

Intrauterine Growth Restriction in Ayurveda: A Review of Classical Concepts and Contemporary Approaches

Vrushali Hake¹, Preetham Pai^{2*}

¹MD Resident, III Year, Department of Kaumarbhritya-Balaroga, College of Ayurved & Hospital, Bharati Vidyapeeth (Deemed to be University), Pune, Maharashtra, India

^{2*}Guide and Professor, Department of Kaumarbhritya-Balaroga, College of Ayurved & Hospital, Bharati Vidyapeeth (Deemed to be University), Pune, Maharashtra, India

***Corresponding Author; Dr. PREETHAM PAI**

*Guide and Professor, Department of Kaumarbhritya-Balaroga, College of Ayurved & Hospital, Bharati Vidyapeeth (Deemed to be University), Pune, Maharashtra, India

Abstract:

Background: Intrauterine Growth Restriction (IUGR) is a significant cause of neonatal morbidity and mortality, affecting 5–10% of pregnancies. It results from an inability of the fetus to achieve its genetically predetermined growth potential. Modern medicine attributes IUGR to maternal, fetal, and placental factors, while Ayurvedic literature identifies analogous conditions such as Garbhashosha, Upavishtaka, and Nagodara under Garbhavyapada. These correlations provide a basis for integrating traditional knowledge with modern diagnostics.

Objectives: To provide a detailed review of IUGR from both Ayurvedic and modern perspectives, To explore Ayurvedic correlates like Garbhashosha, Upavishtaka, Nagodara and their etiopathogenesis. To identify Ayurvedic and contemporary diagnostic markers and management strategies for IUGR.

Methods: Review included 27 peer-reviewed articles (11 Ayurvedic, 16 contemporary); five Ayurvedic and eight contemporary studies provided strongest evidence. A literature review was conducted using PubMed, Google Scholar, ScienceDirect, and classical Ayurvedic texts (Charaka Samhita, Sushruta Samhita, Kashyapa Samhita, Ashtanga Hridaya). Keywords included IUGR, Upavishtaka, Garbhashosha, Nagodara, Ayurveda. Peer-reviewed articles, clinical studies, and authentic translations were included. Non-peer-reviewed and irrelevant works were excluded. Ayurvedic descriptions of Garbhashosha, Upavishtaka, and related conditions were compared with modern definitions, pathogenesis, symptoms, and treatments to develop an integrative perspective.

Results: The review encompassed 27 peer-reviewed articles, including 11 Ayurvedic and 16 contemporary studies. Among these, five Ayurvedic and eight contemporary investigations provided the most robust evidence. Classical Ayurvedic descriptions of conditions analogous to IUGR closely corresponded with modern diagnostic criteria. Integrative management approaches demonstrated improvements in birth weight, maternal hemoglobin levels, and overall maternal-fetal wellbeing. These promising findings highlight the need for large-scale randomized controlled trials to validate the efficacy and safety of Ayurvedic interventions in IUGR management.

Conclusion: Ayurvedic care for IUGR, including Kshirbasti, Rasayana therapy, and dietary interventions, complements modern antenatal practice. Integrative approaches have potential to improve perinatal outcomes, but robust clinical trials are required before widespread adoption.

Keywords: IUGR, Upavishtaka, Garbhashosha, Nagodara, Ayurveda

How to cite this article: Hake V, Pai P. Intrauterine Growth Restriction in Ayurveda: A Review of Classical Concepts and Contemporary Approaches. *Int J Drug Deliv Technol.* 2026;16(25s): 448-452. DOI: 10.25258/ijddt.16.25s.56

Highlights:

- Ayurveda offers conceptual parallels to IUGR through Garbhavyapada entities such as Garbhashosha and Upavishtaka.
- Integrative approaches combining Ayurvedic and modern obstetrics may improve fetal growth outcomes.
- Kshirbasti and Rasayana therapies demonstrate potential in enhancing maternal-fetal nutrition.
- Current evidence is limited by methodological heterogeneity and small sample sizes.
- Future large-scale randomized controlled trials are essential for validation.

However, most studies were limited by small sample sizes, heterogeneity, and inadequate blinding.

INTRODUCTION:

Intrauterine Growth Restriction (IUGR) is a severe

obstetric complication, which can afflict an estimated 5–10 percent of all pregnancies around the globe, and may cause perinatal morbidity and mortality as well as long-term sequelae in survivors [1,2]. In contemporary obstetrics, IUGR is a failure to realize its genetically determined growth potential in the fetus, which is most often determined in case the estimated fetal weight is below the 10th percentile of gestational age [3]. The disorder is linked to high risks of stillbirth and neonatal intensive care hospitalization, as well as adulthood chronic conditions, such as metabolic syndrome and cardiovascular disease [4]. Mixed aetiology has been observed to be caused by placental dysfunction, maternal under nutrition, chronic systemic disease, intrauterine infections, and chromosomal or genetic anomalies [5].

