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## Exploring the Ayurvedic Concepts for Reproductive Tract Infections

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### ABSTRACT:

In the wider dimension of prevalence of RTIs throughout the globe, and lack of effective, safe and economic management, the need for exploring alternative medical systems was increasingly emphasized. A concept research was conducted to investigate Ayurvedic concepts for RTIs using comparative literature from Ayurveda and modern medicine. The results show a fair ground to understand the factors undergoing RTIs and throw a great promise to integrate the *Ayurvedic* concepts with the ongoing interventionist strategies to address RTIs effectively.

**Keywords:** Reproductive tract infection, *Ayurvedic* Concepts, Seasonal/diet regimen, integration.

### INTRODUCTION

Reproduction is an innate process of the living beings for continued existence. Human beings, in particular, struggle for existence without pain. One among the hurdles for continuing existence with quality life is Reproductive Tract Infections (RTIs). Reproductive tract infections are the infections due to the entry/presence of microorganisms in the genital tract. They affect both women and men. The annual incidence of RTIs is about five percent globally<sup>1</sup>. An incidence of 376 million people with curable and a prevalence of 1076 million people with either incurable or preventable infections world-wide is a huge magnitude which represents only sexually transmitted infections (STIs), a sub-group of RTIs (WHO-2016)<sup>2</sup>. Around 6 per cent of the adult population in India (30%) are diagnosed with sexually transmitted diseases (STDs) and reproductive tract infections (RTIs) each year<sup>3</sup>.

The typical RTIs, having the characteristic features of

absence of the symptoms or non-susceptive symptoms, need different tests for individual infections, varying sensitivity and specificity of the diagnostic techniques, higher costs of diagnostic techniques are the situations lead to improper diagnosis. Missed treatment of asymptomatic STIs, the untreated STIs lead to various complications as ectopic pregnancy, spontaneous abortion, stillbirth, neonatal death, and low-birth-weight and prematurity, sepsis, pneumonia, neonatal conjunctivitis, blindness and congenital deformities, increased risk of HIV, PID, cervical cancer, infertility etc. Syndrome management approach has led to overtreatment resulting in decreased susceptibility as well as the emergence of drug resistant varieties<sup>4</sup>.

The incidence of HIV in females among adults is 47 percent out of which 20 percent are in the age group of 15-24 years in 2015<sup>5</sup>. RTIs in women are the universal health problem occupying the second position in the public health problems in the developing countries. In India, the



prevalence rate ranges from 19-71 percent across the states<sup>6</sup>. Despite the fact that RTIs have a negative impact on women's social well-being, they are overlooked. Morbidity and mortality due to RTIs deprive the women's contribution to the society<sup>7</sup>. A woman undergoes various physical and physiological changes during her Reproductive Period from menarche to menopause. Awareness and management of these changes are necessary for women to remain healthy.<sup>8</sup> It is in this context to provide a better prevention, control and cure, there is a need to have an insight into the infections with their etiology, pathogenesis, clinical features, complications, diagnostic techniques and treatment of RTIs. World Health Organization is laying an increased focus on alternate systems of medicine for addressing RTIs.

### The Objective and Method:

This paper explores *Ayurvedic* Conceptual Framework for RTIs by relating the concepts of *Ayurveda* with reference to *vyadhis* (disease)-*doshas* (three humours), *prakriti* (body constitution) to provide a better prevention with that of modern literature on etiology, pathogenesis and clinical features of common RTIs in females as contained in Annex .The *Ayurvedic* conceptual framework in this paper is confined to the *nidana* (causative factors), *samprapti* (pathogenesis), *lakshanas* (clinical features) and preventive aspects of RTIs in which *Ayurveda* is strong.(Table.2)

### Etiology:

It is evident that, most of the RTIs are sexually transmitted. In women, overgrowth of endogenous microorganism normally found in the vagina may cause RTI (candidiasis, bacterial vaginosis). Apart from these, medical interventions may provoke iatrogenic infection in several ways-endogenous organisms from the vagina or sexually transmitted organism in the cervix may be pushed during a trans-cervical procedure into the upper genital tract and cause severe infection of the vagina, cervix, uterus, fallopian tubes and other pelvic organs. If infection control is poor, the organism can spread to the upper genital tract. They are kept under the heads as Exogenous, Endogenous and Iatrogenic according to mode of transmission<sup>9</sup>. *Ayurveda* believes the three *sariraka* and two *manasa doshas* as the internal factors of health and disease. The changes in them are inevitable in endogenous as well as in the exogenous factors of the disease. *Ayurvedic* diseases/situations along with predominant *doshas* are

given under for the identified etiological factors of RTIs.

