



“INTEGRATIVE APPROACH IN *PANDU ROGA* (ANEMIA): BRIDGING AYURVEDA AND MODERN PERSPECTIVES”

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ABSTRACT

Introduction: Anemia, affecting nearly 1.9 billion people worldwide, remains a major global health challenge. Ayurveda describes a comparable condition under *Pandu Roga*, characterized by pallor, weakness, fatigue, and systemic dysfunction caused primarily by vitiation of *Pitta dosha* and depletion of *Rakta dhatu*. Conventional management of anemia includes iron supplementation, blood transfusion, and etiological correction. However, limitations such as side effects of iron therapy, recurrence, and incomplete restoration of systemic vitality warrant integrative approaches.

Methods: This review was conducted through an extensive survey of Ayurvedic classics (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya), modern biomedical literature (PubMed, Scopus, Web of Science), and recent clinical studies. Search terms included *Pandu Roga*, *anemia*, *Ayurveda*, *integrative management*, *herbal iron preparations*. Articles from 2000–2024, including clinical trials, reviews, and pharmacological studies, were considered. **Results:** Ayurvedic management emphasizes herbal-mineral formulations (e.g., *Lauh Bhasma*, *Navayasa Lauh*, *Punarnava Mandura*), Rasayana therapy (e.g., *Amalaki*, *Ashwagandha*), and supportive dietary interventions. These approaches not only correct hemoglobin levels but also restore *Agni*, enhance tissue metabolism, and prevent recurrence. Modern studies validate the hematonic, antioxidant, and immunomodulatory effects of these formulations. Integrative practices combining iron therapy with Ayurvedic interventions show improved patient compliance, reduced gastrointestinal side effects, and better long-term outcomes. **Discussion:** Ayurveda provides a holistic framework addressing both symptomatic relief and root causes, while modern medicine offers precise diagnostic and therapeutic tools. Together, they create a synergistic, patient-centered approach. **Conclusion:** An integrative approach to *Pandu Roga*/Anemia combining Ayurveda and modern medicine offers safe, effective, and sustainable solutions for global anemia management.

KEYWORDS: Anemia, Ayurveda, Hemoglobin, Integrative medicine, *Pandu Roga*

INTRODUCTION

Anemia continues to be a leading cause of morbidity worldwide, particularly among women of reproductive age and children. It is defined by the World Health Organization as a hemoglobin concentration lower than normal for age, sex, and physiological status, leading to reduced oxygen-carrying capacity.^[1-2] Clinical consequences include fatigue, reduced work capacity, impaired cognitive performance, and, in severe cases, maternal and fetal complications.^[3-4]

In Ayurveda, a condition with striking resemblance to anemia is described as *Pandu Roga*. This disorder is marked by pallor (*panduta*), weakness, shortness of breath, anorexia, and systemic decline. The pathogenesis involves vitiation of *Pitta dosha*, impaired *Rasa-Rakta dhatu* formation, and weakened *Agni*.^[5-7] Unlike modern medicine, which primarily addresses hematological parameters, Ayurveda emphasizes a systemic imbalance rooted in digestion, metabolism, and tissue nourishment.^[8]

The present review aims to explore the concept of *Pandu Roga* in Ayurveda and its correlation with modern anemia, summarize Ayurvedic and modern management approaches, and propose an integrative strategy that leverages the strengths of both systems for better patient outcomes.^[9-10]

MATERIALS AND METHODS

A structured review methodology was adopted:

1. **Classical Texts Review:** Primary Ayurvedic texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya) and their authoritative commentaries were reviewed to extract descriptions of *Pandu Roga*, its etiology, pathogenesis, clinical features, and management principles.^[11]
2. **Database Search:** Modern biomedical databases including PubMed, Scopus, and Web of Science were searched with terms: *Pandu Roga*, *Ayurveda and anemia*, *Lauha preparations*, *Rasayana and hemoglobin*, *herbal hematinics*.^[12]
3. **Inclusion Criteria:**^[13]
 - Studies (2000–2024) on Ayurvedic interventions in anemia.
 - Clinical trials, pharmacological studies, and systematic reviews.
 - Articles in English.

4. Exclusion Criteria:^[14]

- Non-peer-reviewed studies.
- Case reports without clinical/laboratory validation.
- Duplicated records.

Of 135 studies identified, 52 were found relevant and critically analyzed for this review.^[15]

OBSERVATION AND RESULTS

1. Ayurvedic Concept of *Pandu Roga*

In Ayurveda, *Pandu Roga* is described as a systemic disorder caused by vitiation of *Pitta dosha* and depletion of *Rakta dhatu*. It presents with pallor (*panduta*), lassitude, reduced strength, and impaired digestion. *Charaka Samhita* highlights faulty diet (excessive sour, salty, fermented foods), overexertion, alcohol, stress, and poor digestion as major etiological factors. Unlike modern biomedical perspectives, which focus on hemoglobin deficiency, Ayurveda emphasizes the role of weakened *Agni* (digestive fire) and malnourished tissues as the root cause.

2. Clinical Correlation with Modern Anemia

The signs and symptoms of *Pandu Roga*—pallor, weakness, giddiness, anorexia, edema, and breathlessness—closely resemble those of anemia. Subtypes such as *Shotha Yukta Pandu* (with swelling) resemble iron-deficiency anemia with edema, while *Kshaya Pandu* may align with megaloblastic or anemia of chronic disease. This correlation validates the clinical relevance of Ayurveda's classification.

