

# Kukkutanda Basti (ALBU-PRO Bio-Enemata) vs. Intravenous Albumin in the Management of Hypoalbuminemia: A Comparative Pilot Clinical Study

**<sup>1,\*</sup>Dr Dharmesh Chauhan**

Associate professor, Department of RSBK, Parul institute of Ayurveda, Parul University, Vadodara, Gujarat  
[drdharmesh16@gmail.com](mailto:drdharmesh16@gmail.com)

**<sup>2</sup>Dr Misbah Rangwala**

Chief intensivist, Parul Sevashram Hospital, Parul University, Vadodara, Gujarat  
[misbah.rangwala@gmail.com](mailto:misbah.rangwala@gmail.com)

**<sup>3</sup>Dr Hemant Toshikhane**

Dean & principal, Faculty of Ayurveda, Parul Institute of Ayurveda, Parul university, Vadodara, Gujarat

**<sup>4</sup>Dr Anitha H**

Professor & Head, Department of RSBK, Parul Institute of Ayurveda, Parul university, Vadodara, Gujarat

<https://doi.org/10.63001/tbs.2026.v21.i01.pp1015-1025>

## KEYWORDS

*Kukkutanda Basti, ALBU-PRO Bio-Enemata, Hypoalbuminemia, Albumin Supplementation, Ayurvedic Interventional Study, Basti Therapy, Nutrient Enema, Clinical Pilot Trial, Serum Albumin, Ayurvedic Pharmaceutics*

Received on: 13-12-2025

Accepted on: 06-02-2026

Published on:  
12-02-2026

## ABSTRACT

**Background:** Ayurveda offers a wide spectrum of therapeutic modalities, among which *Basti* therapy plays a significant role due to its systemic action through rectal administration. Kukkutanda Basti, a formulation derived from egg yolk, has been traditionally used to enhance nutritional status. Considering the high cost, limited efficacy, and adverse reactions associated with intravenous albumin therapy, there is a growing need to explore affordable and safer Ayurvedic alternatives for managing hypoalbuminemia.

**Aim:** To evaluate the pharmaceutical characteristics and clinical efficacy of ALBU-PRO Bio-Enemata (Kukkutanda Basti) and to compare its therapeutic outcomes with standard intravenous albumin supplementation in patients with hypoalbuminemia.

**Methods:** This open-labelled, randomized pilot clinical study included 24 patients diagnosed with hypoalbuminemia, equally allocated into a trial group (Kukkutanda Basti) and a control group (IV albumin infusion). The intervention was administered for 7 days, followed by assessment on day 15. Subjective parameters such as pedal edema, fatigue, nausea, vomiting, and abnormal weight gain were recorded, along with objective markers including serum albumin, total protein, and Muehrcke's lines. Pharmaceutical preparation and analytical assessment of the basti drava were conducted according to Ayurvedic standards.

**Results:** Both groups demonstrated statistically significant improvement ( $p < 0.05$ ) in all measured parameters when comparing pre- and post-treatment values. Group A (Kukkutanda Basti) showed an average symptom relief of 79.79%, while Group B (IV albumin) showed 83.24% relief. Comparative analysis revealed no statistically significant difference ( $p > 0.05$ ) between the two groups, indicating that Kukkutanda Basti is clinically comparable to intravenous albumin infusion in improving subjective and objective manifestations of hypoalbuminemia.

**Conclusion:** Kukkutanda Basti demonstrated therapeutic efficacy equivalent to intravenous albumin supplementation in managing hypoalbuminemia. Given its accessibility, cost-effectiveness, and minimal adverse effects, it may serve as a viable alternative treatment option, particularly in resource-limited settings. Larger, multi-center studies are warranted to confirm these findings and further establish its role in clinical practice.

## 1. INTRODUCTION

Ayurveda, a traditional and holistic system of medicine practiced widely across the Indian subcontinent, offers a vast repertoire of therapeutic modalities. These include numerous *Vanaspatika* (herbal), *Jangama* (animal-derived) formulations, and specialized *Panchakarma* procedures that address a wide range of disease conditions. Among these therapeutic approaches, *Basti* holds a particularly significant place. Administered through the colon, *Basti* therapy exerts systemic effects throughout the entire body—from head to toe—by facilitating the removal of accumulated impurities and restoring physiological balance.

Within this broad domain of *Basti* treatments, *Kukkutanda Basti*, which incorporates components derived from egg yolk, has emerged as a promising intervention for nutritional support. Egg yolk contains highly bioavailable proteins along with essential vitamins and minerals such as zinc and copper, making it a potent nutritional source. Considering these attributes, *Kukkutanda Basti* has the potential to play a vital role in addressing conditions characterized by nutritional deficiency, particularly *hypoalbuminemia*.