### Biological factors

Variouso microorganisms like bacteria, virus, fungus, protozoa causing the infections are grouped under the biological factors. In *Ayurvedic* literature, the organisms are termed *krimi* classified as *sahaja* (normal micro biota) and *vaikarika* (pathogens). It is an established fact that the lactobacilli and lactic acid producing micro biota form the normal flora of the vagina. *Vaikarika krimi* originate from *bahya* (external) and *abhyantara* (internal) *malas* (waste products). *Krimis* due to *bahyamala* are *malaja* arise due to *mrujavarjana* (non-cleanliness). The *krimis* produced from *abhyantara malas* are *raktaja* (from blood), *sleshmaja* (from sleshma) and *purishaja* (from faeces). Thus, they are born over the hairs, skin and, in the body in *sleshma*, *rakta* and *purisha*. Based on the modern theory of production or habitat of the causative organisms of RTIs they are kept under the different types of *abhyantara malas*<sup>10</sup>.

The causative factors with respect of diet and lifestyle are detailed for the production of *abhyantara malas*. Intake of excess milk, jaggery, sesame seeds, black gram, fish, *Anupa Mamsa* (meat of animals inhabiting in marshy land), *Pishtanna* (flour preparations), *Paramanna* (rice cooked in milk), *Kusumabha taila* (*Carthamus tinctorious* Linn). Uncooked- putrefied- stale - infected food; *viruddha* (food having mutually contradictory properties) and unwholesome food lead to the vitiation of *slesma*, *rakta* and *purisha*. Lack of exercise, sedentary life, sleeping in day time, exposure to sun, exposure to sudden change of temperature, fear, intercourse and exercise after excessive food intake vitiate the *dhatu*<sup>11</sup>. Disease is state of altered or vitiated state of *Dhatu*<sup>12</sup>. Variation in these body elements occurs due to various external and internal factors. External factors like food, lifestyle, environmental factors like air, water, soil, climate etc. influence the body elements as well the production, transmission and multiplication of the micro biota. The level of vitiation of the body elements may express all or some of the symptoms of the disease. The change in the anatomy and physiology of the elements give a hint of vitiated *doshas*. To the leading to trauma or microbes, disease occurs only after *Doshic* vitiation. Directly lead to manifestation of disease followed by involvement of *Doshas*. Thus the etiological factors of the disease may be in relation to *Acharya Susruta* describes that certain diseases like *Kustha* (group of skin diseases), *Jwara* (pyrexia or fever), *Shosha*

(kock’s or tuberculosis), *Netrabhishyanda* (conjunctivitis) etc. are due to *Prasanga* (intercourse), *Gatra Sansparsha* (direct contacts), *nishwasa* (inspiration), *sahabhojana* (eating together), *sahashayya and aasna* (sleeping and sitting together), sharing and using of others’ cloths, ornaments and ointments<sup>13</sup>. Thus, the spread of diseases from person to person is explained. This is Aupsargika roga (contagious disease). Apart from this, *Charaka Samhita* describes the role of *Vayu* (air), *Udak* (Water), *Desha* (soil & area), *Kala* (Time) as the factors responsible for *Janapadodhwansa* – epidemics<sup>14</sup>.

### Socio-Demographic and Behavioral Factors:

Apart from these biological factors researches reveal the other factors such as socio-demographic, social, behavioral patterns those cause or augment the diseases. The awareness, consultation and timely intervention at the individual level result in prevention, control and cure of the disease. The identified causes of the modern research are taken along with the concepts of *Ayurveda* seen in the description of diseases with their predominant *doshas*, females with their body constitution who are prone to the diseases and the time period when they are easily affected or affected more. (**Table 1**). The *sariraka doshas* of *vata*, *pitta* and *kapha* are vitiated at the end, middle and at the start respectively with regard to day, night, age, digestion, menstrual cycle. The females of prakriti similar to the predominant *doshas* are affected with the aetiological factors. *Vata* is vitiated during *greeshma*, *varsha* seasons; *Pitta* during *sharad*, *hemanta* seasons; *Kapha* during *sisira*, *vasanta* seasons. Adoption of diet and lifestyle suitable to one’s body constitution and the measures as contained in *Ritu Charya*, help in low occurrence of disease<sup>20</sup>.

