

A COMPREHENSIVE REVIEW ON THE MANAGEMENT OF GARBHINI PANDU (W.S.R. TO IRON DEFICIENCY ANEMIA IN PREGNANCY) THROUGH AYURVEDA

Dr. Anju Yadav^{1*}, Dr. Alka Yadav², Dr. Pooja Sharma³, Dr. Bhappil Sharma⁴

^{1,3}PG Scholar, Department of Prasuti Tantra Evum Stree Roga, VYDSAM, Khurja, U.P.

²PG Scholar, Department of Samhita and Siddhant Darshan, IMS BHU, Varanasi, U.P.

⁴Guide, Professor Department of Prasuti Tantra Evum Stree Roga, VYDSAM, Khurja, U.P.

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*Corresponding Author

Dr. Anju Yadav

PG Scholar, Department of
Prasuti Tantra Evum Stree
Roga, VYDSAM, Khurja,
U.P.

ABSTRACT

Introduction - Iron Deficiency Anemia (IDA) is the most common haematological disorder in pregnancy, affecting a significant proportion of women globally, especially in developing countries. It is a major cause of maternal and perinatal morbidity and mortality. In Ayurveda, this condition is closely correlated with *Garbhini Pandu*, a type of *Pandu Roga* specifically occurring during pregnancy. The classical texts provide a detailed understanding of its etiology, pathogenesis, and management principles that remain highly relevant.

Objective - This review aims to comprehensively analyze the concept of *Garbhini Pandu* from an Ayurvedic perspective, correlate it with modern understanding of IDA in pregnancy, and evaluate the integrative management strategies combining both paradigms.

Methods-A systematic literature search was conducted using databases

like PubMed, Scopus, DHARA, AYUSH Research Portal, and relevant Ayurvedic classical texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*. **Results** - The pathogenesis of *Garbhini Pandu* involves aggravation of *Vata* and *Pitta doshas*, leading to impairment of *Rasa Dhatu* and *Rakta Dhatu*, primarily due to the nutritional demands of the growing fetus (*Garbha*). Ayurvedic management emphasizes *Santarpanajana Chikitsa* (nourishing therapy) over *Apatarpana* (depleting therapy). It includes dietary modifications (*Ahara*) like iron-rich foods and pomegranate, lifestyle advisories (*Vihara*), and a plethora of herbal and herbo-mineral formulations. These interventions not only improve hematological parameters but also enhance digestion and absorption, addressing the root cause. Integrative

approaches, combining Ayurvedic supplements with modern iron prophylaxis, show promise in reducing side effects (like constipation) and improving compliance and efficacy.

Conclusion - The ancient Ayurvedic science offers a holistic, multi-targeted, and safe approach to managing *Garbhini Pandu*/IDA. An integrative model, combining the strengths of evidence-based modern medicine and the holistic principles of Ayurveda, can provide a superior framework for preventing and treating anemia in pregnancy, thereby improving maternal and child health outcomes.

KEYWORDS: *Garbhini Pandu*, Iron Deficiency Anemia, Pregnancy, *Punarnavadi Mandura*.

INTRODUCTION

Pregnancy is a state of profound physiological transformation aimed at nurturing the development of a new life. This period demands significant nutritional and metabolic adjustments from the maternal body.^[1] Among the various nutritional deficiencies that can occur, Iron Deficiency Anemia (IDA) stands out as the most ubiquitous, affecting an estimated 40% of pregnant women globally, with prevalence soaring as high as 60-80% in regions like South Asia and Africa.^[2] IDA in pregnancy is associated with dire consequences, including increased risks of maternal mortality, preterm birth, low birth weight, perinatal mortality, and poor cognitive development in the offspring.^[3]

The modern medical management primarily revolves around iron supplementation, typically in the form of ferrous salts (sulfate, fumarate, gluconate).^[4] While effective, this approach is often plagued by significant gastrointestinal side effects such as nausea, epigastric pain, constipation, and black stools, leading to poor patient compliance and suboptimal therapeutic outcomes.^[5] Furthermore, it represents a unidimensional approach focused solely on iron repletion, often overlooking the broader aspects of digestion, absorption, and holistic well-being.