*Hypoalbuminemia* is a medical condition marked by abnormally low levels of albumin in the blood. It commonly arises as a consequence of underlying disease processes such as septicemia, liver cirrhosis, or nephrotic syndrome. Because albumin is a crucial blood protein responsible for transporting essential nutrients to various parts of the body, its deficiency can lead to significant physiological

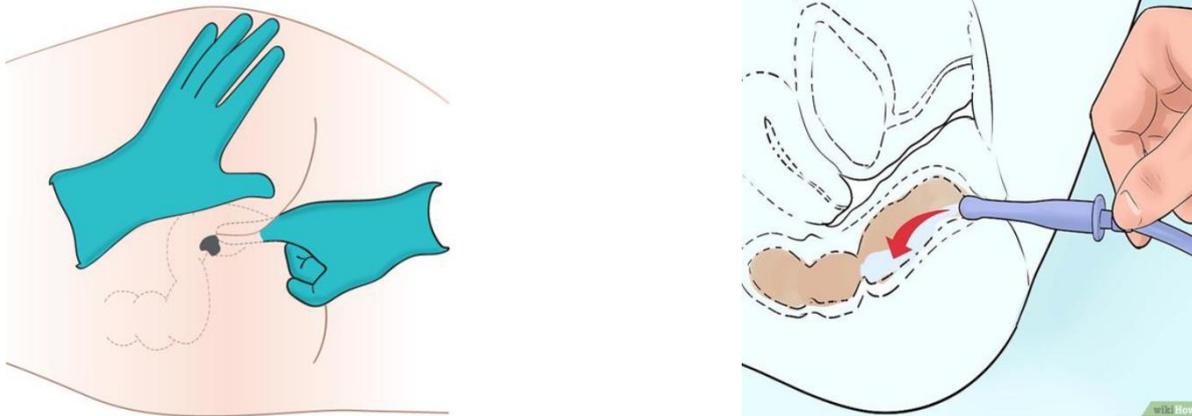
disturbances and impaired nutritional status. Therefore, interventions that can safely and effectively improve albumin levels carry considerable therapeutic value.

Given the nutritive potency of egg yolk and the therapeutic merits of *Basti* as described in Ayurveda, *Kukkutanda Basti* may offer a beneficial approach for improving serum albumin levels in patients with *hypoalbuminemia*. Additionally, this therapy is easily accessible and cost-effective, making it suitable for individuals across diverse socioeconomic backgrounds.

In light of these potential advantages, the present research work is designed to evaluate the efficacy of *Kukkutanda Basti* in the management of *hypoalbuminemia*.

### 1.1 NEED FOR STUDY

For Ayurveda to achieve true global recognition, it is essential to validate its therapeutic practices through scientifically designed and systematically executed research. Classical Ayurvedic procedures such as *Basti*, *Vamana*, *Virechana*, and many others require structured clinical evaluation to demonstrate their efficacy and safety in a manner that aligns with contemporary medical standards. Although Ayurveda holds a wealth of traditional knowledge, including numerous folklore-based remedies used for conditions ranging from minor ailments to severe pathologies, many of these practices have yet to be fully explored or documented scientifically. One such under-researched therapeutic intervention is *Kukkutanda Basti*, traditionally used in the management of *hypoalbuminemia*.



**Figure 1: Rectal Administration**

Hypoalbuminemia, characterized by abnormally low serum albumin levels, often necessitates intravenous albumin transfusion in modern medical practice. However, the high cost of injectable albumin makes this therapy inaccessible for many patients, resulting in inadequate treatment and potentially life-threatening consequences. Even when albumin transfusion is administered, the therapeutic gain remains limited—typically producing only a modest increase of about 0.6 to 0.8 g/dL in serum albumin levels after multiple (5–6) infusions. Furthermore, albumin transfusion is associated with several adverse drug reactions (ADR), including vomiting, skin rashes, itching, fever with rigor, breathlessness, tachycardia, and in more severe cases, pulmonary edema. It is contraindicated in patients with compromised cardiac function, particularly those with low ejection fraction, and in rare instances, the reaction may be so severe that the patient can go into hypovolemic shock.

These limitations highlight a clear need for an alternative, affordable, and safer therapeutic approach for managing hypoalbuminemia. Considering the nutritional richness and therapeutic potential of egg yolk, combined with the systemic action of Basti therapy, the use of Kukkutanda Matra Basti may offer a promising solution. It has the potential to provide nutritional support, elevate serum albumin levels, and minimize adverse effects,

while remaining accessible to patients across various socioeconomic backgrounds.

In view of these considerations, the present study is designed to systematically evaluate the effectiveness of Kukkutanda Basti in the management of hypoalbuminemia and to compare its outcomes with conventional intravenous albumin supplementation.

