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A CRITICAL REVIEW ON INFERTILITY DUE TO THIN ENDOMETRIUM

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Abstract: Infertility is included under non communicable diseases, which possess significant physical, psychological, social and financial burden on the couples who are affected with the same. Among the factors causing infertility, endometrial abnormalities plays an important role. Endometrium is important as a receptive endometrium with an adequate thickness of minimum 7mm is essential for the implantation of blastocyst. Low endometrial thickness is one of the most important challenging factor, even Artificial Reproductive Techniques (ART) like IVF fails if the endometrium is not supportive for proper implantation resulting in either infertility or early pregnancy loss. In contemporary system hormonal therapies and invasive procedures are used for treating Infertility. Many of these have found to be less effective. Majority of patients could not afford the cost of these artificial reproductive techniques. Ayurveda can provide a solution to this major problem, which is within the reach of common man. It is necessary to modulate a well accepted Ayurveda approach towards the disease and formulate principles of management.. In Ayurveda there is no direct correlation of Thin endometrium. Increased *rooksha guna* of V*ata*, *ushnateekshna guna* of *Pitta* along with *dhatvagnimandya* resulting in *arthavadhatu kshaya* leads to Thin endometrium. This disease can be correlated to *Dhathu Kshayaja Vandhya* mentioned in Hareeta Samhitha. So treatment of Thin endometrium should be *Dhatwagni deepanam, brimhana, balya* and *Vatapitta hara.*

Keywords*- Thin endometrium, Infertility, Endometrial receptivity, *Arthava kshaya, Dhathukshayaja Vandya

I. INTRODUCTION

The definition of *stri* is "*Styayati yasmat garbha iti stree*". Acharya Caraka said that women is the origin of progeny and reproductive stage of the woman and her health determine the health of the progeny.

Acharyas mention the quotations like '*swartha budhi parartheshu*' and '*stree tu loke pratishtita'* which shows the importance of *stri* in *Ayurveda*. *Stri* is compared to mother earth as both have the quality of forbearance and procreation and *swasthya* means health. A woman procreates and nurtures a family, in turn a society, thereby she perpetuates this universe. Hence health of a family/society/universe revolves around a woman, her health is vital to sustain the same. So females are considered as most important creations of god especially for her ability to reproduce. But this blessing sometimes becomes a curse for her on the verge of infertility which is the most disastrous gynecological problem.

Vandyathva is the failure to achieve a successful pregnancy after a year or failure to conceive for several years after the first delivery. Acharya Haritha has described *Vandhyatva* as failure to continue pregnancy till end rather than to achieve a pregnancy. *Ayurveda* considers the intricate interplay of *doshas*, *dhatus* and *agni* as essential elements governing the reproductive health of a woman. In the context of reproduction, *Ayurveda* considers not only the physiological aspects but also the psychological and emotional wellbeing of a woman. As described in our classics "*Soumanasyam garbhadharananam sreshtam*"[1], stress, anxiety, and emotional imbalances are believed to influence hormonal axis and can lead to menstrual irregularities and fertility issues. From time immemorial the phenomenon of infertility was prevalent throughout the world and this may persists till the human race exists. Every human being has an inherent, intense desire to continue his (one's) own race; to become a mother is one of the most cherished desires of every woman.

The intricate and multifaceted journey towards parenthood often finds its path obstructed by a myriad of challenges, one of which is Thin endometrium among infertile women. The endometrium is a dynamic tissue, plays a pivotal role in embryo implantation and successful pregnancy establishment. However, when this crucial lining fails to attain an optimal thickness, it poses a significant barrier to conception and may lead to repeated implantation failures and pregnancy losses. The phenomenon of Thin endometrium has captured the attention of researchers, clinicians, and fertility specialists alike, prompting a compelling need for a deeper understanding of its underlying mechanisms, diagnostic approaches, and potential interventions. Addressing infertility is very important as it has significant negative social impacts on the lives of infertile couples and particularly women, who frequently experience violence, divorce, social stigma, emotional stress, depression, anxiety and low self-esteem therefore proper diagnosis and treatment of infertility is essential in each case of infertility, but lack of trained personnel, necessary

equipment and infrastructure and currently high costs of treatment medicines are major barriers even for countries that are actively addressing the needs of people with infertility.

In Ayurveda there is no direct reference of Thin endometrium but condition can be most appropriately correlated with *Dhathukshaya Vandhya*, one among six types of *Vandhya* explained in Haritha samhitha.[2] It is due to depletion of *dhathus* or due to inadequate formation of *dhathus*, especially *rasa dhathu* and its *upadhathu arthava* which in turn leads to reduction in fertility potential and ultimately *anapathyatha*.