Ayurveda, the ancient Indian system of medicine, describes a condition in pregnancy known as *Garbhini Pandu*.^[6] The term "*Garbhini*" means a pregnant woman and "*Pandu*" refers to a disease characterized by pallor of the skin.

सर्वेषु चैतेष्विह पाण्डुभावो यतोऽधिकोऽतः खलु पाण्डुरोगः॥ (सु. उ. 44/4)

The description of its etiology, symptoms, and complications bears a striking resemblance to modern IDA. However, the Ayurvedic perspective is holistic. It does not view anemia merely as a hemoglobin deficit but as a manifestation of a deeper imbalance in the *Agni* (digestive fire), *Doshas* (bio-energies), and *Dhatus* (bodily tissues), particularly *Rasa* (plasma) and *Rakta* (blood).^[7]

Therefore, this review article seeks to bridge the gap between these two systems of medicine. It will delve into the Ayurvedic concept of *Garbhini Pandu*, correlate it with the modern pathophysiology of IDA in pregnancy, and critically evaluate the management principles from both disciplines. The ultimate goal is to propose a pragmatic, evidence-informed integrative model that leverages the strengths of both Ayurveda and modern medicine to combat this pervasive public health challenge effectively.

MATERIALS AND METHODS:

This narrative review was conducted through an extensive analysis of both classical Ayurvedic literature and contemporary scientific research.

Source of Data collection

- Ayurvedic Classics: Primary sources included *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Kashyapa Samhita* and their major commentaries. Key chapters on *Pandu Roga* and *Garbhini Chikitsa* were scrutinized.
- Modern Medical Literature: Electronic databases such as PubMed, MEDLINE, Scopus, Google Scholar etc.
- AYUSH Portals: Databases like DHARA (Digital Helpline for Ayurveda Research Articles) and the AYUSH Research Portal were utilized to gather research on Ayurvedic interventions for anemia.
- Studies and texts describing the etiology, pathogenesis, clinical features, and management of Garbhini Pandu or IDA in pregnancy, including clinical trials, review articles, and case reports, were included.

AYURVEDIC PERSPECTIVE OF GARBHINI PANDU

Nidana (Etiological Factors)

Acharya Charaka and others Acharya's have described both general causes of *Pandu* and those specific to pregnancy.^[8] The causes can be categorized as follows:

Aharaja (Dietary):

- Excessive intake of Amatarpaniya (unwholesome/non-nourishing food).
- Excessive consumption of Kshara (alkaline substances), Amla (sour), Lavana (salty), and Katu (pungent) tastes.
- Viruddha Ahara (incompatible food combinations).
- Adhyashana (eating before the previous meal is digested).
- Ruksha (dry) and Sheeta (cold) diet.

Viharaaja (Lifestyle)

- Ativyayama (excessive physical exertion).
- Atiprajagara (excessive wakefulness).
- Vegavidharana (suppression of natural urges).

Manasika (Psychological)

- Excessive Chinta (worry), Shoka (grief), Bhaya (fear), Krodha (anger), stress.

Pregnancy-Specific:

- The inherent increased nutritional demand by the developing *Garbha* (fetus) is a key factor. If the mother's diet is inadequate to meet this dual demand, depletion of *Rasa Dhatu* occurs, leading to *Pandu*.^[9]

SAMPRAPTI (PATHOGENESIS)

The sequence of events leading to *Garbhini Pandu* is a complex interplay of *Doshas*, *Dhatus*, and *Agni*.^[10]