### 1.2 AIM

The primary aim of this study is to systematically evaluate the therapeutic efficacy of Kukkutanda Basti in the management of hypoalbuminemia and to compare its outcomes with the currently accepted modern intervention, intravenous albumin supplementation. Since hypoalbuminemia significantly compromises nutritional status and overall physiological functioning, identifying an alternative therapy that is safe, affordable, and effective is of great clinical importance.

This study therefore seeks to determine whether Kukkutanda Basti, owing to its nutritive and bioavailable components, can serve not only as a supportive measure but also as a *therapeutically comparable or superior intervention* to IV albumin infusion in improving serum albumin and total protein levels.

### 1.3 OBJECTIVES

**1. Preparation of Basti Drava with Kukkutanda:** This objective involves the systematic preparation of the Kukkutanda-

based Basti formulation following classical Ayurvedic guidelines. It includes identifying the correct proportions of egg yolk and accompanying ingredients, maintaining proper processing techniques, and ensuring that the final preparation is standardized, consistent, and suitable for therapeutic administration. The goal is to develop a formulation that maintains nutritional integrity while adhering to Ayurvedic pharmaceuticals (Rasa Shastra & Bhaishajya Kalpana) principles.

## 2. Analysis of Kukkutanda Basti Drava:

Beyond preparation, it is essential to conduct a detailed analysis of the Kukkutanda Basti Drava to understand its physical, chemical, and potentially bioactive properties. This may include evaluating its protein content, lipid profile, stability, sterility, viscosity, and overall compatibility for rectal administration. Such analysis helps validate the biological plausibility of its therapeutic action and ensures safety and quality before clinical use.

Additionally, this analysis forms the scientific foundation required for future replication, validation, and potential integration into broader therapeutic protocols.

## 3. To evaluate the efficacy of Kukkutanda Basti in alleviating the objective and subjective symptoms of Hypoalbuminemia

This objective focuses on the clinical evaluation phase.

- Objective parameters may include measurable biochemical markers such as serum albumin, serum total protein, liver function parameters, and nutritional assessment scores. Monitoring these will help determine whether Kukkutanda Basti significantly improves biochemical deficiencies associated with hypoalbuminemia.
- Subjective parameters involve patient-reported symptoms such as fatigue, weakness, edema, poor appetite, or other clinical manifestations commonly associated with low albumin levels.

Evaluating these allows for a more holistic understanding of patient well-being, in alignment with Ayurvedic principles that emphasize both physiological and experiential healing.

Overall, this objective aims to assess whether Kukkutanda Basti produces clinically meaningful improvements, not only in laboratory values but also in the patient's overall sense of health and functioning.

## 2. REVIEW OF LITERATURE

The available scientific and historical literature provides valuable insight into the therapeutic potential, limitations, and evolution of nutrient-based enemas, forming a strong conceptual foundation for the present investigation into *Kukkutanda Basti*.

One of the most relevant modern studies is “*Effect of Egg White and Honey Enema on Ulcerative Colitis in an Animal Model*” by Seyed Vahid Hosseini and colleagues. This experimental research, conducted on forty rats, aimed to evaluate the therapeutic impact of rectally administered egg white and honey after inducing ulcerative colitis with 2% acetic acid. The animals were divided into multiple groups and treated with different enema formulations, including egg white, honey, a combination of both, and a standard reference medication (Asacol). Over six days of treatment, the researchers assessed biochemical markers such as TNF- $\alpha$  and malondialdehyde, as well as histopathological changes in colonic tissue. The findings demonstrated that honey alone produced significant anti-inflammatory and antioxidant effects, while egg white and honey together did not outperform honey alone. This study provides contemporary scientific evidence that nutrient-rich rectal preparations can exert measurable local therapeutic effects, supporting the rationale for exploring similar nutrient-based basti preparations in Ayurveda.

A broader historical perspective is offered by the article “*Bottoms Up: A History of Rectal Nutrition from 1870 to 1920*” by Justin Barr and colleagues. This review documents the

widespread medical practice of rectal feeding during a period when oral or gastric feeding was often impossible, such as in severe gastrointestinal diseases. Physicians of that era utilized nutrient enemas containing substances such as milk, eggs, glucose, and beef tea, believing that the rectal mucosa could absorb essential nutrients. Although later scientific advancements revealed the limitations of rectal absorption for substantial caloric intake, this practice played a crucial role before the development of intravenous fluid therapy and parenteral nutrition. This historical exploration helps to contextualize modern Ayurvedic procedures like Kukkutanda Basti, showing that nutrient enemas have long been considered as supportive therapeutic interventions.