### Pathogenesis-

*Bahyakrimis* invade *kesa*, *smasru*, *loma*, *pakshma*, *vasamsi* (clothes)<sup>21</sup>. Trichomycosis axillaris (trichobacteriosis) is a superficial infection of the axillaries and less commonly, pubic hairs. This disorder usually occurs after puberty, owing to its association with axillary and pubic hair, but then occurs with equal frequency in all post pubertal age groups. Pubic lice, Candidiasis affect the vulva<sup>22</sup>.

The external factors like diet and lifestyle change the internal environment resulting in susceptibility. This condition favors the production of pathogens. The appearance of clinical features is indirectly proportional to the strength of the tissues. The vulval infections may

spread to the lower genital tract through the contiguity of the structures and from there to peritoneal cavity as the tract is continuous. The other way is the direct contact with the infected person. The other external factors like use of needles for injections intramuscular/ intravenous, surgical instruments with improper/ insufficient sterilization after using on infected persons<sup>23</sup>. Others include Blood transfusion, reflux of menstrual blood with pathogens into the fallopian tubes and spreads through lymphatics, resulting in infection, inflammation, deeper penetration and tissue destruction.

The changes in the *doshas* with the diet and life style are considered as internal factors. Thus, the diseases occurring are the *nija vyadhis* (endogenous). The exogenous and iatrogenic together are *agantuja vyadhis*. The quantity and quality of the *doshas* affect the structure and function of the *dhatus*, and the quality and quantity of the *malas*. The decrease in *kapha dosha* results in the increase of *vata*.

### Clinical Features-

RTIs are classified based on the site of the infection as lower genital tract infections and upper genital tract infections. Based on the etiology as exogenous, endogenous and Iatrogenic, RTIs are broadly classified on the presence or absence of the ulcer as ulcerative and non-ulcerative. Syphilis, Chancroid, Donovanosis (Granuloma inguinale), Lymphogranuloma venereum (LGV), Genital herpes fall under the category of ulcerative with chancre, painful necrotizing, nodule burst, painless ulcer, blisters break open to form painful ulcers respectively. The tissue destruction is seen in this type. The appearance of clinical features depends on the biotic factors such as infectivity duration and the presence of other STDs. However, the commonly encountered clinical features of RTIs are Backache, Vaginal discharge, Low abdominal pain, itching around vaginal area, Painful or burning urination, urethral discharge, Painful intercourse, Genital ulceration, Inguinal swelling, Foul smell discharge, Redness in genital area, something bulging out of vagina<sup>24</sup>. These clinical features are considered for the collection of diseases in *Ayurveda* classics along with the vitiation of *doshas*. The pain and something bulging out of vagina is due to *vata*; burning urination, painful inter course, redness, foul smell discharge are due to *pitta*; itching, urethral discharge is due to *kapha* and swelling, ulceration, vaginal discharge due to *tridoshas*. (Table 2)

### Diagnosis: (Table 3)

#### Specific and Nonspecific:

Specific infections are diagnosed appropriately through the diagnostic techniques. Infection is diagnosed as nonspecific when efficient routine microbiological techniques fail to identify any of the common genital pathogens in appropriate specimens. Clinically, most such cases present as non-gonococcal urethritis in men, but non-specific cervical and vaginal infections are also extremely common. In the modern science, they are identified by the presence of organisms in the body fluids or tissues. The changes in the structure and function are examined by *sara pariksha*, *ashtasthanapariksha*, *aturabalapramana* using the *pratyaksha*, *anumana* and *aptopadeshapariksha*<sup>26</sup>.

### CONCLUSION

Exploration of influencing factors of RTI in *Ayurveda* framework give promising results that can be harnessed for finding solutions to prevent most of the RTIs, particularly, the STDs characterized by vaginal discharges, itching, pain. In case asymptomatic cases, adopting the diet and life style should be modified according to the *doshas* that increase or vitiate the exercise exhibits preventive aspect in seasonal factors, diet, life style and addressing both symptomatic and asymptomatic situations in an effective manner that can be integrated with the ongoing intervention programs of RTIs.

