Indian J. Applied & Pure Bio. Vol. 41(2), 996-1005 (2026). **ISSN: 0970-2091**

The Gut-Vagina Axis in Ayurveda: An Integrative Review on Agni, Ama, and the Pathogenesis of Vaginal Dysbiosis

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Abstract

Vaginal health is a critical determinant of a woman's quality of life and reproductive success. While modern medicine identifies vaginal dysbiosis as a depletion of protective *Lactobacillus* species, this condition remains a significant public health challenge, with prevalence rates for abnormal discharge reaching up to 73%. This review bridges contemporary microbiome science with the *Ayurvedic* framework of *Yonivyapada* to propose a more sustainable management strategy. In *Ayurveda*, dysbiosis is understood as a localized manifestation of *Agni* (metabolic fire) imbalance and *Ama* (toxic accumulation), which creates a pathological soil for infection. While standard treatments rely on targeted antimicrobials, the *Ayurvedic* approach emphasizes *Sthanika Chikitsa* (local therapies) to restore the acidic *Agneya* environment and mucosal integrity. By integrating metabolic stability with modern diagnostic tools like Nugent scoring, practitioners can address the root causes of recurrence and antimicrobial resistance. Ultimately, this integrative model offers a holistic alternative for restoring the vaginal ecosystem across all life stages.

Key words : *Agni, Ama,* Pathogenesid, Vaginal Dysbiosis, Gut vagina axis.

The World Health Organisation defines health as a condition of whole physical, mental, and social well-being, not only the absence of illness or disability.[7] It is not possible to underestimate the significance of good health as it is the foundation of one's dignity

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and permits full participation in social, economic, and political domains. Women serve as the fundamental architects of the family, carrying the unique responsibility of nurturing future generations. Consequently, the health issues of women are not merely individual concerns but are the essential foundations for the prosperity and collective vitality of the entire global community. For women, strong reproductive health is a promise of a healthy family, since it is necessary for safe conception, healthy pregnancies, and the avoidance of infertility or chronic inflammatory diseases.

The human body is host to a diverse community of trillions of commensal bacteria, collectively known as the Body Microbiome, which maintain a symbiotic relationship with the host.[18] These microbes are necessary to life because they produce vital vitamins like vitamin K and vitamin B12, aid in digestion by breaking down complex carbs, and offer colonisation resistance by outcompeting pathogenic organisms for resources and space.[22] Additionally, starting in infancy, the microbiome is crucial in educating the immune system to differentiate between dangerous pathogens and innocuous substances.[19]

These microorganisms serve as the reproductive system's main line of defence against infection. Certain species of the genus Lactobacillus, which convert epithelial glycogen into lactic acid, usually predominate in a healthy vaginal microbiome.[17] This process creates a hostile environment for opportunistic infections by maintaining a pH between 3.8 and 4.5, which is acidic. Additionally, these helpful bacteria generate defensive compounds including bacteriocins and hydrogen peroxide (H_2O_2).[26] Maintaining microbial balance, that is eubiosis, here is crucial for avoiding bacterial vaginosis, vulvovaginal candidiasis, and preventing sexually transmitted infections (STIs). It is also strongly linked to good pregnancy outcomes and a decreased risk of preterm birth.

Vaginal dysbiosis is the state of microbial imbalance in vaginal tract, characterized by depletion of protective, lactic acid producing Lactobacillus species.[23] Therefore, vaginal dysbiosis is not just a single disease entity but a broad spectrum of microbial imbalances marked by overgrowth of various anaerobic or aerobic bacteria as well as fungal species along with reduced lactobacillus.[14] The shift from state of eubiosis to dysbiosis involves interaction among hormonal regulation, host genetic factors and extrinsic factors such as sexual behaviour and hygiene practices. This condition is major reason for gynaecological consultations due to symptoms such as abnormal discharge, pruritus and malodour.

Vaginal dysbiosis is particularly significant public health concern, estimated around 30% nationwide among women of reproductive age[16]. Prevalence of Bacterial Vaginosis ranges from 15 to 46%,[28] whereas Vaginal Candidiasis estimates range from 25 to 60%.[20] Trichomoniasis, comparatively less common, still is reported in around 6 to 10% of population.[4] A very high prevalence of abnormal vaginal discharge ranges from 40 to 73%[30] highlights the need for preventive and integrative management strategies.

