

# Low Back Pain Management through Bowel Lavage (*Panchaprasrutik Basti*)—A Single Arm Clinical Trial

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## Abstract

**Background:** Low back pain is a pervasive and often debilitating musculoskeletal condition that affects millions of people worldwide. Low back pain affects 619 million globally (10%) and may rise to 843 million by 2050. It causes 8% years lived with disability and 4.6% disability-adjusted life years in India, with a 1.2%–2.3%. *Ayurvedic* interventions offer potential relief, specifically *Panchaprasrutik Basti* (bowel lavage/enema). This study investigates *Basti*'s therapeutic effects on low back pain.

**Objectives:** To assess *Panchaprasrutik Basti*'s efficacy in reducing *Katishula* (low back pain) using the visual analog scale (VAS). Also, the efficacy of *Panchaprasrutik Basti* in the restriction of movement and tenderness of *Katishula* will be assessed using the coin test.

**Materials and Methods:** This was an interventional, open-label, single-arm, single-center, prospective study of a sample size of 35 patients. Inclusion criteria encompassed patients having symptoms of *Katishula* (lumbar pain), *Katigraha* (restriction of movement), *Sparshasahatva* (tenderness), and ages between 18 and 70 years. Therapeutic intervention in the study compromised *Panchaprasrutik Basti* (enema) for 7 days. Outcome measures included the VAS for pain severity and the coin test for restriction of movement and tenderness, comparing baseline and post-treatment data.

**Results:** Thirty-five participants completed the study. Statistical analysis showed significant improvement ( $p < 0.05$ ) in low back pain symptoms.

**Conclusion:** This study evaluated the effectiveness of *Panchaprasrutik Basti* (480 mL, 7 days) in managing low back pain. Results show significant symptom improvement and enhanced quality of life, validating *Ayurvedic* medicine as a safe and effective alternative therapy.

## Keywords

Enema, *Katishula*, low back pain, Panchakarma, *Panchaprasrutik Basti*

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## Introduction

Low back pain is a pervasive and often debilitating musculoskeletal condition that affects millions of people worldwide.<sup>1–3</sup> Characterized by discomfort, aching, or tension in the lower portion of the spine, low back pain can range from a dull constant ache to a sudden, sharp sensation that leaves the person incapacitated. Its prevalence is staggering, with studies suggesting that up to 80% of adults experience low back pain at some point in their lives. The prevalence of low back pain is alarming, with 619 million people affected in 2020, which is 10% of the global population and is anticipated to surge to 843 million people by 2050.<sup>4</sup> In India, low back problems account for approximately 8% of years lived

with disability (YLD) and 4.6% of disability-adjusted life years (DALYs) due to musculoskeletal disorders. Notably, DALYs related to low back issues increased from 1.2% to 2.3%.<sup>5</sup>

The impact of low back pain extends far beyond individual discomfort. It is a leading cause of disability globally,

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contributing significantly to decreased quality of life, reduced work productivity, and increased healthcare utilization. Low back pain is the top reason for doctor visits and a major contributor to healthcare expenditure.<sup>4</sup>

The current medical approach for this disease focuses on alleviating pain but lacks a curative treatment strategy. Moreover, extended use of pain medication such as non-steroidal anti-inflammatory drugs (NSAIDs) can have harmful consequences, including adverse effects on various organs. Empirical evidence supports the potential of *Ayurveda* and traditional medicine systems to relieve low back pain.<sup>6,7</sup>

Based on clinical presentation, this condition is termed *Katishula* in *Ayurveda* classics. *Katishula* comes under *Vata* (body humor) disorders.<sup>8</sup> Due to improper diet and improper lifestyle, *Vata dosha* (body humor) increases and minimizes the lubricant at that site. Since *Vata* is the factor responsible for bodily motions, its vitiation leads to the manifestation of pain, restriction of motion, and tenderness.

In *Ayurveda*, *Samhita* mentions the importance of dosha *Shodhana* (body humor purificatory). *Basti* (enema/bowel lavage) is the best treatment to treat all *Vata* disorders<sup>9</sup> and is mentioned as *Ardha Chikitsa* (half treatment) in classical text.<sup>10</sup> *Panchaprasrutik Basti*, which contains *Godugdha* (cow's milk), *Madhu* (honey), *Tila taila* (sesame seed oil), and *Go Ghrít* (cow's clarified butter), has a *Vata* pacifying and nourishing effect.<sup>11</sup>

In an effort to combat low back pain, this study explores the therapeutic potential of *Basti*. This treatment approach has demonstrated promising results in alleviating the symptoms of this condition.