The Ayurveda or Indian traditional medical system offers a comprehensive guideline on maternal health during pregnancy and fetal well being. Classical

*Author for Correspondence: Preetham Pai

literature

outlines some Garbhavyapada (Antenatal complications), which is a close analogy with the contemporary concept of IUGR. One of them is Garbhasosha (Fetal malnutrition) or

Vatabhipanna Garbha, which is defined by insufficient intrauterine nutrition and limited fetal growth [6,7]. Such connected disorders as Upavishtaka (Severe IUGR / Fetal growth arrest) and Nagodar (Oligohydramnios) are also reported, Vata dosha (bioelectric-motility regulator of the body) is the most common pathologic factor [8].

Other etiological factors are inappropriate diet of the mother (Ahara), maladaptive lifestyle habits (Vihara) and obstruction of nutrient supply to the fetus by disruption of nutrient flow through vitiation of the Rasa and Rakta dhatus [9].

Management of such conditions according to Ayurvedic principles focuses on the best maternal nutrition, dosha, and the growth of the fetus due to specific interventions. Kshirbasti (enema therapy with milk made medicinal) is regarded to be especially good in pacifying dosha Vata and in enhancing intrauterine nourishment. The classical indications of formulations like Shatavari (*Asparagus racemosus* Willd) Kshirbasti, Yashtimadhu (*Glycyrrhiza glabra* L.), Siddha Kshirbasti, Ashwagandha (*Withania somnifera* (L.) Dunal) Phalaghrita Kshirbasti and Bruhaniya Gana Siddha Kshirbasti include stimulation of fetal growth [10,11]. Also the Rasayana treatment (Rejuvenative and adaptogenic treatment), Pumsavana karma (Ayurvedic prenatal treatment towards optimum fetal growth and health) and nourishing (Bruhaniya) diets are all advised both preventive and curative treatments [12]. There is emerging clinical evidence that combining such Ayurvedic-based protocols with contemporary antepartum care can enhance maternal health, birth weight, and neonatal outcomes [13]. In the context where traditional treatment is limited, a hybrid approach, the modern diagnostic and monitoring methods alongside the Ayurvedic treatment based on evidence-based methods of treatment, can be more effective as the overall approach to the IUGR treatment.

The current review will discuss Ayurvedic approach to the possibility of IUGR by comparing classical notions like Garbhashosha, Upavishtaka, and Nagodar with modern biomedical insights amid presenting a critical analysis of the evidence on the research of intervention like Kshirbasti and Rasayana therapy as means of enhancing fetal development and birth rates.

MATERIALS AND METHODS

The methodology that was used was a narrative review to conduct a thorough analysis of the Ayurvedic and contemporary literature on Intrauterine Growth Restriction (IUGR) and fetal growth restriction (FGR). A total of 27 peer-reviewed articles, which included 11 Ayurvedic and 16 contemporary studies, were included in the review. Out of these, five Ayurvedic and eight modern researches were found to give the best evidence on the basis of study

design and refinements.

Classical texts like the Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya and Kashyapa Samhita were considered to be the main Ayurvedic sources. The secondary sources were located by systematic identification of electronic databases such as PubMed, Google Scholar, and ScienceDirect.

The inclusion criteria were as below:

Articles written in English or Sanskrit including English translation,

- Peer-reviewed journal articles that cover the topics of IUGR, FGR, and Ayurvedic maternal- fetal care.

- Clinical trials, observational, and review articles.

The exclusion criteria were:

- Non-peer-reviewed articles,
- Research that is not directly related to the parameters of pregnancy or fetal growth.

Thematically coded data extraction and synthesis was carried out as classical Ayurvedic knowledge, etiopathogenesis, Ayurvedic management of the condition, modern medical associations, and integrative methods. It was a systematic method that allowed the systematic and interdisciplinary analysis of the topic.

RESULT

A total of 27 peer-reviewed articles were reviewed, 11 of Ayurvedic and 16 contemporary studies. Out of them, five Ayurvedic and eight modern studies gave the strongest evidence. Therefore they were chosen in the review.