The *Ayurveda* framework defines health as balance of three *Dosha – Vata, Pitta* and *Kapha;* seven *Dhatu* and effective removal

of *Mala*. The equilibrium is extremely rhythmic in context of female reproductive cycle, fluctuating with cycles of moon and is known as *Rituchakra*. Precise regulation of these bio-energetic forces is essential for maintenance of local vaginal environment – including pH, microbial flora, and mucosal integrity. When the equilibrium between dosha is disrupted, local environment of *Yoni* becomes prone to diseases. There are specific physiological and psychological functions that are connected to each dosha. If one or more dosha become unbalanced, distinct physical, mental and emotional symptoms male their appearance.

Agni is the ultimate energetic-metabolic force that governs all processes of transformation, digestion and assimilation in body. It ensures proper conversion of food into energy. The relationship between *Dosha* and *Agni* determines state of individual's health.[10] When agni is strong the *Doshas* are balanced, whereas *Agni* impaired by *Dosha* imbalance produces *Ama.*[6] *Ama* is understood as food that has not been digested completely, clogs the channels of body, which is termed as *Strotorodha,* and affects health.[31] *Ama* may be partially understood through modern concept of dysbiosis. It is rather understood as localized expression of *Ama* – associated pathology. *Ama* acts as pathological soil which allows harmful microbes to take root and cause diseases.[8]

When this *Ama* circulates and settles in *Artavavaha Srotas,* it causes obstruction to these channels, that is *Strotorodha*. This environment then serves as breeding ground for *Vaikarika* or *Bahya Krimi* (pathogenic microbes).[24] The natural and beneficial flora can be understood as *Sahaja Krimi,*[12] which eventually gets displaced by *Vaikarika Krimi*. In *Ayurvedic* literature, dysbiosis related conditions are classified under *Yonivyapada.*

A comprehensive understanding of vaginal dysbiosis, hence requires integrative framework that extends beyond the pathogen-focused models. This review aims to understand vaginal dysbiosis through contemporary microbiome science while exploring Ayurvedic concepts for complementary insights and integrated management approach.

This review was conducted by combining contemporary biomedical and classical *Ayurvedic* sources. Relevant articles published up to December 2025 were studied through systematic searches in PubMed, Scopus, Google Scholar and Web of Science using keywords like "vaginal dysbiosis, vaginal microbiome, Ayurveda and Yonivyapada". Classical *Ayurvedic* texts including *Charaka Samhita*, *Sushruta Samhita* and *Ashtang Hridaya* were screened to extract concepts which were then correlated with modern findings to develop framework.

Normal Vaginal Microbiome :

It is a stable ecosystem of beneficial micro-organisms that maintains a healthy and protective environment for reproductive health.

Key characteristics are –

1. ***Lactobacillus dominance*** – species like *L. crispatus*, *L. gasseri*, *L. jensenii*, and *L. iners* makes up 90% of healthy microbes in vaginal tract of female that produces anti microbial compounds to protect the host.
2. ***Acidic pH*** – these bacteria produce lactic

acid, hydrogen peroxide and bacteriocins which maintains a pH between 3.8 and 4.5. This acidic pH acts as a critical defence mecha nism that suppresses the growth of pathogens and inhibits infection.

3. *Low microbial diversity* – low diversity dominated by Lactobacillus leads to healthy condition, whereas increased diversity is often a marker of dysbiosis or disease.

4. *Dynamic Stability* - The menstrual cycle, pregnancy, and phases of life from puberty to menopause, all affect the microbiome, which is a complex ecosystem. A healthy system maintains the Lactobacillus-rich composition in spite of these variations.

5. *Hydrogen peroxide* (H_2O_2) – It is produced by Lactobacillus species. It is potent antimicrobial compound which generates oxidising metabolites. These metabolites causes deadly breaks in DNA of pathogenic cells, resulting in control of growth of undesirable microbes.

In modern molecular biology, the vaginal microbiome is becoming defined by concept of Community State Types (CSTs).[21] This classification allows clinicians and researchers to move beyond the traditional healthy versus infected theories to a more complex picture of microbial ecology. Researches using 16S rRNA gene sequencing has identified five major CSTs that characterize vaginal ecosystem in reproductive age women.