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**Table 1 Comparison of Causes other than biological with the Diseases, *Doshas* and *Prakriti* as per *Ayurveda*<sup>15</sup>**

Description	Causes	Disease <sup>16</sup>	<i>Doshas/ Prakriti</i> <sup>17</sup>
1	2	3	4
<b><i>Socio-demographical Factors</i></b>			
Age	Early sexual activity	<i>Prakcharna</i>	<i>Vata</i>
Education	lack of knowledge to maintain personal hygiene and family planning	<i>Acharana</i>	<i>Kapha, Jantu</i>
Migration	With an alarming rise in married populations migrating for work, it is possible that these migrants are engaged in risky sexual behaviour, putting their wives at risk for infectious disease outcomes, including reproductive tract infections (RTIs)	<i>Aticharana</i> <i>Upadamsa</i> <i>Phiranga</i>	<i>Vata</i>
Background	Lower class women are not using sanitary napkins and sterile equipment	<i>Acharana</i>	<i>Kapha, Jantu</i>
Ethnicity	black young women most at risk for RTIs in young adulthood	<i>Pittala</i>	<i>Pitta</i>
Occupation	Working women who have increased mental stress due to work load, which put effect on the neurogenic system in our body	<i>Vatala</i>	<i>Vata</i>
<b><i>Social Factors</i></b>			
Marriage	Marriage below 19 years, pregnancy below 20 years.	<i>Prakcharana,</i> <i>Aticharana</i>	<i>Vata</i> <i>Vata</i>
<b><i>Behavioral Factors</i></b>			
Knowledge	Lack of awareness about RTIs and use of barrier contraceptives, early onset of sexual activity and false beliefs, 28% women used sanitary napkin <sup>18</sup> .	<i>Aticharna</i> <i>Prakcharana</i> <i>Acharana</i>	<i>Vata</i> <i>Vata</i> <i>Kapha</i>
Practice	<b><i>Sexual-</i></b> Early sexual activity, Having multiple partners, Frequent sexual partner exchange, unsafe sex (not using condom for sexual intercourse). skin piercing, consumption of alcohol and drugs, Blood transfusion.	<i>Prakcharana,</i> <i>Aticharna</i> <i>Upadamsa</i> <i>Phiranga</i>	<i>Vata</i>
<b><i>Biology of females</i></b>			
Anatomical	Adolescents/Youth are at most risk because of immature sexual organs.	<i>Suchimukhi</i> <i>Ojovyapad</i>	<i>Vata</i>
Physiological	During menstruation, pregnancy and child birth women are risk of developing RTIs due to inborn physiological characteristics of the female Reproductive facilities. not maintaining hygiene <sup>19</sup> .	Not following <i>Rajaswalacharya,</i> <i>Gabhiniparicharya,</i> <i>Sutikaparicharya</i>	<i>Vata</i>
Hormonal	Due to normal variation in a woman’s oestrogen level in each cycle in every month.	<i>Balakshaya</i>	<i>Vata</i>

Immunological	Low immunity females are more prone. Disturbed normal defence mechanism – in vulval, vaginal, cervical, uterine and Tubal defence.	<i>Aticharna</i>	<i>Kapha</i>
<b>5.Iatrogenic</b>			
	More common where there are many STIs and where health care providers do not have the training or supplies. Occurs when a medical procedure introduces a micro-organism into the reproductive tract, e.g., because of improperly sterilised surgical instruments. Infections follow surgery for benign or malignant disease, episiotomy or vaginal stenosis and atrophy following pelvic irradiation.	<i>Agantujasothe,</i> <i>Agantujavrana</i> <i>Adaksha Chikitsa</i> <i>chatushpada</i>	<i>Vata/ pitta/ Kapha</i>

