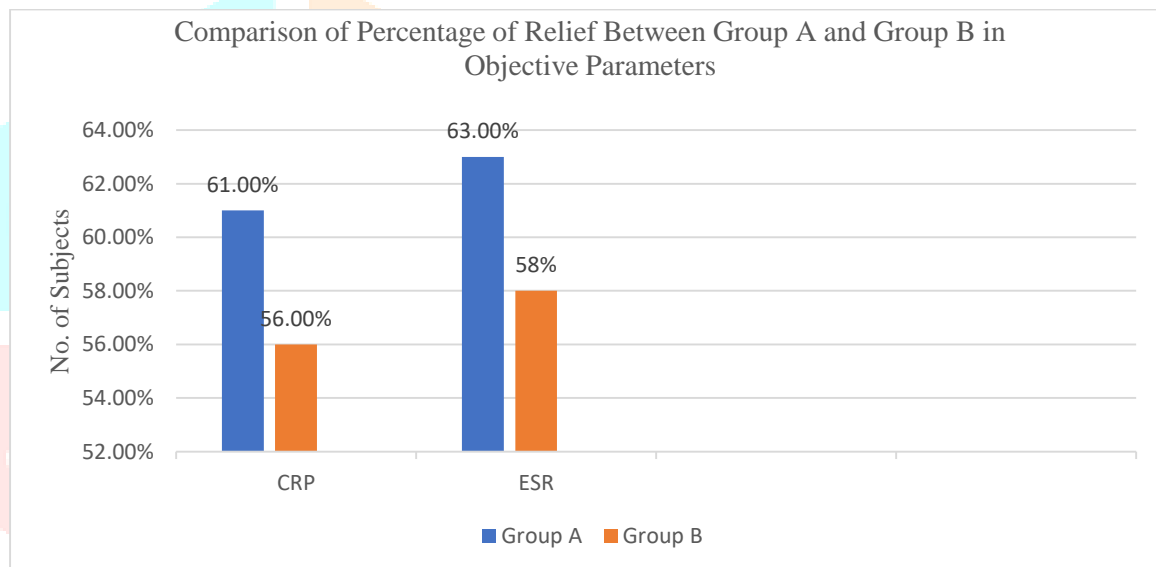
All information which were based on various parameters was gathered and Statistical analysis was carried out in terms of Mean (X), Standard Deviation (S.D), Standard Error (S.E), “Paired t- test” and the result was incorporated in terms of Probability “P”. The entire calculation was done in Graph pad Prism. There was a significant improvement in Subjective and Objective parameters in both the groups; however, the *Dhattūra Patra Taila* group exhibited a higher degree of recovery in acute symptoms.

### Comparative Relief Percentage:

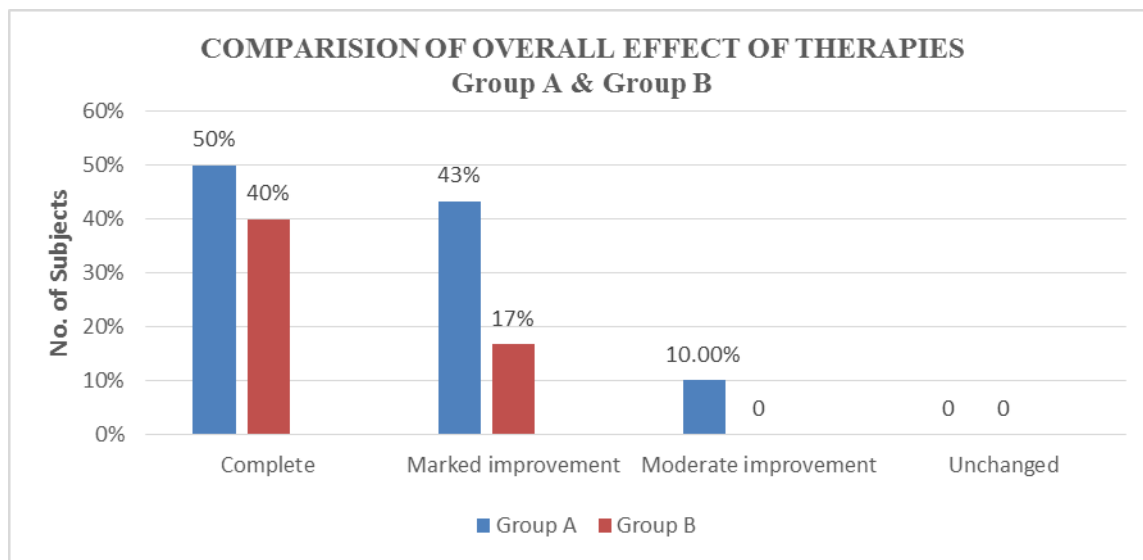
- **Sandhi Śūla:** Group A showed **79.2% relief**; Group B showed **75.4%**.
- **Sandhi Śoṭha:** Group A showed **78.5% relief**; Group B showed **74.8%**.
- **Ākuñcana prasaraṇa Vedanā:** Group A showed **76.8% relief**; Group B showed **72.9% relief**.
- **Sparśāsahiṣṇuta:** Group A showed **75.6% relief**; Group B showed **71.8% relief**.
- **Āṭopa:** Group A showed **76.2% relief**; Group B showed **72.5% relief**.