The system has 5 main types –

1. CST I – dominated by Lactobacillus crispatus. It is most stable and protective type, maintaining a low pH around 4.5 and gives a strong defence against the infections.[15]
2. CST II – dominated by Lactobacillus gasseri. It also has a low risk of infection.
3. CST III – dominated by Lactobacillus iners. It is considered less stable than others. It is transitional and makes environment more susceptible for dysbiosis.
4. CST IV – it is Lactobacillus – deficient type, characterized by high microbial diversity. It is strongly associated with infections.
5. CST V – dominated by Lactobacillus jensenii. It is rare but protective.

The Lactobacillus-Dominated Profiles (CST I, II, III, and V) – 4 out of main 5 CSTs are identified by dominance of specific Lactoba cillus species. They give a varying degree of protection against dysbiosis and associated complaints.

As per *Ayurveda,* vaginal eubiosis is a state where equilibrium of *Dosha* and proper functioning of *Agni* creates a protective environment. The key components are –

1. *Sahaja Krimi* – microorganisms that play a vital role in maintaining health are termed as *Sahaja Krimi* or *Avaikarika Krimi*. It is part of natural physiology and primary defence mechanism of body.[2]

2. *Pachaka Pitta* and *Agneya* environment – healthy vaginal environment is described as *Agneya*, can be understood as acidic in nature. It is a direct manifestation of *Agni* and influence of *Pachaka Pitta*[3]. It is essential for inhibiting growth of pathogen or *Vaikarika Krimi.* It also supports biochemical transformations needed for tissue health and hormonal respon siveness.

3. Kledaka Kapha – stability and structural integrity of vaginal mucosa are governed by *Kledaka Kapha.* It provides moisture, lubrication and acts as shield for delicate tissues.

4. Apana Vayu - subtype of *Vata Dosha* which has downward moving force, located in pelvic region. It acts in timely expulsion of *Artava* (menses), *Mala* (metabolic waste) and *Garbha* (childbirth).
5. Shuddha Artava – it is clinical indicator of a healthy microbiome. Normal reproductive fluids signifies that *Artavavaha Srotas* is normal and healthy.

When the equilibrium between *Apana Vayu, Pachaka Pitta* and *Kledaka Kapha* is maintained, the local environment of *Yoni* remains normal.

Pathophysiology :

Vaginal dysbiosis is defined as a state of microbial imbalance characterized by depletion of Lactobacillus species. It leads to significant increase in microbial diversity. It involves complex mechanism –
1. pH elevation and Loss of acidification – in healthy state, the Lactobacilli are primarily anaerobic or microaerophilic; they metabolize glycogen, from vaginal epithelial cell, into lactic acid through fermentation, rather than oxygen. It maintains acidic environment that has protective function against pathogens. Decline in lactobacilli leads to rise in vaginal Ph, often more than 4.5, which facilitates colonization of pathogens.
2. Biofilm formation – pathogens have ability to form highly structured polymicrobial biofilms on vaginal epithelium. It acts as protective shield and gives shelter to anaerobic microbes from host immune response and antibiotic treatments.
3. Enzymatic degradation – pathogens produces virulence factors which degrade protective mucus layer and mucin glycoproteins. It damages vaginal mucosa and in long term, impairs sperm function.
4. Immune and inflammatory response – the overgrowth of pathogens activates host cell receptors and triggers production of pro – inflammatory cytokines. This localized inflammation compromises mucosal barrier and increases chances of sexually transmitted infections.

Risk Factors:

1. *Intrinsic factors* – biological factors that can affect vaginal microbiota..
   a. Hormonal fluctuation – changes in hormones during menstrual cycle, pregnancy and menopause are primary cause of dysbiosis. It causes estrogen deficiency that leads to epithelial thinning and higher pH.
   b. Health conditions — chronic illnesses like Diabetes Mellitus and obesity are related with higher risk of infections.
   c. Genetic predisposition — genetic variations related with mucosal barrier, such as those affecting estrogen receptors or antimicro bial peptide production, may affect local defence mechanisms.