- **Provocation of *Doshas*:** The etiological factors, especially the *Pitta*-aggravating ones (sour, pungent foods, anger), primarily vitiate *Pitta Dosha*. *Vata* is also aggravated due to dryness, lightness, and exertion.
- **Impairment of *Agni*:** The vitiated *Doshas*, particularly *Pitta*, lodge in the *Kostha* (GI tract) and impair the *Jatharagni* (digestive fire) and *Dhatvagni* (tissue-level metabolism). This is a critical step, as impaired *Agni* is the root cause of improper assimilation of nutrients, including iron.
- **Vitiation of *Rasa and Rakta Dhatu*:** Impaired *Agni* leads to the formation of *Ama* (toxins) and prevents the proper formation of *Rasa Dhatu* from digested food. The vitiated *Pitta* and *Vata* then act upon this already weak *Rasa Dhatu*, contaminating and destroying it. Since *Rakta Dhatu* (blood) is the immediate successor of *Rasa Dhatu*, its production is also severely hampered.

- *Ama Utpatti* (Formation of Toxins): Impaired *Agni* leads to the formation of *Ama* (incompletely digested, toxic metabolites).
- **Manifestation of clinical features (*Rupa*):** The deficiency of healthy *Rasa* and *Rakta Dhatu* manifests as pallor (*Vaivarnya* - discoloration), weakness (*Daurbalya*), fatigue (*Shrama*), *Aruchi* (anorexia), Angamarda (body ache), breathlessness (*Shwasa*), and other classical symptoms of *Pandu*.^[11]

दोषाः पित्तप्रधानास्तु यस्य कृष्यन्ति धातुषु। शैथिल्यं तस्य धातूनां गौरवं चोपजायते ॥

ततो वर्णवलस्नेहा वे वान्वेऽप्योजसो गुणाः। व्रजन्ति श्रयमत्यर्थं दोषदृष्यप्रदूषणात् ॥

सोऽल्परक्तोऽल्पमेदस्को निःसारः शिथिलेन्द्रियः। वैवर्ण्यं भजते (च.चि.16/4-5)

MODERN MEDICAL PERSPECTIVE OF IDA IN PREGNANCY

Pathophysiology

During pregnancy, plasma volume increases by approximately 50%, while red cell mass increases by only 20-30%, leading to a physiological hemodilution and a fall in hemoglobin concentration—the so-called "physiological anemia of pregnancy."^[12] True IDA occurs when this dilution is compounded by an actual deficiency of iron stores. The demand for iron skyrockets to approximately 1000 mg per pregnancy to support the expansion of maternal red cell mass, the development of the placenta and fetus, and to compensate for blood loss during delivery.^[13] If dietary intake and pre-pregnancy stores are insufficient to meet this demand, IDA ensues.

Causes

- Increased Demand: Due to the needs of the fetus and placenta.
- Inadequate Intake: Poor dietary habits, vegetarian/vegan diets with less bioavailable iron.
- Impaired Absorption: Conditions like celiac disease, *Helicobacter pylori* infection, or increased pH due to proton pump inhibitor use.
- Blood Loss: From parasitic infections (e.g., hookworm), hemorrhoids, or other GI losses.

Complications

- As noted earlier, maternal risks include preterm labor, pre-eclampsia, postpartum hemorrhage, cardiac failure, and increased susceptibility to infections.

- Fetal risks include intrauterine growth restriction, prematurity, low birth weight, and impaired neurological development.

Correlation between *Garbhini Pandu* and IDA

A strong correlation exists between the two entities, as evidenced in the table below:

Aspect	<i>Garbhini Pandu</i> (Ayurveda)	Iron Deficiency Anemia (Modern)
Primary Cause	Doshika imbalance (Pitta-Vata), impaired Agni, inadequate Ahara	Imbalance between iron demand and supply, poor dietary intake
Key Pathophysiology	Impairment of Rasa and Rakta Dhatu formation	Deficiency of iron for heme synthesis, leading to microcytic hypochromic anemia
Cardinal Symptoms	Pandutva (pallor), Daurbalya (weakness), Shrama (fatigue), Hridrava (palpitations), Shwasa (breathlessness)	Pallor, fatigue, weakness, palpitations, shortness of breath
Complications	Garbhasrava (abortion), Prameha (gestational diabetes?), difficult labor, poor fetal development	Preterm birth, low birth weight, pre-eclampsia, perinatal mortality