Another classical contribution comes from J.W.A. Mackenzie's 1943 paper "*The Nutrient Enema*", published in *Archives of Disease in Childhood*. Mackenzie examined the physiological potential of nutrient enemas in pediatric patients who were unable to tolerate oral feeding. Although an abstract is unavailable, subsequent citations and academic commentary reveal that he studied the rectal absorption of glucose, electrolytes, and predigested proteins. His work was among the earliest attempts to understand rectal absorption mechanisms scientifically, demonstrating that some nutrients—particularly glucose and amino acids—could indeed be absorbed through the rectal mucosa, even if not in sufficient quantities to replace oral feeding entirely. This early scientific inquiry provides foundational knowledge relevant to modern therapeutic enemas and Ayurvedic basti practices.

In another historical and scientific paper, "*An Inquiry Into the Value of Rectal Feeding*" (1911), W. Langdon Brown critically evaluated the therapeutic claims surrounding rectal nutrition. Published in the Proceedings of the Royal Society of Medicine, this work examined clinical experiences and physiological evidence

to determine whether rectal feeding could meaningfully supplement or replace oral nutrition. Brown discussed nitrogen balance, nutrient absorption limitations, and the comparative inefficiency of rectal feeding, ultimately concluding that although the rectum can absorb certain nutrients, its capacity is insufficient for complete nutritional support. His analysis reflects an early shift toward evidence-based practice, emphasizing the importance of scientifically validating therapeutic claims—exactly the purpose of the present research on Kukkutanda Basti.

Finally, the study titled "*Clinical Study to Evaluate the Efficacy of Kukkutanda Ksheera Basti in Garbhashosha*" by Dr. Sumaiya M. Hakki represents Ayurvedic clinical work investigating egg-based basti formulations. While not indexed in major scientific repositories, this dissertation-level research explored the therapeutic effects of a milk-and-egg-based basti preparation in the treatment of *Garbhashosha*, a condition characterized by tissue depletion. The study likely involved assessment of clinical symptoms, Ayurvedic diagnostic parameters, and overall improvements in nourishment (*dhatu-poshan*). Although detailed methodology or results are unavailable online, the study supports the Ayurvedic tradition of using egg-derived preparations rectally to promote nutritional strengthening, aligning closely with the conceptual basis of Kukkutanda Basti for hypoalbuminemia.

Together, these articles—ranging from modern experimental research to classical historical analyses and Ayurvedic clinical work—demonstrate a longstanding interest in the therapeutic use of nutrient enemas. They collectively justify further scientific exploration into Kukkutanda Basti as a potentially effective, affordable, and minimally invasive intervention for hypoalbuminemia.

**Table 1: Literature Review Summary Table**

Sl. No.	Title of Article	Authors	Study Type	What the Researchers Did / Key Findings
1	Effect of Egg White and Honey Enema on Ulcerative Colitis in an Animal Model	Seyed Vahid Hosseini, Ehsan Abdulwahid Majeed, Abodrab, Hajar Khazraei, Mozhdeh Zamani & Maral Mokhtari	Experimental Animal Study (Rat Model)	<ul style="list-style-type: none"> <li>Induced ulcerative colitis using 2% acetic acid.</li> <li>Divided rats into 5 groups: saline, egg white, honey, standard drug (Asacol), and egg-white+honey combination.</li> <li>Administered enemas rectally for 6 days (2 mL/day).</li> <li>Evaluated histopathology, TNF-<math>\alpha</math>, and MDA (oxidative stress marker).</li> </ul> Finding: Honey significantly reduced inflammation; egg white showed limited benefit; combination was not superior.
2	Bottoms Up: A History of Rectal Nutrition from 1870–1920	Justin Barr, Natalie B. Gulrajani, Alison Hurst, Theodore N. Pappas	Historical Medical Review	<ul style="list-style-type: none"> <li>Reviewed medical literature from 1870–1920 on rectal feeding practices.</li> <li>Analyzed nutrient enemas historically used (milk, eggs, beef tea, glucose).</li> <li>Discussed why physicians used rectal feeding when oral intake was impossible.</li> <li>Documented decline of the practice as scientific evidence showed minimal nutrient absorption.</li> </ul> Finding: Rectal feeding once widely used, later largely abandoned due to poor efficacy.
3	The Nutrient Enema	J. W. A. Mackenzie	Clinical & Physiological Evaluation (1943)	<ul style="list-style-type: none"> <li>Explored nutrient enemas in pediatric patients unable to take oral nutrition.</li> <li>Studied rectal absorption of glucose, amino acids, electrolytes, and predigested proteins.</li> <li>Highlighted limits of caloric/nutrient uptake via rectum.</li> </ul> Finding: Some nutrients can be absorbed rectally, but insufficient for full nutrition.
4	An Inquiry Into the Value of Rectal Feeding	W. Langdon Brown	Clinical/Scientific Review (1911)	<ul style="list-style-type: none"> <li>Evaluated claims about effectiveness of rectal nutrient administration.</li> <li>Assessed nitrogen balance and physiological capacity of colon to absorb nutrients.</li> <li>Critically reviewed whether rectal feeding can substitute for oral feeding.</li> </ul> Finding: Rectal feeding has very limited nutritional value; benefits were overstated historically.
5	Clinical Study to Evaluate the Efficacy of Kukkutanda Ksheera Basti in Garbhashosha	Dr. Sumaiya M. Hakki (B.A.M.S)	Ayurvedic Clinical Study (Thesis/Dissertation)	<ul style="list-style-type: none"> <li>Evaluated Kukkutanda Ksheera Basti (egg + milk basti) in managing Garbhashosha (tissue depletion).</li> <li>Likely involved symptom scoring, nutritional assessment, and classical Ayurvedic diagnostic approach.</li> <li>Full published data not available online; appears to be an academic dissertation.</li> </ul>