## Objectives

### Primary Objective

To assess the efficacy of *Panchaprasrutik Basti* in pain reduction of *Katishula* (low back pain) using the VAS.

### Secondary Objective

To assess the efficacy of *Panchaprasrutik Basti* in restricting movement and tenderness of *Katishula* using the coin test.

## Materials and Methods

A clinical study was performed on the patients from OPD and IPD of the Panchakarma Department of Dr. D. Y. Patil Ayurveda Hospital and Research Centre, Pimpri, Pune, for 18 months. The Institutional Ethical Committee granted ethical clearance for the study on August 5, 2022, before starting the trial, with the reference number DYPCARC/IEC/510/2022. This trial adhered to Schedule Y of the Drugs and Cosmetics Act (1945, amended in 2005) of India, as well as the Indian Council of Medical Research ethical guidelines for

biomedical research on human participants and the GCP guidelines adopted from the World Medical Association—Declaration of Helsinki. This clinical study was prospectively registered in the Clinical Trials Registry of India CTRI/2023/01/049143. The trial was done after obtaining a signed consent form from the participants.

## Methodology

### Trial Design

This was an interventional, open-label, single-arm, single-center, prospective study of a sample size of 35 patients.

### Study Design

The patient was enrolled after CTRI registration. Patients were selected for *Katishula* after screening the subjects for inclusion criteria. Written consent was taken from patients for the trial. *Panchaprasrutik Basti* was given for 7 days. Assessment was done on the 1st and 7th day of the treatment.

## Selection of Patients

### Inclusion Criteria

Patients having symptoms *Katishula* (lumbar pain), *Katigraha* (restriction of movement), *Sparshasahatva* (tenderness), and aged between 18 and 70 years.

### Exclusion Criteria

K/c/o *Aamvata* (rheumatoid arthritis), *Vatrakta* (gout), *Garbhini* (pregnant lady), and low back pain resulting from spinal fractures, infections, and neoplasm.

## Intervention

The therapeutic intervention in the study was *Panchaprasrutik Basti* (enema). This intervention was administered for 7 days. To ensure quality, all drug authentication and standardization were done from Sudhatatva Pharmacy of Dr. D. Y. Patil Ayurveda Hospital and Research Centre, Pimpri, Pune, adhering to Good Manufacturing Practice (GMP) standards.

## Preparation of Basti (Enema)

*Basti dravya* (enema) was prepared by mixing all the ingredients as mentioned in Table 1, that is, *Godugdha* (cow milk) two *Prasruta* (192 mL), *Madhu* (honey), *Tila taila* (sesame seed oil), and *Go Ghrít* (cow's clarified butter) each 1 *Prasruta* (96 mL); this makes all total 480 mL. All these should be taken and churned well together. Before adding the clarified butter, sesame seed oil, and cow's milk and to lukewarm overheat. The *Basti dravya* (enema) was prepared in the following manner: honey, sesame seed oil, clarified butter, and cow's milk one after another.<sup>11</sup>

**Table 1.** Ingredients of *Panchaprasrutika Basti* and Their Textual Dose and Dose in Milliliter.

| Name of Drug | Textual Dose | Dose in Milliliter <sup>12</sup> |
|--------------|--------------|----------------------------------|
| Godugdha     | 2 prasruta   | 192 mL                           |
| Goghrita     | 1 prasruta   | 96 mL                            |
| Tila taila   | 1 prasruta   | 96 mL                            |
| Madhu        | 1 prasruta   | 96 mL                            |

Source: Tripathi and Samhita.<sup>11</sup>

### Method of Administration of *Panchaprasrutik Basti*

Localized massage was done with sesame seed oil, and localized steam was done to *Kati* and thigh regions. Then, the patient was asked to lie in the left lateral position with their left leg folded at the knee joint. The anus and nozzle (*Basti Netra*) are lubricated, and the *Panchaprasrutik Basti* of 480 mL was slowly injected into the rectum. The nozzle was withdrawn, and gentle strokes were applied to promote retention. The patient rests in a supine position, retaining the medication for maximum absorption, and then observes the retention time of the enema. This was repeated for 7 days.