DISEASE REVIEW

Infertility is defined as the inability to conceive after 1 year of unprotected intercourse of reasonable frequency. It can be subdivided into *primary infertility*, that is, no prior pregnancies, and *secondary infertility*, referring to infertility following at least one prior conception. Fecundability is the ability to conceive.

Critical events for achieving successful pregnancies

Successful pregnancy requires a complex sequence that includes:

- **Ovulation**
- **Ovum pick-up by a Fallopian tube**
- **Fertilization**
- **Transport of a fertilized ovum into the uterus**
- **Implantation into a receptive uterine cavity:** Embryo implantation represents the most critical step of the reproductive process in many species. Successful implantation requires a receptive endometrium, a functional embryo at the blastocyst developmental stage, and a synchronized dialogue between maternal and embryonic tissues[3].

Endometrial receptivity is a limited time-related period when the uterus is receptive to blastocyst attachment and implantation. The establishment of this endometrial transition, which supports embryo implantation, is primarily coordinated by ovarian hormones, estrogen, and progesterone[4]

Endometrial receptivity and selectivity are complementary concepts describing the endometrium as a biosensor of embryo quality. Selectivity is an intrinsic programmed function of the endometrium to recognize and reject embryos with reduced development potential. In contrast, receptivity enables the endometrium to provide an optimal environment for embryo development and placenta formation[5.]

ENDOMETRIAL RECEPTIVITY MARKERS:

1. HISTOLOGY MARKERS:

Histology-dating of endometrium.

The dating of the endometrium described by Noyes et al. (1950) dates from more than 50 years ago. Endometrial Dating method detects individual maturation sequences during the secretory phase. Well dated endometrial tissue is required inorder to study the molecular features of endometrium during the menstrual cycle and to identify the receptive phase in the endometrium, especially in patients with suspected endometrial factor infertility, endometrial biopsies need to be taken with precise timing.The short period in the menstrual cycle when the endometrial receptivity is optimal, and embryo implantation is possible is called the "window of implantation" (WOI). The self-limited period of endometrial receptivity usually spans between days 20 and 24 of the menstrual cycle (dating of the endometrium)[6].

Pinopodes

Pinopods are bleb-like protrusions found on the apical surface of the endometrial epithelium. These structures are several micrometers wide and project into the uterine lumen above the microvilli level. They were first described in mice and later in human endometrium. The term 'pinopod' is the Greek word meaning 'drinking foot,' which signifies their pinocytotic function. Electron microscopy is the primary tool used to observe these structures

Pinopods are present throughout the mid to late-secretory phase, displaying cycle-dependent morphological changes. It suggests that morphology, rather than pinopod presence or absence, is of great significance. The pinopod-regulated expression pattern throughout the menstrual cycle advocates their use as markers of implantation. Pinopods appear progesterone dependant.
Although the role of pinopods remains unknown, they seem to be the preferred sites of embryo–endometrial interactions. Blastocyst attachment was shown to occur on the top of endometrial pinopods. Hypothetically, the receptors required for blastocyst adhesion are located on the pinopod surface. Endometrial pinopods' development is associated with the mid-luteal phase increased expression of leukemia inhibitory factor (LIF) and its receptor, progesterone, and integrin αVβ3. Detecting pinopods during the mid-secretory phase may be extremely useful for assessing endometrial receptivity to optimize implantation rates[5].

2. MOLECULAR MARKERS

(A) Endometrium proliferates under estrogen enhancement.
(B) Progesterone from luteinized follicles leads to endometrial differentiation.
(C) The blastocyst enters the uterus through the Ostia and rolls freely over the endometrium under signals by L-selectin.
(D) Mucin-1 (MUC-1) repels the blastocyst and prevents its adhesion to endometrial areas with poor chances of implantation.
(E) Chemokines and cytokines attract the blastocyst to the optimal implantation spot.

(F) Adhesion molecules (e.g., integrins and cadherins) firmly attach the blastocyst to the endometrial pinopods to ensure further successful implantation[7].

3. ENDOMETRIAL RECEPTIVITY MARKERS EVALUATED BY ULTRASOUND

Because of its accuracy and non-invasiveness, transvaginal ultrasound is widely used in assisted reproduction for monitoring follicles and evaluating endometrial receptivity. The modified version of Appelbaum's uterine scoring system is widely used in predicting the uterine receptivity in embryo transfer cycle. The assessment was done based on **Appelbaum's "USSR"** by TVS by color Doppler. It includes the following parameters: Endometrial thickness (mm), endometrial layering, myometrial echogenicity, uterine artery Doppler flow (pulsatility index [PI]), endometrial blood flow in zone 3, and myometrial blood flow (gray scale).