### 3. METHODS

The present study will be conducted on a minimum of 24 patients diagnosed with hypoalbuminemia, selected from both the ICU and general wards of the hospital. This research follows an open-label, randomized clinical trial design and is structured as a pilot study to assess the preliminary therapeutic efficacy of *Kukkutanda Basti* compared with standard intravenous albumin supplementation. The sample is divided into two groups of 12 participants each, ensuring an even distribution for comparative analysis. The total treatment

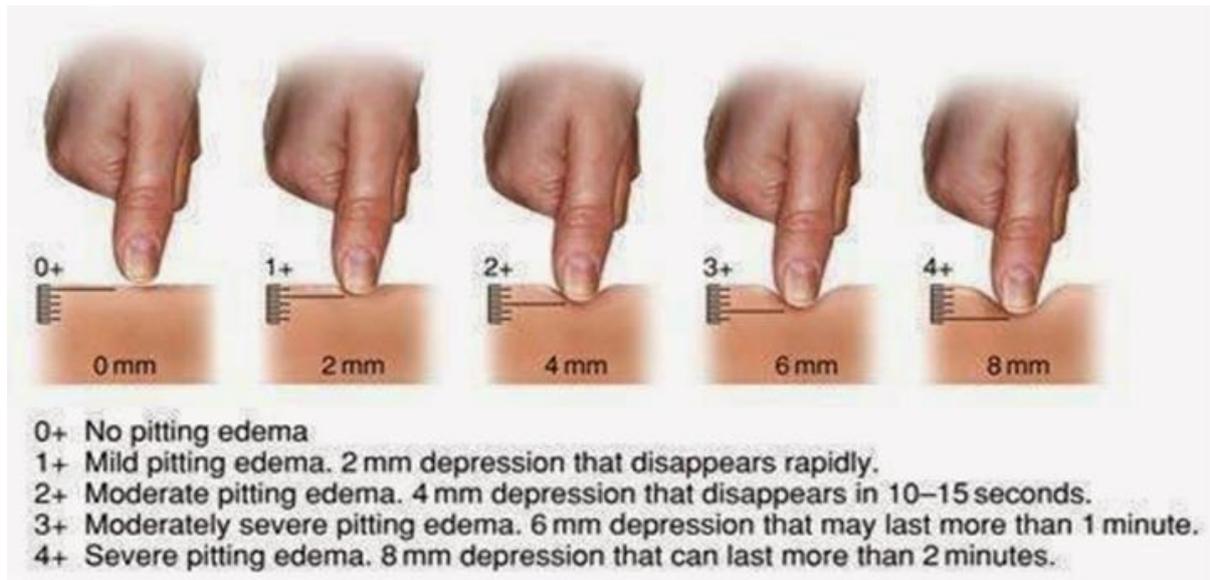
duration is seven days, followed by a post-treatment follow-up assessment on day 15 to evaluate sustained outcomes.

Eligible participants will include individuals aged 18 to 80 years with documented serum albumin levels below 3.4 g/dL, irrespective of gender, socioeconomic background, or religion. Patients will be excluded if they fall outside the specified age range or if they present with serious anorectal conditions such as hemorrhoids, fissures, anorectal abscesses, fistulae, or malignancies. Additional exclusion criteria include a diagnosis of irritable bowel

syndrome (IBS), anal incontinence, pregnancy, lactation, or unwillingness to provide informed consent.

Diagnosis of hypoalbuminemia will primarily be based on serum albumin values  $<3.4$  g/dL, supplemented by ultrasonography (USG) when clinically required. Both subjective and objective parameters will be recorded. Subjective assessments include evaluation of pedal edema, fatigue, nausea, vomiting, and

abnormal weight gain, symptoms that commonly accompany reduced serum albumin levels. Objective assessment will include the presence of Muehrcke's lines, which indicate chronic hypoalbuminemia. Laboratory investigations for all participants will include Complete Blood Count (CBC), C-Reactive Protein (CRP), Liver Function Test (LFT), Renal Function Test (RFT), urine routine microscopy (Urine R/M), total serum protein, and serum albumin.