### Outcome Measures

To evaluate the effectiveness of the treatment, the baseline data (initial measurements) with the data collected before and after administering the medication, using both subjective (patient-reported) and objective (clinically measured) parameters.

#### Primary Outcome Measure

Assess the severity of pain in Table 2 with gradation and the VAS in Table 3 used to assess objective pain.<sup>13</sup>

#### Secondary Outcome Measures

It included changes in the symptoms associated with low back pain. Assessing the restriction of movement (Table 4) and tenderness (Table 5) was done using the coin test (Table 6).

Patients were asked to pick up the coin from the ground, and gradations were done according to the severity of pain.

## Results

### Status of Enrolled Patient

Of a total of 36 enrolled participants, 35 completed the study, while 1 patient was withdrawn.

### Statistical Analysis

The data were then entered into EPI-info version 3.5 (software) and exported to the Statistical Package for Social

**Table 2.** *Katishula* (Severity of Pain Scale).

| Assessment Criteria | Grade | Description |
|---------------------|-------|-------------|
| No pain             | 0     | Normal      |
| Mild pain           | 1     | Mild        |
| Moderate pain       | 2     | Moderate    |
| Severe pain         | 3     | Severe      |

**Table 3.** Visual Analog Scale (VAS) for Pain.

| Grade | VAS | Description                            |
|-------|-----|----------------------------------------|
| 0     | 0–1 | No pain                                |
| 1     | 1–3 | Painful walk without limping           |
| 2     | 4–6 | Painful walks with limping and support |
| 3     | 7–9 | Painful can walk only with support     |
| 4     | 10  | Painful, unable to walk                |

Source: Ayurvedic Pharmacopeia of India.<sup>13</sup>

**Table 4.** *Katigraha* (Gradation Scale for Restriction of Movement).

| Assessment Criteria                           | Grade | Description |
|-----------------------------------------------|-------|-------------|
| No restriction                                | 0     | Normal      |
| Partially restricted without painful movement | 1     | Mild        |
| Partially restricted with painful movement    | 2     | Moderate    |
| Fully restricted                              | 3     | Severe      |

**Table 5.** *Sparshasahatva* (Gradation Scale to Measure Tenderness).

| Assessment Criteria                      | Grade | Description |
|------------------------------------------|-------|-------------|
| No pain                                  | 0     | Normal      |
| Patient winces                           | 1     | Mild        |
| Patient winces and withdraws the part    | 2     | Moderate    |
| Patient does not allow to touch the part | 3     | Severe      |

**Table 6.** Coin Test (Test to Measure Restriction of Movement and Tenderness).

| Description                 | Grade |
|-----------------------------|-------|
| Can easily pick the coin    | 0     |
| Can pick with minimal pain  | 1     |
| Can pick with moderate pain | 2     |
| Cannot pick                 | 3     |

Science (SPSS) version 21 for analysis. The collected data were subjected to statistical analysis using descriptive and comparative methods aligned with the predefined primary and secondary outcomes. Quantitative variables were summarized using descriptive statistics, presented as mean  $\pm$  standard deviation (SD) or median (range), depending on the variable's distribution pattern. The Wilcoxon signed-rank test

**Table 7.** Description of Demographic Profile.

| Data       | Criteria    | N = 35 | Percentage |
|------------|-------------|--------|------------|
| Age        | 31–40 years | 14     | 40%        |
| Gender     | Male        | 21     | 60%        |
|            | Female      | 14     | 40%        |
| Occupation | Army        | 1      | 2.9%       |
|            | Farmer      | 1      | 2.9%       |
|            | Housewife   | 7      | 20.0%      |
|            | Job         | 12     | 34.3%      |
|            | Labor       | 3      | 8.6%       |
|            | Nurse       | 1      | 2.9%       |
|            | Parlor      | 2      | 5.7%       |
|            | Police      | 2      | 5.7%       |
|            | Shopkeeper  | 1      | 2.9%       |
|            | Student     | 1      | 2.9%       |
|            | Sweeper     | 1      | 2.9%       |
|            | Teacher     | 2      | 5.7%       |
|            | Therapist   | 1      | 2.9%       |
| Diet       | Veg         | 20     | 57.14%     |
|            | Mixed       | 15     | 42.86%     |
| Prakruti   | Pitta       | 3      | 8.57%      |
|            | Pitta-Kapha | 3      | 8.57%      |
|            | Pitta-Vata  | 2      | 5.71%      |
|            | Vata        | 6      | 17.14%     |
|            | Vata-Kapha  | 7      | 20.00%     |
|            | Vata-Pitta  | 14     | 40.00%     |

**Note:** N, total number of patients.

was used to evaluate observations on an ordinary scale. Statistical analysis of *Panchaprasrutik Basti* in subjective and objective parameters of LBP was found to be highly significant ( $p < 0.05$ ), indicating that trial drugs were effective in relieving pain, restriction of movement, and tenderness. Following 7 days of therapy, a noteworthy reduction in the mean score was observed.