1. Conventional Ayurvedic Insight.

Underdeveloped fetus According to Ayurveda, fetal abnormality corresponds to Garbhashosha, Upavishtaka and Nagodar, which are known as Garbha-vyapad in Ayurvedic classics. Garbhasana is mentioned in Charaka Samhita (Sharirsthana8/20) as a state where the fetus is malnourished by loss of Rasa dhatu and increase of Vata dosha, which results in stunted growth, emaciation of the fetus [14]. Garbhasosha is another name on the list of fetal ailments caused by maternal debility and poor nutrition as given in Kashyapa Samhita (Khila Sthana 4/6) [15].

In Sushruta Samhita (Sharira Sthana 10/43), Upavishtaka is said to be delayed fetal growth and extended gestation usually due to lack of sufficient uteroplacental sustenance [16].

Nagodar is also identified by abnormal growth of the fetus including excessive or insufficient amniotic fluid and distension of the abdomen of the mother [17]. The underlying pathology of these entities is similar, that is, they are impaired in nutrient transfer by a common cause known as rasavaha srotas, insufficient poshaka rasa, and Vata preeminence. Classical literature stresses that healthy development of fetus needs maternal diet, rest and emotional stability.

1. Etiopathogenesis (Nidana, Samprapti)

Ayurvedic nidra (etiological factors) in suppressed fetal

growth are:

- Maternal malnutrition (Alpa ahara sevana) and chronic diseases (Jirna vyadhi) [18]. - Incompatible combinations of diet (viruddha aha) that undermine the absorption of nutrients [19].
 - Overexertion and stress (Ati vyayama, Manasika vyapad), ailing Vata [20].
 - Trying to repress the natural urges (Vegavarodha), disrupting the physiological homeostasis [21].
- The pathogenesis (samprapti) begins with the aggravation of Vata that interferes with rasa- rakta dhatu poshana, and the distortion of upasneha (nutritive flow) to the fetus [22]. This results in the waste (dhatu kshaya) of Rasa and Rakta which causes an arrested growth of the fetus.

2. Ayurvedic Management Protocols

Management is meant to rectify doshic imbalance, enhance maternal food and maximize fetal food.

a. Kshirbasti (Lotion of milk Enema)

Applied in pacifying vata and in nourishing maternal-fetal tissues. Formulations include: -

Shatavari Kshirbasti (*Asparagus racemosus*): enhances lactogenic activity and anabolic metabolism [23].

- Yashtimadhu Siddha Kshirbasti (*Glycyrrhiza glabra*): helps to regenerate tissue and maintain a good level of hormones [24].

- Aashwagandha Phalaghruta Kshirbasti (*Withania somnifera*): helps to increase muscular strength and immune resilience [25].

- Bruhaniya Gana Siddha Kshirbasti: same whereby using the herbs of the Bruhaniya group described in Charaka Samhita (Sutrasthana 4/9) is used to promote tissue growth .

a. Rasayana Therapy

Herbs such as Amalaki (*Emblica officinalis*), Guduchi (*Tinospora cordifolia*), and Pippali (*Piper longum*) are administered to boost maternal vitality, antioxidant status, and fetal immunity [26,27].

b. Pumsavana Karma

A preventive antenatal regimen to ensure healthy progeny, typically performed before the fourth month of pregnancy using herbal decoctions or nasal applications [28].

c. Bruhaniya Ahara-Vihara

Nutrient-rich diets—milk, ghee, dates, wheat, mung bean—and lifestyle modifications focusing on rest, emotional balance, and avoidance of overexertion are emphasized [18].

Modern Medical Understanding of IUGR

Contemporary obstetrics defines IUGR as fetal weight below the 10th percentile for gestational age, confirmed by serial ultrasonography. The condition may result from uteroplacental insufficiency, maternal malnutrition, chronic diseases (hypertension, anemia, renal disorders), or adverse lifestyle factors such as smoking and alcohol consumption [2].

Pathophysiologically, IUGR reflects a chronic hypoxic state leading to asymmetric or symmetric

growth restriction. Management relies on maternal nutritional optimization, treatment of underlying conditions, and close fetal surveillance via Doppler velocimetry, biophysical profile, and non-stress testing [29].

Management principles in modern perinatology aim to optimize intrauterine conditions and minimize perinatal morbidity and mortality:

1. Maternal nutritional optimization – A high-protein, caloric-dense diet supplemented with micronutrients such as iron, folic acid, calcium, and omega-3 fatty acids is recommended. Nutritional counseling focuses on culturally appropriate, affordable, and palatable meal plans.
2. Treatment of underlying maternal conditions – This includes tight control of hypertension, correction of anemia, and management of chronic systemic illnesses to improve uteroplacental perfusion.
3. Close fetal surveillance – Growth-restricted pregnancies require enhanced fetal monitoring, employing:
 - o Doppler velocimetry of the umbilical artery and middle cerebral artery to assess blood flow patterns.

o Biophysical profile (BPP) to evaluate fetal well-being. o Non-stress testing (NST) to detect early signs of fetal compromise.

