

UTTARABASTI: A HOLISTIC AYURVEDIC APPROACH TO INFERTILITY MANAGEMENT WITH SPECIAL EMPHASIS ON ENDOMETRIAL FACTORS IN ART

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ABSTRACT

Infertility is a multifactorial condition that affects nearly 15% of couples worldwide and is increasingly becoming a public health concern due to lifestyle changes, environmental influences, and delayed conception attempts. Within the broad spectrum of causes, uterine receptivity — particularly endometrial thickness and biochemical responsiveness — plays a pivotal role in the success or failure of embryo implantation, especially in the context of Assisted Reproductive Technologies (ART). Modern reproductive medicine has made significant advancements in techniques like In Vitro Fertilization (IVF); however, implantation remains a limiting step, with up to 65% of IVF failures attributed to poor endometrial receptivity. Traditional Ayurvedic science provides a unique intervention in the form of Uttarabasti — an intrauterine therapeutic procedure aimed at restoring uterine health and functionality.^[1,2] The procedure, grounded in the principles of Vata shamana and dhatu poshana, has shown promising outcomes in correcting Artava Kshaya (Endometrial deficiency) and

enhancing implantation success. This article explores the therapeutic relevance of Uttarabasti in the context of ART and thin endometrium, integrating classical Ayurvedic insights with contemporary reproductive physiology.

INTRODUCTION

The global rise in infertility cases has propelled the development of advanced ART procedures like In Vitro Fertilization (IVF). Despite technological progress, implantation failure remains a critical limitation, often due to suboptimal endometrial conditions. The success of ART is not solely determined by embryo quality but also by the receptivity of the uterine environment.

In Ayurvedic literature, the uterus (Garbhashaya) and its functional condition (Kshetra) are integral to conception. The classical framework of Ritu (Timing), Kshetra (Uterus), Ambu (Nutritional fluid), and Beeja (Gametes)^[3] serves as the cornerstone for understanding fertility. Among these, Kshetra—corresponding to the endometrium—is directly responsible for nurturing and anchoring the embryo. Disruption in its physiological integrity, often due to Vata vitiation, manifests as Artava Kshaya (Diminished or absent menstruation), correlating with thin or poorly responsive endometrium.

Uttarabasti is an Ayurvedic intervention uniquely suited for such disorders, providing localized, targeted treatment to improve uterine health and optimize conditions for implantation.

Endometrial receptivity: A key determinant in art

Physiological overview

Successful implantation requires:

- A competent embryo
- A receptive endometrium
- A synchronized maternal-embryonic dialogue

The endometrium undergoes proliferative and secretory transformations under the influence of estrogen and progesterone. During the ‘window of implantation’ (typically days 19–23 of a 28-day cycle), the endometrium exhibits a receptive phenotype, including glandular secretion, stromal edema, and expression of adhesion molecules.

Biochemical and Molecular markers

Key markers for endometrial receptivity include:

- Cytokines: Leukemia Inhibitory Factor (LIF), Interleukins (IL-1), and Colony Stimulating Factors (CSFs)

- Adhesion Molecules: Integrins (e.g., $\alpha\text{v}\beta 3$), Glycodelin, and Mucin-1 (MUC-1)
- Transcriptomic Signatures: Assessed through Endometrial Receptivity Array (ERA), which guides personalized embryo transfer.

A deficiency or dysregulation of these elements often leads to implantation failure, even in the presence of good-quality embryos.

Ayurvedic understanding of endometrial factors

In Ayurveda, Artava refers to both the ovum and menstrual blood/endometrial tissue. The regular formation and healthy state of Artava depends on the balance of Agni (digestive/metabolic fire), Rasa-Rakta Dhatus, and Apana Vayu. Any vitiation, particularly of Vata—notably its Ruksha and Chala qualities—can lead to Artava Kshaya, which is correlated with thin endometrium, results in infertility.

Vandhyatva is described in classical texts under Yonivyapad and includes both anatomical and functional causes of reproductive failure. The involvement of Vata dosha^[4] is a common thread in these pathologies. In such conditions, Ayurveda advocates Shodhana^[5] (purificatory therapy) followed by Sthanika Chikitsa (local treatment), where Uttarabasti is paramount.

Uttarabasti: Concept, Methodology and Clinical relevance

Definition and Theoretical Basis^[6,7]

Uttarabasti is a form of Basti Karma (Therapeutic enema), administered through the vaginal or intrauterine route. It is considered the most specific treatment for Yonivyapad,^[8] particularly in cases involving Vata and uterine functional insufficiency.