### Demographic Profile

The majority of trial participants were within the age range of 31–40 years, with a higher proportion of male participants (60%) compared to female participants (40%). A significant proportion is jobs (34.3%), followed by housewives (20%). The data analysis revealed that 57.14% of participants were vegetarians. It was found that *Vata-Pitta Prakriti* (40%) had the highest proportion of subjects (Table 7).

### Analysis of Disease-specific Clinical Parameters

Statistical analysis shows the treatment had a substantial impact, with an impressive result. The Wilcoxon signed-rank

test was used to evaluate observation measured on an ordinary scale with  $p$  value  $< 0.05$ . Seven days treatment result shows *Katishula* (pain) 52.13%, *Katistambha* (restriction in movement) 59.62%, and *Sparshasahatva* (tenderness) 76.19% improvement with objective parameter VAS 57.8% and coin test 63.64% improvement, indicating a marked positive effect. Here, the mean value suggests that grades decrease significantly after intervention in Table 8.

Throughout the observation period, most of the participants got clear skin and improved in a complexion that shows *Panchaprasrutik Basti* also acts as *Varnya* (improved skin complexion) as stated by the authors in the text.<sup>11</sup>

### Discussion

Demographic factors did not significantly influence the prevalence of low back pain or its symptoms in this study (Table 7).

*Panchaprasrutik Basti* treatment significantly improved *Katishula* symptoms from day 1 to day 7. Subjective measures showed reductions in pain (52.13%), stiffness (59.62%), and tenderness (76.19%). Objective measures revealed improvements in pain intensity via VAS (57.48%) and functional ability via coin test (63.64%). Results were statistically significant ( $p < 0.05$ ), with large effect sizes (52.13%–76.19%). Consistent improvements across measures provide strong evidence for *Panchaprasrutik Basti*'s efficacy in addressing lower back pain, particularly in reducing tenderness and enhancing functional capacity. These findings support the treatment's potential as a comprehensive solution for *Katishula* management. Statistical significance and large effect sizes confirm clinical relevance.

### The Action of Drug Used in Panchaprasrutik Basti

The *Basti* formulation, comprising *Dugdha* (milk), *Ghrita* (clarified butter), *Madhu* (honey), and *Tila taila* (sesame seed oil), works through a synergistic action of its ingredients. Milk provides nourishment to the tissues and soothes irritated nerves, while its *Snigdha* (unctuousness) quality helps counteract *Vata* aggravation.<sup>14</sup> Clarified butter, with its lipophilic nature, penetrates deep into the tissues, carrying other ingredients with it and promoting cellular rejuvenation. It also possesses anti-inflammatory properties and aids in *Vata* pacification.<sup>15</sup> Honey, with its *Yogavahi* property (capacity to carry some other thing to distant places and make it available at the place of its utilization), enhances the absorption and efficacy of other ingredients, while its *Lekhana* (scraping) action helps remove ama (toxins) from the tissues.<sup>16</sup> Sesame seed oil, rich in antioxidants and essential fatty acids, improves local circulation, reduces inflammation, and deeply pacifies *Vata* due to its *Ushna* (heat) and *Snigdha* (unctuousness) qualities.<sup>17</sup> Together, these ingredients balance the aggravated doshas (primarily *Vata*), improve tissue metabolism, enhance local circulation, reduce inflammation, and