The timing of delivery is a critical component of management. Decisions are based on gestational age, severity of growth restriction, fetal well-being parameters, and maternal status. Early delivery may be indicated in cases of worsening Doppler findings or evidence of fetal distress despite prematurity risks.

Thus, modern medical protocols parallel the Ayurvedic emphasis on maternal health optimization and early detection of fetal compromise, albeit using advanced diagnostic and monitoring modalities.

Integrative Approaches and Evidence

Emerging clinical evidence supports the integration of Ayurvedic interventions with modern antenatal care to improve outcomes in IUGR. Studies on Rasayana herbs, dietary counseling aligned with *Bruhaniya ahara*, and prenatal procedures such as *Pumsavana karma* have demonstrated improvements in birth weight, placental function, and maternal well-being without adverse effects [27,28,30]. Such integrative protocols align with WHO recommendations for culturally contextualized maternal care and could provide a sustainable model in low-resource settings.

Evidence from Clinical Studies

- AYUSH clinical trials report improved birth weight with *Kshirbasti* and Rasayana in IUGR cases [31].
- Modern studies confirm nutritional and hemodynamic benefits of these interventions [32].

DISCUSSION

The Ayurvedic paradigm provides a comprehensive and holistic framework for the management of Intrauterine Growth Restriction (IUGR), emphasizing

both preventive and therapeutic modalities. Central to this approach is the optimization of maternal health, enhancement of digestive fire (Agni), and promotion of fetal nourishment, collectively aimed at restoring physiological balance and facilitating optimal fetal growth. In contrast, contemporary obstetrics primarily focuses on diagnostic precision and perinatal care, often limited to nutritional supplementation and delivery planning, with fewer strategies directed towards long-term prevention.

Integration of Ayurvedic interventions has the potential to:

- Enhance intrauterine nutrition,
- Support placental function,
- Improve fetal growth outcomes, and
- Mitigate complications, particularly in resource-constrained settings.

However, challenges persist regarding the standardization of herbal formulations, dosage regimens, and treatment protocols. Furthermore, there is a critical need for rigorously designed randomized controlled trials to substantiate the efficacy and safety profiles of these interventions.

The existing literature has randomized controlled trials, case series, and observational studies on Ayurvedic and contemporary literature. Populations in which the study was carried out were also found to be variable in terms of gestational age and maternal risk factors. In cases where quantitative results were provided, they showed statistically significant positive changes in birth weights, maternal hemoglobin levels, and the nutritional indices. There were safety evaluations that showed that there were few negative side effects of Ayurvedic therapies. It is interesting to note that the Ayurvedic classical assessment parameters were found to have diagnostic correlations to the present day ultrasound/Doppler results.

The limitation of the current literature is that the study sizes of the studies are small, they are not blinded and have methodological heterogeneity which limits the applicability of the results to the general population. The research needs to be taken forward in the future by focusing on standardizing the protocols of integrative management and pharmacological analysis of important Ayurvedic preparations to enhance the evidence-based practice in this area.

CONCLUSION

IUGR has its Ayurvedic treatment which includes its kshirbasti, rasayana therapy and dietary interventions which supplements the modern antenatal practice. Integrative methods can affect perinatal outcomes positively but strong clinical trials need to be completed before being adopted by many.

References

1. Lee AC, Katz J, Blencowe H, Cousens S, Kozuki N, Vogel JP, et al. National and regional estimates of term and preterm babies born small for gestational age in 138 low- and middle-income countries in 2010. *Lancet Glob Health*.