2. Extrinsic factors – behavioural and environ mental factors that disrupt the eubiosis of vagina.
   a. Antibiotic treatment – regular use of broad-spectrum antibiotics can decrease the protective barrier, allowing organisms like candida to grow.
   b. External practices – activities such as vaginal douching, use of harsh soaps or internal deodorants destroys natural balance and self-cleaning mechanism of vagina.
   c. Sexual habits – multiple sexual partners, high frequency of sexual activity are substantial risk factor for bacterial vaginosis and STIs.

d. Lifestyle choices – smoking and excessive alcohol intake is associated to greater instances of dysbiosis.
e. Contraceptive use – the use of some contraceptives, such as IUCDs or COCPs may alter eubiosis.

As per *Ayurveda,* no *Yoni Vyapad* can occur without *Vata Dosha* involvement.[11] Any factor disturbing *Vata* disrupts balance, paving path for dysbiosis and secondary infections by *Pitta* or *Kapha* dominant pathogens.

Samprapti in *Ayurveda,* state of *Doshic Vaigunya* and *Kha – vaigunya* within reproductive tract is understood as Vaginal dysbiosis.

1. *Agnimandya* and *Ama* formation – *Samprapti* begins with impaired digestive power (*Mandagni*) which leads to production of *Ama*. This *Ama* is sticky, foul smelling and serves as pathological soil for infections.
2. *Dosha* aggravation and spread – vitiated *doshas,* especially *Kapha* and *Vata,* combine with *Ama* in digestive tract. By mobile nature of *Vata*, this ama spreads through *Artavavaha Srotas*.
3. Localization and Obstruction – this sticky *Ama* causes *Strotorodha* (channel obstruction). This affects the *Agneya* nature of vaginal tract, raising the pH.
4. Microbial proliferation – in this obstructed and moisture – heavy (*kleda*) habitat, *Vaikarika Krimi* grow. As *Kapha Dosha* is dominant it manifests *Kaphaja Yonivyapada,* characterized by white slimy discharge and itching, and may be associated with burning sensation.

Clinical Features :

The vaginal dysbiosis manifests primarily as vaginitis, each with various characteristics[5]–

1. Bacterial vaginosis – thin, homogenous and greyish white vaginal discharge that sticks to vaginal walls. It has typical dishy odour, common after intercourse and pH is greater than 4.5.
2. Vulvovaginal candidiasis or Yeast infection – thick, white, curdy discharge resembling cottage cheese. It is characterised by intense itching, redness and swelling.
3. Trichomonal vaginitis – profuse, frothy, greenish to yellow discharge with offensive smell. It is associated with irritation, dysuria and strawberry appearance of cervix.
4. Atrophic vaginitis – seen mostly in post-menopausal women, seen as thinning of vaginal walls, dryness, burning sensation and discomfort during intercourse.

Ayurveda describes all symptoms under *Yonivyapada* and *Artava Dushti,* based on *Dosha* involved.

1. *Vataja* – scanty, thin, frothy and dry discharge associated with intense, sharp or pricking pain, stiffness and local dryness.
2. *Pittaja* – yellow, blue or blackish discharge with cadaveric smell. It is often associated with burning sensation, pus formation and fever.
3. *Kaphaja* – thick, white, slimy discharge that feels cold and is associated with itching, dull or negligible pain.
4. *Krimi* related – when hygiene is neglected microbes or parasites cause severe itching and abnormal increase in sexual desire, which is due to constant irritation.

Diagnosis : modern diagnostic criteria involves 2 main system.

1. Amsel's criteria[25] – mostly used in OPD for

bacterial vaginosis. It requires 3 of following –

a. Thin white or grey homogenous discharge
b. Vaginal pH – more than 4.5
c. A positive Whiff test (fishy odour on adding 10% KOH)
d. Presence of Clue cells on wet mount microscopy

2. Nugent Scoring[29] – gold standard scoring that involves Gram staining of vaginal smears. A score of 0-3 is normal, 4-6 is intermediate, and 7-10 indicates BV.

Treatment :

Modern treatment approach involves targeted antimicrobial.

- Bacterial vaginosis is primarily treated with Metronidazole or Clindamycin.[1]
- Vulvovaginal candidiasis requires antifungals such as Fluconazole or Clotrimazole.[27]
- Recent trends includes probiotics (*Lacto bacillus rhamnosus*) and Vaginal Microbiota Transplantation (VMT)[9] for recurrent cases.