**Table 2.Clinical Features of RTIs vis-a vis Ayurveda.**

<b>Clinical features</b>	<b>Disease</b>	<b>Dosha</b>
Abnormal vaginal discharge	<i>Sannipatik</i> <i>Kaphaja</i> <i>Upapluta</i>	<i>Tridosh</i> <i>Kapha</i> <i>Vata-Kapha</i>
Genital pain	<i>Vatala</i> <i>Aticharna</i> <i>Prakcharna</i> <i>Paripluta</i> <i>Putraghni</i> <i>Antarmukhi</i> <i>Sucimukhi</i> <i>Suska</i> <i>Vamini</i> <i>Mahayoni</i> <i>Phalini</i>	<i>Vata</i> <i>Kapha</i> <i>Vata</i> <i>Vata-Kapha</i> <i>Vata</i> <i>Vata</i> <i>Vata-Pitta</i> <i>Vata</i> <i>Vata-Pitta</i> <i>Vata</i> <i>Tridosh</i>
Genital itching	<i>Kaphaja</i> <i>Acharna</i> <i>Vipluta</i> <i>Karnini</i> <i>Sucimukhi</i> <i>Atyananda</i>	<i>Kapha</i> <i>Kapha</i> <i>Vata</i> <i>Vata, Kapha, Rakta</i> <i>Tridosh</i> <i>Kapha</i>
Spasmodic dysmenorrhoea	<i>Udavartini</i>	<i>Vata</i>
Lower Abdominal pain	<i>Sannipatiki</i>	<i>Tridosh</i>
Menstrual irregularities	<i>Vatala</i> <i>Pittaj</i> <i>Paripluta</i> <i>Mahayoni</i>	<i>Vata</i> <i>Pitta</i> <i>Vata-Pitta</i> <i>Vata</i>
Bilateral lower abdominal pain	<i>Paripluta</i>	<i>Vata-Pitta</i>
Dyspareunia	<i>Paripluta</i>	<i>Vata- Pitta</i> <sup>25</sup>

**Table 3. Shows Aetiology, Pathogenesis, Clinical Features**

RTI Infection/Disease	Aetiology		Pathogenesis		Clinical Features	
	Causative Organism	Germ Type	Transmission Mode	Incubation Period	Site	Symptoms Female
1	2	3	4	5	6	7
Chancroid <sup>27</sup>	Haemophilus ducreyi	Bacteria	Sexual Contact	1 day- 2 weeks	Red bumps on the labia and anus or on the thigh	Painful ulcers, Dysuria, Dyspareunia
Chlamydia <sup>28</sup>	Chlamydia Trachomatis	Bacteria	Sexual Contact	6-14 days	Abnormal discharge from the vagina Inflammation of the cervix	Dysuria, Dyspareunia
Donovanosis <sup>29</sup>	Klebsiella granulomatis	Bacteria	Sexual Contact	10-14 days	Lesion located on the cervix, Labia minora, fourchette and upper genital tract	Pustule break, Erosion of tissue
Gonorrhoea <sup>27</sup>	Neisseria gonorrhoea	Bacteria	Sexual Contact	3-7 days	Upper genital tract, vagina, rectum	Dysuria, Vaginal Discharge
Syphilis <sup>30</sup>	Trypanoma Pallidum	Bacteria	Sexual Contact with a sore, VT	9-90 days	Cervix, skin, mucous membranes, lymphnodes, vulva and around the anus.	Painless ulcer, Condyloma lata, Gumma
Genital herpes <sup>31</sup>	Herpes Simplex Virus-1,2	Virus	Sexual Contact mucous membranes	2-14 days	Mouth, cervix, anus, buttocks, thighs, in or around the vagina and the urinary tract	Vesicle, ulcer, Inguinal Lymphadenopathy
HIV/AIDS <sup>32</sup>	HIV	Virus	Sexual Contact, Infected Syringes, BT, VT breast milk,	9 month - 20 years	Sores and lesions are present on the skin of the mouth genital and anus Swollen glands	Early flu like symptoms, swollen glands, skin rashes and sores, Infections, Fever and night sweats, Menstrual changes, STIs, PID and diarrhoea, nausea, vomiting and weight loss
Genital warts <sup>33</sup>	HPV	Virus	Skin mucosal contact	2-3 month	Inside the vagina, or anus, outside the vagina or anus, on the cervix Also appears on the lips, mouth, tongue or throat	Warts, Carcinoma cauliflower-like) appearance.
Trichomoniasis <sup>34</sup>	Trichomonas vaginalis	Protozoa	Sexual Contact, toilet articles	2-28 days	Redness or soreness of the genitalia	Profuse vaginal Discharge, Itching, dysuria
Candidiasis <sup>35</sup>	Candida Albicans	Fungus	Endogenous spread, contacts with mouth, skin and faces, during child birth	2-5 days	Vulva and vagina	Redness, swelling and Itching in the vulva, burning, Soreness, curdy appearance
Bacterial Vaginosis <sup>36</sup>	Change in the normal balance of the vaginal bacteria	Bacteria	Multiple sex partner Vaginal douching	4-5 days	in vagina	Vaginal itching and grey, foul smell vaginal discharge Burning micturition