**Figure 2: Pedal Edema**

The intervention for the trial group will consist of Kukkutanda Basti, prepared using a standardized formulation. The basti drava will be prepared by homogenizing 30 mL of egg yolk, to which 5 mL of madhu (honey) and a pinch of Saindhava Lavana are added to form a uniform mixture. This preparation will be filled into a ready-to-use ALBU-PRO enemata pouch to ensure easy administration. The control group will receive 20 g of intravenous albumin infusion, procured from a certified and authenticated pharmaceutical supplier.

The basti procedure will follow classical Ayurvedic steps. During Poorva Karma (pre-procedure), patients will receive a proctoclysis enema on the first day to evacuate fecal matter from the rectal ampulla, ensuring optimal absorption of the administered medicated enema. During Pradhana Karma (main

procedure), the prepared basti drava will be administered rectally using a red rubber catheter attached to a 50 mL syringe. Following administration, during Paschat Karma (post-procedure), patients will be positioned in the left lateral posture for 30 minutes, and gentle tapping of the hips will be performed to facilitate retention and distribution of the medicine.

Prior to participation, written informed consent will be obtained from each patient after clearly explaining the study's purpose, procedure, and expected outcomes. The study is planned to be completed within the stipulated research period and adheres to ethical guidelines. All clinical observations and laboratory data will be subjected to appropriate statistical analysis to determine the significance of findings. The dissertation will be presented in English,

supplemented with Sanskrit Ayurvedic terminology as required. Inferences will be drawn based on measurable outcomes, clinical observations, and post-treatment laboratory readings.

#### 4. RESULTS AND DISCUSSION

In the present clinical study, a total of 24 patients diagnosed with hypoalbuminemia were included, with 12 patients enrolled in the study group (Group A) and 12 in the control group (Group B). All participants successfully completed the full treatment course. Diagnosis of hypoalbuminemia was primarily based on classical signs and symptoms described in Ayurvedic literature, supported by modern laboratory investigations to confirm low serum albumin and to rule out other possible clinical conditions. Routine hematological tests were performed in all patients to ensure overall health assessment and to exclude coexisting pathologies that might influence treatment outcomes.

The demographic distribution showed variation across age groups. In Group A, 4 patients belonged to the 18–40 age group, 3 to the 41–

60 group, and 4 to the 61–80 group. In Group B, 7 patients were between 18–40 years, 2 between 41–60, and 1 between 61–80 years. Gender distribution revealed that Group A consisted of 7 female and 5 male patients, whereas Group B included 4 females and 8 males. Regarding religion, most participants were Hindu, with 11 out of 12 patients in Group A and all 12 in Group B identifying as Hindu. Marital status also showed similarity between groups, with 11 married and 1 unmarried participant in each group.

Dietary habits showed that the majority of participants in both groups followed a vegetarian diet. Group A included 11 vegetarians and 1 mixed-diet individual, while Group B had 10 vegetarians and 2 mixed-diet individuals. Occupational distribution demonstrated a wide variety of backgrounds, including business professionals, farmers, housewives, students, and laborers. Addiction patterns varied slightly between the groups: in Group A, 7 had no addictions, 3 smoked, and 3 consumed alcohol; in Group B, 7 were addiction-free, 1 smoked, 5 consumed alcohol, and 1 used gutkha.

#### 4.1 OVERALL TREATMENT EFFECTS

**Table 2: Effect of therapy according to % relief in parameters in Group A & B.**

Comparison of % relief in parameters in Group A & B		Group A		Group B				
Symptoms	BT	AT	Relieved	% Relief	BT	AT	Relieve d	% Relief
Pedal edema	28	12	16	57.14	24	5	19	79.17
Fatigue	24	4	20	83.33	27	4	23	85.19
Nausea	18	1	17	94.44	15	2	13	86.67
Vomiting	10	0	10	100.00	9	0	9	100.00
Abnormal weight gain	15	2	13	86.67	13	4	9	69.23
Muehrcke line	28	12	16	57.14	24	5	19	79.17
Average % Relief			79.79				Average % Relief	83.24

The therapeutic outcome was measured according to percentage relief in both subjective and objective parameters. In Group A, pedal edema showed 57.14% relief, fatigue

83.33%, nausea 94.44%, vomiting 100%, abnormal weight gain 86.67%, and Muehrcke's lines 57.14%, with an average relief of 79.79%. In Group B, pedal edema showed 79.17%

relief, fatigue 85.19%, nausea 86.67%, vomiting 100%, abnormal weight gain 69.23%, and Muehrcke's lines 79.17%, resulting in an average relief of 83.24%.