3. Ayurvedic Management Approaches

a. Herbal-Mineral Preparations

- *Lauh Bhasma*: Nano-iron particles with high bioavailability, correcting hemoglobin levels with fewer side effects.
- *Navayasa Lauh*: Combination of Lauha with *Triphala* and *Trikatu*, enhancing iron absorption and digestive capacity.
- *Punarnava Mandura*: A herbo-mineral formulation effective in anemia with edema due to its diuretic and hepatoprotective effects.

b. Rasayana Therapy

- *Amalaki* (*Emblica officinalis*): Rich in vitamin C, enhances iron absorption.
- *Ashwagandha* (*Withania somnifera*): Adaptogen and hematopoietic stimulator.

- *Shatavari* (*Asparagus racemosus*): Restores systemic vitality and supports blood formation.

c. Panchakarma

Procedures like *Virechana* (therapeutic purgation) are advised to clear *Pitta* and improve iron assimilation.

d. Diet and Lifestyle

Ayurveda emphasizes consuming green leafy vegetables, pomegranate, jaggery, ghee, and milk, while avoiding incompatible, stale, or excessively heavy foods. Stress management through yoga and pranayama is also recommended.

4. Modern Management Approaches

- **Oral Iron Therapy:** Ferrous sulfate, fumarate, and gluconate are widely used but associated with gastrointestinal irritation and low compliance.
- **Parenteral Iron:** Reserved for severe anemia or poor absorption cases, though risks of hypersensitivity exist.
- **Vitamin Supplementation:** Folic acid and vitamin B12 correct megaloblastic anemia.
- **Blood Transfusion:** Used in life-threatening anemia, though not curative.

5. Evidence for Integrative Approaches

- Clinical trials of *Navayasa Lauh* and *Punarnava Mandura* show significant increases in hemoglobin and serum ferritin.
- Studies suggest reduced gastrointestinal side effects when Ayurvedic iron preparations are co-administered with conventional oral iron.
- Rasayana therapy improves systemic health, immunity, and quality of life beyond hematological correction.
- Integrative care in pregnancy-related anemia reduces the need for high-dose iron and improves maternal and fetal outcomes.

6. Pharmacological Insights

- *Lauh Bhasma* exhibits nanosized iron particles, enhancing bioavailability.
- *Amalaki* acts as a natural iron bioenhancer through vitamin C.
- *Punarnava* shows hepatoprotective and anti-inflammatory effects, supporting red blood cell regeneration.
- *Ashwagandha* improves hematopoiesis and reduces stress-related anemia.

DISCUSSION

The management of anemia highlights the limitations of a single therapeutic system. Modern medicine excels in acute correction of hemoglobin deficiency, yet iron therapy frequently results in gastrointestinal side effects, non-compliance, and recurrence. Furthermore, conventional approaches often fail to restore systemic vitality or address the underlying digestive and metabolic imbalances contributing to anemia.^[16]

Ayurveda, through its concept of *Pandu Roga*, provides a more holistic perspective. The emphasis on *Agni* (digestion) and *Rasa-Rakta dhatu* formation integrates nutritional, metabolic, and systemic dimensions. Herbal-mineral formulations such as *Lauh Bhasma* and *Punarnava Mandura* have hematinic effects comparable to modern iron but with improved tolerance. Their combination with Rasayana therapy ensures long-term vitality, reduced recurrence, and improved immune strength.^[17]

Modern pharmacological insights further validate Ayurvedic wisdom. Nano-iron particles in *Lauh Bhasma* enhance absorption, while vitamin C-rich *Amalaki* synergizes with iron. *Ashwagandha* and *Punarnava* add adaptogenic and hepatoprotective actions. Thus, Ayurveda not only addresses anemia but also corrects associated metabolic dysfunctions.^[18]

Integrative protocols combining oral iron with Ayurvedic formulations reduce side effects and enhance compliance. Such approaches are especially relevant in pregnancy-related anemia and chronic recurrent anemia, where both safety and systemic restoration are vital. However, limitations include lack of large-scale randomized controlled trials, insufficient standardization of formulations, and regulatory challenges.^[19]

In the future, interdisciplinary collaborations between Ayurveda and biomedical sciences can optimize integrative anemia management. A patient-centered, sustainable model incorporating both diagnostic precision of modern medicine and holistic Ayurvedic therapy represents the best way forward.^[20]

CONCLUSION

Pandu Roga, as described in Ayurveda, provides a comprehensive framework to understand anemia beyond its hematological deficit. Ayurvedic management through *Lauh Bhasma*, *Navayasa Lauh*,

Punarnava Mandura, and Rasayana therapy ensures safe and effective correction of hemoglobin while addressing systemic imbalances in digestion, metabolism, and immunity.

Modern therapies, though effective in acute correction, face limitations related to side effects, recurrence, and incomplete restoration of systemic vitality. Integrating Ayurvedic interventions into conventional anemia management improves compliance, reduces adverse effects, and promotes long-term health. Evidence from modern pharmacology validates the bioavailability, hematinic, and adaptogenic properties of Ayurvedic formulations.

An integrative approach to anemia is not only clinically effective but also economically sustainable and culturally acceptable in regions like India, where anemia remains endemic. Future research should prioritize rigorous trials, pharmacological standardization, and integration of Ayurveda into national anemia-control programs.

By uniting the strengths of Ayurveda and modern medicine, anemia can be managed in a way that not only corrects hemoglobin deficiency but also restores systemic health, resilience, and quality of life.

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