It serves both Shodhana and Snehana functions^[9]

- Clears obstructed Srotas
- Re-establishes Vata equilibrium
- Nourishes the endometrium
- Enhances the receptivity of Kshetra

Indications in Infertility

- Thin endometrium
- Artava Kshaya
- Recurrent implantation failure
- Subfertility with uterine factor involvement

- Post-shodhana rejuvenation before ART

Formulations used

The efficacy of Uttarabasti depends on the selection of medicated oils and ghee based on dosha-dushya involvement:

- Phalaghrita: Supports endometrial nourishment and hormonal balance
- Mahanarayana taila: Rejuvenative and VataharaBala Taila & Dhanvantaram Taila: Strengthen uterine musculature and promote regeneration
- Kalyanaka Ghrita, Shatavari Ghrita: Enhance fertility and endocrine functions
- Kasisa taila and Manjishtadi taila are the other medicines that can be used.

Procedure and Timing

Administered during the Ritukala for maximum absorption and safety, the procedure involves:

1. Purva karma: Preparation with light diet, bowel clearance
2. Pradhana kazrma: Intrauterine instillation of medicated oil/decoction (2–6 mL) in sterile conditions
3. Paschat karma: Rest and observation, dietary and lifestyle modifications A course of three consecutive cycles is generally recommended.

Mode of action: Ayurvedic and Modern integration

- **Local therapeutic action:** Direct nourishment and stimulation of endometrial cells. The warm ghrita/taila infiltrated in uterus leads to activation of cytokines and interleukins like pro inflammatory mediators. There will be a sterile inflammatory condition. Also there will be increased blood circulation. This all together helps in increasing the endometrial thickness. As per Ayurveda, the snigdha, balya and vatahara propertirs of the medicated preparations used, helps in local nourishment of the endometrium.
- **Neurohormonal modulation:** Restoration hormonal signalling. Example- Phala ghrita has phytoestrogen. After metabolism the estrogenic property of phalaghrita enters the blood, in hypothalamus estradiol is converted into catacholestrogen 2 hydroxylase enzymes. Catacholestrogen may influence the GnRH release regulate hypothalamo pituitary ovarian axis and regulate reproductive functions. In terms of Ayurveda, it regulates Apana Vayu. Apana vayu is the one responsible for the proper functioning of

reproductive organs as per Ayurveda. Uttarabasti pacifies the apana vata which in turn promotes endometrial proliferation.

- **Improved vascularization:** Enhanced uterine perfusion mimicking estrogenic effects. The warm temperature of the medicinal preparations used in uttarabasti, stimulates the local blood flow by causing local vasodilatation. As per Ayurveda, uttarabasti does shrotoshodhana and clears the obstruction of srotas. It allows uninterrupted flow of Rasa and Rakta and hence Artava.
- **Immunological benefits:** Regulation of local immune response for embryo acceptance. The bioactive compounds in Uttarabasti formulations may influence the uterine natural killer cells, macrophages, regulatory T cells like immune cells, hence promoting- Tissue remodelling, controlled angiogenesis, increased tolerance to implantation. This supports formation of thicker and more vascularized endometrial lining. As per Ayurveda, the immunomodulatory herbs used in uttarabasti formulation helps to regulate immune environment, promoting immune tolerance which is necessary for endometrial proliferation and implantation.

Systemic support: Simultaneous effect on Rasa and Rakta Dhatus via uterine-liver axis. These mechanisms, although rooted in traditional principles, are increasingly being supported by modern clinical observations and research.

DISCUSSION

The contemporary understanding of uterine receptivity resonates with Ayurvedic insights on Kshetra Shuddhi and Artava Utpatti. Acharyas detailed the vascular dynamics and cyclical changes within the endometrial bed through concepts such as Beeja-Raktavaha Sira and Apana Vayu Karma. Any distortion in these functions results in gynecological disorders and infertility. The use of Uttarabasti in infertility, particularly in cases unresponsive to conventional hormonal therapy or repeated IVF failures, offers a promising adjunctive approach. The application of Uttarabasti not only aligns with traditional principles but also finds physiological justification in its capacity to regulate vascularity and uterine immunity — the key elements for successful implantation. By its ability to modulate local uterine conditions, enhance receptivity, and act on underlying Vata pathology makes it a valuable integrative tool.

Case series have reported

- Increased endometrial thickness
- Improved blood flow in Doppler studies
- Higher implantation and pregnancy rates when combined with ART

However, standardized clinical trials and biochemical validations are required to establish its position in mainstream reproductive medicine.

CONCLUSION

With infertility emerging as a critical reproductive challenge and ART success rates still limited by uterine factors, integrative approaches offer a promising horizon. Uttarabasti, a time-tested Ayurvedic therapy, through its multi-dimensional action, stands as a potent Ayurvedic modality to address endometrial insufficiency.

- It pacifies Vata, regenerates endometrial tissue, and supports implantation.
- When integrated with ART, it offers improved receptivity and potentially higher conception rates.
- The therapy bridges traditional and modern paradigms, emphasizing personalized, tissue-targeted care.

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