**Table 8.** Effect of *Panchaprasrutik Basti* in Subjective and Objective Parameters.

| Variables                                    | Day 1<br>(Mean ± SD) | Day 7<br>(Mean ± SD) | Statistical Analysis<br>(Wilcoxon Signed-rank Test) |
|----------------------------------------------|----------------------|----------------------|-----------------------------------------------------|
| <i>Katishula</i> (pain)                      | 2.7 ± 0.47           | 1.3 ± 0.71           | 52.13%                                              |
| <i>Katistambha</i> (restriction in movement) | 1.5 ± 0.85           | 0.6 ± 0.6            | 59.62%                                              |
| <i>Sparshasahatva</i> (tenderness)           | 0.6 ± 0.7            | 0.14 ± 0.35          | 76.19%                                              |
| VAS                                          | 7.2 ± 1.27           | 3.08 ± 1.6           | 57.48%                                              |
| Coin test                                    | 1.6 ± 0.73           | 0.57 ± 0.56          | 63.64                                               |

**Note:** SD, standard deviation; VAS, visual analog scale.

promote overall healing in the lower back region. This multifaceted action explains the observed improvements in pain (*Katishula*), restriction in movement (*Katigraha*), and tenderness (*Sparshasahatva*).

### The Probable Mechanism of *Basti* (Enema)

*Basti*, an *Ayurvedic* treatment, operates through three mechanisms: local effects, systemic effects, and neural pathways. Locally, *Basti* stimulates bowel movements, cleansing the colon and activating the mucosal immune system. Systemically, it regulates fluid and electrolyte balance through the colonic mucosa, maintaining homeostasis. Neural pathways influence gut function and motility via the enteric nervous system (ENS), modulating local reflexes, hormones, and digestive tract motility.

In the colon, absorption occurs through various mechanisms: sodium is actively absorbed (95% efficiency), water passively follows sodium absorption, chloride is coupled with bicarbonate secretion and sodium transport, potassium is secreted or absorbed based on the luminal concentration, and bicarbonate is secreted against an electrochemical gradient.

Rectal absorption involves passive diffusion, influenced by fluid availability, rectal mucus properties, contents, and wall motility. Absorption enhancers, such as surfactants, are necessary for satisfactory administration, making rectal absorption suitable for peptide-like drugs and avoiding the first-pass effect.

### Therapeutic Mechanism of *Panchaprasutik Basti* in Low Back Pain

#### *Katishula* (Lower Back Pain)

The anti-inflammatory properties of *Ghrta* (clarified butter) and *Tila taila* (sesame seed oil) could reduce inflammation in the lower back muscles and tissues. The *Brihamana* (nourishing) qualities of milk and clarified butter may support tissue repair. The overall combination helps balance *Vata Dosha* and the warm nature of the *Basti*, which could improve blood circulation in the lower back, potentially reducing pain.<sup>18</sup>

#### *Katigraha* (Restriction in Movement)

The lubricating properties of *Ghrta* (clarified butter) and *Tila taila* (sesame seed oil) could help improve flexibility in the lower back joints and muscles. The muscle-relaxing effects of the warm *Basti* might help reduce muscle tension and stiffness. Improved circulation from the treatment could enhance the delivery of nutrients to the affected area, potentially improving mobility. The *Vata*-pacifying nature of the ingredients might address the root cause of stiffness according to *Ayurvedic* principles.<sup>18</sup>

#### *Spararshasahatva* (Tenderness)

The soothing properties of the ingredients, particularly *Madhu* (honey) and *Dugdha* (milk), could help reduce skin and nerve sensitivity. The anti-inflammatory effects of the *Basti* might decrease overall sensitivity in the affected area. By potentially reducing underlying inflammation and improving tissue health, the treatment might make the area less reactive to touch. The balancing effect on *Vata dosha* could help normalize sensation in the area, as hypersensitivity is often associated with *Vata* imbalance in *Ayurveda*.

## Conclusion

The comprehensive study evaluating the effect of *Ayurvedic* interventions, administration of *Panchaprasrutik Basti* in a dose of 480 mL for a period of 7 days in managing low back pain, including restriction in movement and tenderness as well as improvement in quality of life. The study demonstrates the potential of *Ayurvedic* medicine as a viable and safe alternative for managing low back pain.

## Abbreviations

**DALYs:** Disability-adjusted life years; **NSAIDs:** Non-steroidal anti-inflammatory drugs; **SPSS:** Statistical Package for Social Science; **VAS:** Visual analog scale; **YLD:** Years lived with disability.

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### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Ethical Approval

The Institutional Ethical Committee granted ethical clearance for the study on August 5, 2022, before starting the trial, with the reference number DYPCARC/IEC/510/2022.

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### Informed Consent

Informed consent was obtained from all the participants in the study.

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