The ultrasonic markers for evaluating endometrial receptivity include:

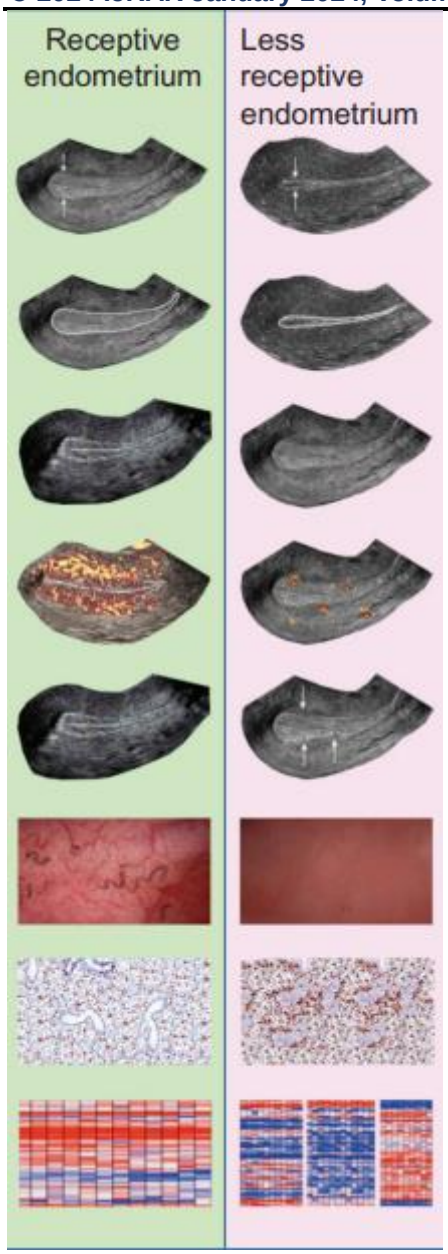
Endometrial thickness: Endometrial thickness is one of the most widely used evaluation markers and prognostic indicator for measuring endometrial receptivity. Studies have shown that the embryo implantation rate increases significantly when the endometrial thickness reaches 7 or 8mm.

Endometrial volume: It is a neglected ultrasound marker of endometrial receptivity and can be a more comprehensive representation of the entire endometrium than the endometrial thickness of a particular section. In recent years, due to the development of ultrasound technology, more and more studies have been conducted on the relationship between endometrial volume and embryo implantation. May use it as the markers to evaluate endometrial receptivity.

Endometrial pattern: The echo of the endometrium with a triple line pattern can be used as one of the predictors of clinical pregnancy.

Doppler signals: More and more studies have shown that the blood flow of the endometrium is crucial for embryo implantation. The blood supply of the endometrium comes from radial arteries, which pass through the myometrium-endometrial junction and divide into the basilar artery supplying the basal layer, then form a spiral artery to the surface of the endometrium. At the junction of the myometrium and the endometrium, ultrasound shows a hypoechoic area called the sub-endometrial area. Three-dimensional Doppler ultrasound can detect the blood flow of the endometrium and sub endometrium.

Endometrial wave-like activity: The inner part of the myometrium has been revealed to generate contractions controlled by estrogen and progesterone changes, causing the endometrium to develop wave-like or peristaltic movements. In general, the direction of endometrial movements is from the fundus to the cervix during the menstrual period, facilitating the discharge of menstrual blood. With the increase in estrogen levels, the direction of endometrial movements is mainly from the cervix to the fundus in the middle of the menstrual cycle, which helps transport sperm. After ovulation, increased progesterone inhibits myometrium contraction. The reduced and irregular endometrial movements contribute to blastocyst implantation. The relationship between the frequency, direction, and amplitude of endometrial movements and pregnancy outcomes needs to be further studied in the field of assisted reproduction.[8]



TYPICAL USE OF ENDOMETRIAL RECEPTIVITY MARKERS

ENDOMETRIAL THICKNESS

ENDOMETRIAL VOLUME

ENDOMETRIAL PATTERN

ENDOMETRIAL BLOOD FLOW

ENDOMETRIAL CONTRACTIONS

HYSTEROSCOPY INSPECTION

UTERINE NATURAL KILLER (uNK) CELLS

Figure1: Endometrial receptivity markers assessed through USG

3. ENDOMETRIAL RECEPTIVITY MARKERS EVALUATED BY ENDOMETRIAL BIOPSY:
evaluate following parameters:

- Histology and cytology
- Other molecular marker
- Endometrial receptivity array