Statistical analysis revealed significant improvement ( $p < 0.05$ ) between pre- and post-treatment values across all parameters in both groups, indicating that both Kukkutanda Basti and albumin infusion were effective. However, when comparing the two treatments directly, no statistically significant difference ( $p > 0.05$ ) was observed in the level of improvement between the groups. This demonstrates that both therapies are equally effective in alleviating the symptoms associated with hypoalbuminemia.

Based on these findings, the null hypothesis is rejected, and the alternative hypothesis is accepted, confirming that *Kukkutanda Basti* is effective in the management of hypoalbuminemia, offering an improvement comparable to intravenous albumin infusion.

#### 4.2 DISCUSSION ON THE PROBABLE MODE OF ACTION

The probable mechanism underlying the therapeutic action of *Kukkutanda Basti* can be explained through a combination of Ayurvedic principles and modern physiological understanding. Basti therapy is known to promote systemic absorption through the colonic mucosa. The components of the Kukkutanda Basti formulation—primarily egg yolk, honey, and Saindhava Lavana—possess properties that facilitate both absorption and therapeutic effect.

Egg yolk provides a homogeneous, nutrient-dense medium, rich in proteins, fats, and essential micronutrients. These components help create a solution capable of permeating the colonic mucosa efficiently. Honey contributes soothing, demulcent, and mild antimicrobial properties, while also enhancing viscosity and absorption. Saindhava Lavana (rock salt) plays an important physiological role due to the presence of sodium ions ( $\text{Na}^+$ ), which support mucosal absorption through sodium channels.

Sodium also regulates osmotic gradients, making the solution more readily absorbable.

Additionally, mildly irritant substances in the formulation help stimulate gentle peristaltic movement, facilitating the retention and systemic uptake of the drug. The presence of salt can also assist in clearing threadworms or other minor parasitic elements in the lower bowel, which could otherwise interfere with nutrient absorption.

By combining these properties, Kukkutanda Basti delivers a preparation that is structurally suitable for mucosal uptake and may support systemic nourishment. Optimizing the solution to be as close to isotonic as possible improves retention and prevents rapid expulsion, further enhancing therapeutic effect.

#### 5. CONCLUSION

Every scientific study must culminate in meaningful conclusions, and the interpretation of results plays a central role in validating the study's objectives. In the present clinical research, the therapeutic outcomes were assessed by calculating the percentage relief experienced by each patient across both subjective and objective parameters. This allowed for a systematic evaluation of the efficacy of the interventions administered to the two study groups.

In Group A, which received *Kukkutanda Basti*, comparison of pre-treatment and post-treatment values demonstrated a statistically significant improvement ( $p < 0.05$ ) across all measured parameters. This indicates that the therapy produced meaningful clinical benefits and was effective in addressing the symptoms associated with hypoalbuminemia. The average relief observed in Group A was 79.79%, reflecting substantial symptomatic improvement following treatment.

Similarly, in Group B, which received intravenous albumin supplementation, the statistical analysis also revealed a significant change between pre- and post-treatment values ( $p < 0.05$ ) for all parameters, confirming the

effectiveness of the standard therapy. The average relief in Group B was 83.24%, indicating a slightly higher improvement compared to the trial group.

However, when the effects of both treatments were compared directly, the results showed no statistically significant difference ( $p > 0.05$ ) between the two groups for any of the parameters—including pedal edema, fatigue, nausea, vomiting, abnormal weight gain, and the presence of Muehrcke's lines. This suggests that *Kukkutanda Basti* is comparably effective to albumin infusion in improving the clinical manifestations of hypoalbuminemia.

Based on these observations and statistical findings, the null hypothesis is rejected, and the alternative hypothesis is accepted, establishing that *Kukkutanda Basti* is indeed effective in the management of hypoalbuminemia. This supports the potential of a low-cost, accessible Ayurvedic intervention as an alternative to conventional albumin therapy.

### 5.1 FURTHER SCOPE OF STUDY

The present study was conducted within limited conditions, including restricted time, limited resources, and a relatively small sample size. While the results are promising, a larger study population would strengthen the statistical validity and provide deeper insight into the mechanism of action of the *Kukkutanda Basti* formulation. Future research may explore biochemical pathways, absorption mechanisms, duration of therapeutic effect, and long-term safety.

Additionally, expanding the investigation into comparative and multi-center trials may help establish broader clinical acceptance. Further work could also evaluate whether *Kukkutanda Basti* can help reduce the dependence on modern pharmacological albumin supplementation, especially in resource-limited settings. These steps would collectively contribute to positioning this Ayurvedic intervention within a more comprehensive therapeutic framework.