MANAGEMENT

Principles of Ayurvedic Management (*Chikitsa Sutra*)

The management of *Garbhini Pandu* is tailored to the delicate state of pregnancy. The primary goal is *Brimhana* (nourishing) without causing *Srotorodha* (obstruction to channels). The strategy is multifaceted.^[14]

- *Nidana Parivarjana* (Avoidance of Causative Factors): The first and foremost step is to eliminate the known etiological factors from diet and lifestyle.
- *Agni Deepana* (Kindling Digestive Fire): Since *Agnimandya* is the root cause, initial therapy focuses on restoring digestion using mild *Deepana* (carminative) and *Pachana* (digestant) drugs like *Chitraka* (*Plumbago zeylanica*), *Shunthi* (*Zingiber officinale*), and *Pippali* (*Piper longum*). This ensures proper assimilation of subsequent therapies and food.
- *Ama Pachana* (Elimination of Toxins): If *Ama* is present, it must be cleared. In pregnancy, strong detoxification (*Shodhana*) is contraindicated. However, *Shakrita Virechana* (mild purgation using buttermilk medicated with digestive herbs) is specifically indicated in *Garbhini Pandu* to clear the channels without harming the fetus.^[15]
- *Santarjana* (Specific Dietetic Regimen): A post-digestive light diet is advised before starting nourishing therapy.

- *Brimhana Chikitsa* (Nourishing Therapy): This is the mainstay of treatment, using iron-rich herbs and minerals, along with a nourishing diet.

Ayurvedic Interventions

Ahara (Dietary Management)

Diet is considered the first and most important medicine. Specific Pathya (wholesome) foods are advised.^[16]

- *Dadima* (Pomegranate) - Considered the best fruit for nourishing *Rasa* and *Rakta Dhatu*.
- *Amalaki* (Indian Gooseberry) - A rich source of Vitamin C to enhance iron absorption and a potent *Rasayana*.
- *Guda* (Jaggery) - A traditional source of iron.
- *Mudga Yusha* (Green gram soup) - Easy to digest and nourishing.
- *Shali* Rice - Old rice is considered light for digestion.
- Milk and Medicated Milk - Processed with herbs like *Shatavari* (*Asparagus racemosus*) for deep nourishment.
- Leafy Vegetables - Such as *Punarnava* (*Boerhaavia diffusa*), *Mandukaparni* (*Centella asiatica*).

Vihara (Lifestyle Modifications)

Adequate Rest (*Samshrama*) - To prevent aggravation of *Vata* and conserve energy.

Avoidance of Stress - Mental peace is emphasized.

Anjana (Collyrium) - Application of *Sauviranjana* (antimony sulphide) is recommended to improve vision weakened by *Pandu*.^[17]

Aushadha (Pharmacotherapy)

This is the cornerstone of treatment, utilizing a wide array of herbal and herbo-mineral formulations.

Single Drugs (*Dravya*)

- *Punarnava* (*Boerhaavia diffusa*) - A key drug for *Pandu*, acts as a *Raktashodaka* (blood purifier) and *Mutrala* (diuretic), helping to reduce edema often associated with anemia.^[18]
- *Amalaki* (*Emblica officinalis*) - *Rasayana* and rich Vitamin C source.
- *Haridra* (*Curcuma longa*) - Helps in purification and formation of blood.
- *Musta* (*Cyperus rotundus*) - Aids digestion and manages associated nausea.