Endometrial receptivity analysis (ERA) is a genetic test that takes a small sample of a woman's endometrial lining to determine which day would be the best day to transfer the embryo during the IVF cycle. Performing an endometrial receptivity analysis can be incredibly helpful as the window of endometrial receptivity can be one of the causes of infertility in women who have had two or more unsuccessful embryo transfers following in vitro fertilization (IVF). If the biopsy is performed in the embryo transfer cycle, it could have a detrimental effect on implantation. Thus most biopsy has been performed in a cycle prior to the embryo transfer cycle. It determines the best time for embryo implantation in a future transfer cycle.

There are three potential results:-
Pre receptive-This indicates that the endometrium is not quite ready to receive the embryo, and transfer at this time may not ideal.
Receptive: This indicates that the moment the endometrial biopsy was taken was the optimal time to transfer the embryo for implantation.
Post receptive: This indicates that the endometrium has reached the stage.

4. ENDOMETRIAL RECEPTIVITY MARKERS EVALUATED BY FLUID ASPIRATE: Endometrial Fluid covers the endometrium, lubricating and protecting it, aiding its proper function. It is thought that its protein content, mostly from the endometrial secretions, plays a crucial role in embryo implantation but has now gone past it[9].

5. ENDOMETRIAL RECEPTIVITY MARKERS EVALUATED BY HYSTEROSCOPY: Hysteroscopy is performed to evaluate and treat the uterine cavity, tubal ostia, and endocervical canal. It allows the direct visualization of the uterine cavity through a rigid or flexible endoscope. Evaluating the uterine cavity is a fundamental step when investigating all subfertile women since the uterine cavity and the endometrium are both very important for the implantation of human blastocyst[10].

Table1: ETIOLOGY OF FEMALE INFERTILITY

Ovulatory dysfunction	• PCOS • Hypothalamic-pituitary Amenorrhea • Age-related Menopausal Transition • POF
Tubal disease	• Tubal block due to infection, pelvic adhesions etc
Uterine abnormalities	• Thin endometrium • Congenital Anatomic Disorders • Leiomyomas • Asherman syndrome • Endometritis
Other	• Endometriosis

Management

Treatment of female infertility varies according to the cause.

- Ovulatory dysfunction-lifestyle modification and ovulation induction by clomiphene citrate therapy or gonadotropin with follicular monitoring by ultrasonography.
- Luteal phase defect-as it is due to progesterone insufficiency, treatment with natural progesterone will be effective.
- Tubal and peritoneal factors-corrected only by surgery. Tubal micro surgery or cannulation may be attempted but chances of ectopic pregnancy are high. Therefore most women with tubal block require invitro fertilisation.
- Intrauterine insemination (IUI) is the treatment of choice for cervical factor.
- Management of unexplained infertility is by ovulation induction/IUI or assisted reproductive techniques (ART): like IUI, IVF, ZIFT, GIFT etc.[11]

THIN ENDOMETRIUM

Thin endometrium is defined as endometrial thickness 7mm or less than 7mm especially around the time of ovulation.

Incidence

A thin endometrium is seen more often in older women probably because of decreased vascularity. An incidence of 5% has been reported in women less than 40 years and 25% beyond age forty in natural cycles. Almost all infertile women with history of scanty menstruation and first trimester abortions is having thin endometrium and implantation failures especially in assisted reproductive techniques.

Causes of Thin endometrium

Low oestrogen
Fibroids
Pelvic inflammatory disease
Poor quality of endometrial tissue
Inadequate uterine blood flow
Excessive use of Clomiphene
Long term use of Birth control pills.
Iatrogenic: Surgical – repeated or vigorous curettage damages the basal layer of endometrium.Hysteroscopic myomectomy, polypectomy, or laparoscopic myomectomy where the cavity is openedmay lead to IU adhesions

Thin endometrium can result from various factors the most common being inflammatory and iatrogenic. Poor vascularity and low estradiol values can also lead to poor endometrial growth. The endometrium can also be inherently thin in some women.

Pathophysiology

It is demonstrated that thin endometrium were characterized by poor growth of glandular epithelium, high uterine blood flow impedance, decreased vascular endothelial growth factor (VEGF)expression, and poor vascular development. It is postulated that a high blood flow impedance of radial arteries acting as the trigger impaired the growth of the glandular epithelium and resulted in a decrease inVEGF levels in the endometrium. Low VEGF, in turn, causes poor vascular development, which further decreases blood flow in the endometrium. This vicious cycle leads to a "thin endometrium".[12]

Symptoms of Thin endometrium

- Irregular/abnormal menstruation
- Scanty bleeding
- Infertility
- Pregnancy in Thin endometrium.