### REFERENCES:

1. Bumin in calorically restricted, nondiseased individuals: a systematic review. *Am J Med.* 2015;128(9):1023, e1-e22.
2. Cederholm T, Bosaeus I, Barazzoni R, et al. Diagnostic criteria for malnutrition - an ESPEN consensus statement. *Clin Nutr.* 2015;34(3):335-340.
3. Cederholm T, Barazzoni R, Austin P, et al. ESPEN guidelines on definitions and terminology of clinical nutrition. *Clin Nutr.* 2017;36(1):49-64.
4. Fleck A, Raines G, Hawker F, et al. Increased vascular permeability: a major cause of hypoalbuminaemia in disease and injury. *Lancet.* 1985;1(8432):781-784.
5. Schulman CI, King DR. Pediatric fluid resuscitation after thermal injury. *J Craniofac Surg.* 2008;19(4):910-912.
6. Soeters PB, Grimble RF. The conditional role of inflammation in pregnancy and cancer. *Clin Nutr.* 2013;32(3):460-465.
7. Soeters PB, Grimble RF. Dangers, and benefits of the cytokine mediated response to injury and infection. *Clin Nutr.* 2009;28(6):583-596.
8. Riddell MR, Winkler-Lowen B, Chakrabarti S, Dunk C, Davidge ST, Guilbert LJ. The characterization of fibrocyte-like cells: a novel fibroblastic cell of the placenta. *Placenta.* 2012;33(3):143-150.
9. Selkov SA, Selutin AV, Pavlova OM, Khromov-Borisov NN, Pavlov OV. Comparative phenotypic characterization of human cord blood monocytes and placental macrophages at term. *Placenta.* 2013;34(9):836-839.
10. Challis JR, Lockwood CJ, Myatt L, Norman JE, Strauss JF 3rd, Petraglia F. Inflammation and pregnancy. *Reprod Sci.* 2009;16(2):206-215.
11. Shinohara M, Mirakaj V, Serhan CN. Functional metabolomics reveals novel active products in the DHA metabolome. *Frontiers Immunol.* 2012;3:81.
12. Soeters PB. Macronutrient metabolism in starvation and stress. *Nestle' Nutr Inst Workshop Ser.* 2015;82:17-25.
13. Oian P, Maltau JM, Noddeland H, Fadnes HO. Transcapillary fluid balance in pre-eclampsia. *BJOG.* 1986;93(3):235-239.

14. Avila A, Warshawski F, Sibbald W, Finley R, Wells G, Holliday R. Peripheral lymph flow in sheep with bacterial peritonitis: evidence for increased peripheral microvascular permeability accompanying systemic sepsis. *Surgery*. 1985;97(6):685-695.
15. Charash WE, Saba TM, Lewis EP, Lewis MA. Pulmonary and peripheral lymph protein clearance during bacteremia after surgery. *Am J Physiol*. 1988;255(6 Pt 2):H1421-H1428.
16. Gosling P, Sanghera K, Dickson G. Generalized vascular permeability and pulmonary function in patients following serious trauma. *J Trauma*. 1994;36(4):477-481.
17. Fleck A. Computer models for metabolic studies on plasma proteins. *Ann Clin Biochem*. 1985;22 (pt 1):33-49.
18. Bergström J, Fuhrst P, Nore'e LO, Vinnars E. Intracellular free amino acid concentration in human muscle tissue. *J Appl Physiol*. 1974;36(6):693-697.
19. Bergstrom JP, Larsson J, Nordstrom H, et al. Influence of injury and nutrition on muscle water and electrolytes: effect of severe injury, burns and sepsis. *Acta Chir Scand*. 1987;153(4):261-266.
20. Pirlich M, Schutz T, Spachos T, et al. Bioelectrical impedance analysis is a useful bedside technique to assess malnutrition in cirrhotic patients with and without ascites. *Hepatology*. 2000;32(6):1208-1215.
21. Chaudhury C, Mehnaz S, Robinson JM, et al. The major histocompatibility complex-related Fc receptor for IgG (FcRn) binds albumin and prolongs its lifespan. *J Exp Med*. 2003;197(3):315-322.
22. Andersen JT, Dalhus B, Viuff D, et al. Extending serum half-life of albumin by engineering neonatal Fc receptor (FcRn) binding. *J Biol Chem*. 2014;289(19):13492-13502.
23. Kaysen GA. Biochemistry and biomarkers of inflamed patients: why look, what to assess. *Clin J Am Soc Nephrol*. 2009;4(suppl 1): S56-S63.
24. Cheng LT, Tang LJ, Chen HM, Tang W, Wang T. Relationship between serum albumin and pulse wave velocity in patients on continuous ambulatory peritoneal dialysis. *Vascular Health Risk Management*. 2008;4(4):871-876.
25. Fulks M, Stout RL, Dolan VF. Albumin and all-cause mortality risk in insurance applicants. *J Insur Med*. 2010;42(1):11-17.