- **ESR: Group- A showed 63% Relief, Group- B showed 58% relief.**
- **CRP: Group- A showed 61% relief, Group- B showed 56% relief.**



- **Overall Efficacy:** It was observed that in **Group- A** that out of 30 cases, **Complete relief** was found in 15 cases i.e. 50%, **Marked relief** was found in 12 cases i.e. 40%, **Moderate improvement** was found in 3 cases i.e. 10% and unchanged cases were Nil, whereas in **Group-B** it was noticed that **Complete relief** was found in 12 cases i.e. 40%, **Marked relief** was found in 13 cases i.e. 43.3% and **Moderate improvement** was found in 5 cases i.e. 16.7% and **Unchanged condition** cases were Nil.



### Discussion:

The therapeutic success of Dhattūra Patra Taila is established through synergy of its Phytochemical components and its Ayurvedic pharmacological properties (Rasa- Guna- Virya- Vipaka- Prabhava).

- 1. Phytochemical Synergy:** *Datura metel* Linn. is rich in alkaloids like atropine, scopolamine which are primarily anti cholinergic but reduce nerve excitability when applied externally by alleviating pain. The transdermal scopolamine calms CNS mediated muscle tension, indirectly **easing joint restriction**. Compounds like **daturametelin B and 12  $\alpha$ - hydroxydaturametelin B** inhibit nitric oxide in macrophages reducing oxidative stress that damages joint tissues. Thus they support long term joint protection by **slowing degeneration and preventing cartilage breakdown**. **The withanolides and withametelins** as per the references available from the online articles exhibit potent **Anti-inflammatory effects** by inhibiting mediators like NF-kB and arachidonate 5-lipoxygenase, which is similar to COX-2 inhibition The presence of Flavonoids and Tannins, identified during the HPTLC and phytochemical screening of the leaf, helps mitigate synovial inflammation, thereby reducing Sandhi Śoṭha
- 2. Ayurvedic Pharmacological action:** The **Uṣṇa Vīrya** of Dhattūra patra along with the oil base (Sarsapa Taila) directly counters the Śīta and Rūkṣa guna of Vāta and helps in combating the symptoms like **Stabdhatā, Vedanā and Āṭopa**. The **Tikṣṇa guna** of Dhattūra Patra Kalka Taila allows deeper **penetration into Sandhi, Snāyu and Kaṇḍarā** which in turn improves local circulation, causing snigdhatā of Kaṇḍarā, Snāyu etc thereby relieving stiffness. The **Tikta- Kaṭu rasa** by means of its **āma pācana** property thereby helps in **reducing Śoṭha** in Sandhigata Vāta. **The Vāta- Kaphahara property** of Dhattūra Patra will relieve **Stabdhatā**, thereby help in easy mobility of joint. The **Uṣṇa vīrya, Madhura rasa and Guru guna** as per the scholars will act as **Vātahara and Vedanāhāra** there by reducing pain in the joint while flexion and extension i.e. **Ākuñcana prasaraṇa Vedanā**. The Madhura rasa of drug will act on Pitta reducing the **Sparśāsahiṣṇuta**. The **Madhura rasa along with the Guru guna** will **decrease the Vāta Doṣa aggravation** which is the main cause for the depletion of joint tissue, breakdown of cartilage, reduction of synovial fluid, creating joint space between the joints, increased khara guna associated with reduction in Kapha Doṣa leading to degenerative changes causing **Āṭopa**. In Ayurveda, Āma directly correlates with the inflammatory markers like CRP and pitta imbalance, weakened agni i.e. digestion leading to chronic inflammation. The Dhattūra Patra Kalka Taila, which has got many

**anti-inflammatory chemical constituents like Alkaloids, Proteins steroids, Glycosides, Flavonoids** might be the reason for **reduced CRP levels** as the drug reduces the stiffness of the joints.

- **3. Comparison with Nirgundi Taila:** While *Nirgundi Taila* is a Standard treatment for *Vāta* disorders, *Dhattūra* demonstrated a more potent *Vedanāhara* effect, likely due to its higher concentration of alkaloids that specifically target the peripheral nervous system and the additional presence of Quinones and Coumarins which show a potent Śoṭha hara effect. Quinones by means of their **redox modulation** and **antioxidant action** reduces oxidative stress, inflammation and tissue damage there by **relieving Pain, Swelling and degeneration**. Coumarins may act as **Anti-inflammatory** and **Analgesic** by stimulating lymphatic proteolysis to decrease edema and inhibiting COX-2 and LOX enzymes to suppress inflammatory mediators and scavenging free radicals to prevent tissue damage.

### Conclusion:

This study confirms that **Dhattūra Patra Taila** has shown clinically significant improvement as topical treatment for managing *Sandhigata Vāta*. It provides superior relief in pain intensity and joint swelling compared to the standard *Nirgundi Taila*. The formulation is safe for external use, easy to prepare, and offers a cost-effective alternative for the long-term management of chronic degenerative joint conditions without the systemic risks associated with conventional analgesics.

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