In *Ayurveda* management focuses on breaking *Samprapti* through three core pillars –

- *Nidana Parivarjana* – eliminating causative factors like unhygienic practices or sedentary habits.
- *Deepana – Pachana* – improving digestion and clearing *Ama*.
- *Sthanika Chikitsa* – it involves local therapies like *Yoni Prakshalana, Yoni Pichu, Yoni Varti*.
- This is helpful along with use of *Shamana* drugs to balance *Dosha* and strengthen reproductive tissues.

Complications :

Failure to manage vaginal dysbiosis can lead to long term health issues.[13] Complications common are –

- Pelvic inflammatory disease
- Infertility (*Vandhyatwa)*
- Obstetric risks – increased risk of preterm labour, premature rupture of membranes and spontaneous abortion.
- Oncogenic risk – persistent dysbiosis facilitates growth of High Risk Human Papilloma Virus, responsible for increased risk of cervical dysplasia and eventual cervical cancer.
- *Artava Kashaya*- scanty menses or secondary amenorrhea.

Integration of *Ayurvedic* principles with modern gynaecological science changes the way we think about treating symptoms. Instead of trying symptomatic relief we should focus on ecosystem restoration.

Focusing on root-cause correction through systemic metabolic stability is distinguishing feature of *Ayurvedic* gynaecology. It emphasises *Prakriti Vighatana,* which involves altering host environment to avoid infections and facilitates symbiotic *Krimi. Ayurved* also prefigures gut-vagina axis by identifying the way *Agni Dushti* and gut borne *Krimi* spread along *Dhatu* chain and affect reproductive *Upadhatus*.

A fundamental principle of Ayurvedic

science is that health is directly linked to condition of *Agni* and *Koshtha*. *Agni* is considered the vital energy, needed for digestion and metabolism; whereas *Koshtha* refers to hollow spaces containing organs, represents pathway of digestion and elimination. Hence *Koshtha Pariksha* is essential before planning treatment. Understanding Agni-Koshtha relation allows physician to decide dose and duration of treatment. *Deepana – Pachana* corrects *Agni,* an essential step in management as it leads to improvement of *Artava* and *Rasa Dhatu.* Digestion of *Ama* leads to clearing *Srotas* so that healthy microbes can flourish. It also prepares body for *Sthanika Chikitsa*.

Sthanika Chikitsa represents heart of *Ayurvedic* principles of management. It provides several distinct advantages over oral administration. It has targeted action. It ensures high drug concentrations at site of infection and in direct contact with vaginal wall. It bypasses first-pass hepatic metabolism. There is no drug degradation by gastric acids, hence better availability and action of bioactive herbal compounds. The high vascularity and anatomical folds of vaginal canal gives a vast area for rapid medicinal absorption. It acts directly on clearing unhealthy tissues, debris and biofilms. It restores normal vaginal pH and microecology.

Despite its benefit and clinical depth, there are few knowledge gaps in current literature. There is need for standardized protocol for validating how traditional herbs modulate microbial CSTs. Even though classical texts emphasize safety, modern practice lacks quantifiable data, cytotoxicity, tolerability and biocompatibility of various drugs used in formulations. The case reports show high efficacy, but there is high rate of recurrence of bacterial vaginosis and vulvovaginal candidiasis. Hence there is need for integration and transition from tradition to trend, through scientific validation. There is need for multi- centre Randomized Controlled Trials to compare Ayurvedic protocols against first line antibiotics. Future trials should target vulnerable populations, such as postmenopausal women suffering from vulvovaginal atrophy and pregnant woman at risk of infections. By bridging these gaps through research, practitioners can offer a healthcare model that restores vaginal health effectively.

In conclusion, vaginal dysbiosis is not only a localized microbial overgrowth but also a complex manifestation of systemic imbalance. *Ayurvedic* science provides a framework for understanding these imbalances. By understanding role of *Vata* and *Agni,* it offers a deep healing that is superior than systematic relief. Clinical efficacy of *Sthanika Chikitsa* highlights an ancient understanding of intravaginal drug delivery. It has ability to restore mucosal pH and a healthy microbiome. It prevents the side effects, which are associated with long-term antibiotic use. As modern medicine struggles with increasing threat of antimicrobial resistance, *Ayurvedic* approach presents more holistic and vital alternative. However, the validation of these ancient protocols through trials and studies is essential to integrate *Ayurvedic* wisdom into global healthcare. It is essential to ensure long term well being for woman across all stages of life.

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