- 2013;1(1):e26–36.
2. Sharma D, Shastri S, Sharma P. Intrauterine growth restriction: antenatal and postnatal aspects. *Clin Med Insights Pediatr*. 2016;10:67–83. doi:10.4137/CMPed.S40070.
3. Figueras F, Gratacós E. Update on the diagnosis and classification of fetal growth restriction and proposal of a stage-based management protocol. *Fetal Diagn Ther*. 2014;36(2):86–98. doi:10.1159/000357592.
4. Barker DJ. The developmental origins of adult disease. *J Am Coll Nutr*. 2004;23(6 Suppl):588S–595S. doi:10.1080/07315724.2004.10719428.
5. Resnik R. Intrauterine growth restriction. *Obstet Gynecol*. 2002;99(3):490–6. doi:10.1016/S0029-7844(01)01780-9.
6. Sushruta. *Sushruta Samhita*. 5th ed. Delhi: Motilal Banarasidas; 1975. Sharira Sthana 10/62.
7. Charaka. *Charaka Samhita*. 19th ed. Varanasi: Chaukhamba Bharati Academy; 1993. Sharira Sthana 8/20.
8. *Ashtanga Sangraha*. Kolkata: Baidyanath Ayurveda Bhavan; 1989. Sharira Sthana 2/37.
9. Kashyapa. *Kashyapa Samhita (Vridhajivaka)*, Sharirsthana. Varanasi: Chaukhamba Sanskrit Sansthan; 2008.
10. Tripathi B. *Charaka Samhita, Chikitsa Sthana (Bruhaniya Varga)*. Varanasi: Chaukhamba Surbharati; 2010.
11. Vagbhata. *Ashtanga Hridaya, Sutra Sthana*. Varanasi: Chaukhamba Orientalia; 2014.
12. Sharma PV. *Dravyaguna Vijnana*. Vol. 2. Varanasi: Chaukhamba Bharati Academy; 2005.
13. Tiwari P, Dwivedi S, Bhattacharya S. Clinical evaluation of Kshirbasti in the management of low birth weight and intrauterine growth restriction. *AYU*. 2012;33(3):423–7.
14. Acharya YT, editor. *Charaka Samhita of Agnivesha*, Sharirsthana. Varanasi: Chaukhamba Sanskrit Sansthan; 2019.
15. Sharma PV, editor. *Kashyapa Samhita (Khila Sthana)*. Varanasi: Chaukhamba Vishvabharati; 2018.
16. Murthy KRS, editor. *Sushruta Samhita*. Varanasi: Chaukhamba Orientalia; 2017.
17. Tripathi B, editor. *Ashtanga Hridaya of Vagbhata*. Delhi: Chaukhamba Sanskrit Pratishthan; 2016.
18. Tiwari PV. *Ayurvediya Prasuti Tantra evam Stri Roga*. Varanasi: Chaukhamba Orientalia; 2015.
19. Sharma R, Dash B. *Charaka Samhita: Text with English translation*. Varanasi: Chaukhamba; 2014.
20. Lad V. *Textbook of Ayurveda*. Vol. 2. Albuquerque: Ayurvedic Press; 2006.
21. Dwivedi RR. Maternal lifestyle factors and fetal growth: an Ayurvedic perspective. *AYU*. 2012;33(3):331–6.
22. Bhatted SK, Sharma R. Role of Vata dosha in intrauterine growth restriction. *Anc Sci Life*. 2010;30(1):14–18.
23. Singh M, et al. Shatavari in pregnancy: clinical evaluation. *J Res Ayurveda Siddha*.

- 2014;35(2):45–51.
24. Patel K, et al. Effect of Yashtimadhu on hormonal profile in antenatal care. *AYU*. 2016;37(4):234–40.
 25. Kulkarni R, et al. Withania somnifera in obstetric health. *J Ethnopharmacol*. 2018;226:82–90. doi:10.1016/j.jep.2018.07.032.
 26. Thatte UM, Rege NN. Clinical applications of rasayana drugs in obstetrics. *Indian J Tradit Knowl*. 2005;4(3):226–32.
 27. Pandey S, Patwardhan B, Khanna R. Antioxidant potential of Amalaki and Guduchi in pregnancy. *AYU*. 2011;32(4):536–40.
 28. Sreekumar S. Pumsavana karma: Ayurvedic prenatal care and its clinical relevance. *Anc Sci Life*. 2013;32(4):228–33.
 29. Lees CC, Stampalija T, Baschat A, da Silva Costa F, Ferrazzi E, Figueras F, et al. ISUOG practice guidelines: diagnosis and management of small-for-gestationalage fetus and fetal growth restriction. *Ultrasound Obstet Gynecol*. 2020;56(2):298–312. doi:10.1002/uog.22134.
 30. World Health Organization. *WHO recommendations on antenatal care for a positive pregnancy experience*. Geneva: WHO; 2016.
 31. Ministry of AYUSH. *Clinical evaluation of Kshirbasti and Rasayana therapy in intrauterine growth restriction: multicentric trial report*. New Delhi: Ministry of AYUSH; 2020.
 32. Sharma P, et al. Impact of integrative antenatal care on fetal growth and maternal outcomes: a randomized controlled study. *J Obstet Gynaecol India*. 2021;71(2):150–7. doi:10.1007/s13224-020-01385-5.