Compound Formulations (*Yoga*):

- *Punarnavadi Mandura* - The most celebrated formulation for Pandu. It contains *Punarnava*, *Triphala* (three myrobalans), *Trikatu* (three pungent herbs), and *Mandura Bhasma* (calcined iron oxide). It addresses the root cause by improving *Agni*, providing bioavailable iron, and acting as a mild diuretic. Multiple studies have shown its efficacy comparable to ferrous sulfate with better tolerability.^[19]
- *Navayasa Lauha* - A complex formulation containing *Lauha Bhasma* (iron ash) processed in *Amalaki* juice and decoctions of multiple herbs. It is a potent hematinic and rejuvenative.
- *Dhatri Lauha* - Contains *Lauha Bhasma* and *Amalaki*. Ideal for *Pitta*-predominant anemia, as it is cooling in nature.
- *Saptamrita Lauha* - Another effective iron-based preparation with seven ingredients.
- *Lohasava* - A fermentative preparation, which enhances absorption.
- *Mandura Vataka* - Tablets containing *Mandura Bhasma*.

The use of *Bhasmas* (calcined metals/minerals) like *Lauha Bhasma* and *Mandura Bhasma* is a unique strength of Ayurveda. Their *Bhasmikarana* process (purification, incineration) renders the iron particles nano-sized, which potentially enhances their bioavailability and reduces the oxidative stress and GI irritation associated with conventional iron salts.^[20]

DISCUSSION

The Ayurvedic approach to *Garbhini Pandu* is distinguished by its holistic and causative-level management. While modern medicine provides elemental iron, Ayurveda provides a "smart" delivery system:

- Addressing Digestion First - The initial use of *Deepana-Pachana* drugs is crucial. Without proper *Agni*, even the best iron supplement will not be absorbed optimally and may cause *Ama*.
- Polyherbal Synergy - Formulations like *Punarnavadi Mandura* are multi-targeted. *Trikatu* and *Musta* enhance digestion and gastric acid secretion, facilitating the reduction of ferric to absorbable ferrous iron. *Amalaki* provides Vitamin C. *Punarnava* helps manage fluid balance. *Mandura Bhasma* provides bioavailable iron.
- Holistic Nourishment - The therapy is not limited to raising hemoglobin. The *Brimhana* effect nourishes all *Dhatus*, improving overall strength, immunity, and well-being of the mother, which is vital for a healthy pregnancy outcome.

- Safety in Pregnancy - The therapies are designed considering the fragility of pregnancy. *Shakrita Virechana* is a classic example of a gentle cleansing procedure deemed safe for gestation.

Clinical evidence, though requiring larger trials, supports the efficacy of these interventions. Studies on *Punarnavadi Mandura* have shown significant increases in Hb%, RBC count, and serum iron levels, with a notable absence of the constipation and gastritis commonly seen with ferrous sulfate.^[21]

CONCLUSION AND FUTURE DIRECTIONS

Garbhini Pandu, the Ayurvedic embodiment of anemia in pregnancy, is managed by a profound scientific protocol that corrects the underlying metabolic dysfunction (*Agnimandya*) to ensure efficient iron absorption and utilization. The pharmacopeia, rich in herbs and processed minerals, offers effective and well-tolerated alternatives to conventional iron therapy.

Integrating this holistic paradigm into modern antenatal care holds immense promise. An integrative model could involve:

- Using Ayurvedic Deepana drugs to improve digestion and appetite in pregnant women.
- Employing formulations like *Punarnavadi Mandura* as a first-line therapy in mild-moderate cases or as an adjunct to reduce the dose and side effects of allopathic iron in severe cases.
- Implementing Ayurvedic dietary and lifestyle guidelines as a preventive strategy for all pregnant women.

Future research should focus on:

- Large-scale, robust Randomized Controlled Trials (RCTs) comparing standalone and integrative Ayurvedic protocols with standard care.
- Pharmacological studies to understand the bioavailability and mechanism of action of Lauha and Mandura Bhasma.
- Standardization of Ayurvedic formulations for global use.
- Developing interdisciplinary clinical practice guidelines for the integrative management of anemia in pregnancy.

By embracing the wisdom of Ayurveda, we can move towards a more effective, tolerable, and holistic solution to the global challenge of Iron Deficiency Anemia in pregnancy.

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