If women are suffering with issues related to pregnancy, like unable to get pregnant or difficulty in holding a pregnancy, they must check their oestrogen level and endometrial thickness. Endometrium must be atleast 7mm thick for successful implantation of the foetus. If it is thin i.e. less than 7mm, implantation doesnot take place that culminates in to the failure of pregnancy. Therefore, one needs to get treatment for Thin endometrium to become pregnant[13]

Treatment of Thin endometrium

Since a Thin endometrium is a multifactorial condition, its management should be cause-related, with the aim of increasing endometrial receptivity and simplifying implantation. However, improving endometrial growth in patients with thin endometrium is very challenging; several regimens have been tried in the literatures like Hysteroscopic adhesiolysis, hormonal manipulation by oestrogen, GnRH-antagonist, B-HCG, vasoactive measures like aspirin, vitamin E, pentoxyfylline, sildenafil, intrauterine infusion of growth factor such as G-CSF, Platelet Rich Plasma (PRP) and the recent application of regenerative medicine like stem cell therapy, Endometrial Receptivity Array (ERA)[14]

AYURVEDIC REVIEW

In ayurveda there is no direct reference for Thin endometrium, but symtoms of thin endometrium can be seen in *Arthava dhathu kshaya lakshna* mentioned by Susrutha acharya.If this *arthava dhathu kshaya* not treated properly finally results in Vandyathwa. Also Ayurveda considered *beeja dusti* an important cause for *vandyathwa.*

Arthava kshaya

If we review our classics *Artava kshaya* has not been mentioned as a separate disease but it has described as a symptom of many gynaecological disorder.

Nirukthi of arthava kshaya-

"*Raktasya pramanahani" Raktha-raja/artava.*

Pramanahani-decrease in amount - can correlated to decrease in endometrial thickness i.e Thin Endometrium.

***Lakshanas* of *Artava kshaya*[15]**can be correlated with certain menstrual disorders that are as follows.

- *Yadhochita kala adarshanam* (oligomenorrhea)
- *Alpata* (Hypomenorrhea)
- *Yonivedana* (Dymenorrhea).

Nidana* and *Sampraptihi

Nidanas

↓

Vishamagni

↓

Vata pitta dusti

↓

Rasa dhatwagni mandya

↓

Utharothara dhatu kshaya

↓

Dhathu kshayaja vandya

***Nija nidanas**: Mithya ahara viharas*, Factors responsible for *rasa-raktha dhatu kshaya, Vata pitta dusti*, *ruksha guna* of vitiated *Vata dosha*, ↑*ushna* and *tikshna guna* of vitiated *pitta dosha.*

Aganthu nidanas Surgical procedures like D & C, myomectomy, infections and inflammatory conditions affecting reproductive svstems

Dhathukshayaja Vandyatwa

Acharya *Harita* has mentioned *balakshaya vandya*[16] as one among 6 types of *vandhya* and *dhatu kshaya* as one of the reason for *vandhyatwam.* It is due to depletion of *dhatus* or due to inadequate formation of *dhatus*, especially *arthava* and *sukra dhatu* which in turn leads to reduction in fertility potential and ultimately anapathyatha.

- According to Acharya *Caraka,*

"Yonipradoshat manasoabhitapath sukraasrukahara viharadoshat
Akalayogath balasamkshayat cha garbha chirath vindathi sapraja api[17]*"*

- Harita in the treatment aspect of *vandhya* has mentioned

Sidyanthi ksheena dhathuthwat jayathe sa bhisakvara[18]

Dhatukshayaja vandya become capable of conception after undergoing proper treatment.

Dhatukshayaja vandya can be devided at 3 levels

- *Rasakshaya, arthavakshaya- poorva roopa avastha*
- *Rasadhi saptha dhatu pariksheena- Vyadhyavastha*
- *Balakshaya- Upadrava roopa vyadhi.*

Chikitsa:

The treatment princile includes-treating the underlying pathological condition of infertility, Avoiding the etiological factors (Nidana parivarjana), basic treatment methods for Dhathukshayaja Vandyatva, and following regimens indicated in Garbhadhana.

Nidana Parivarjana: Infertility is a condition caused by different etiological factors. Identifying those causes and strictly avoiding them is the first and foremost thing in the treatment.

Treatment for *Dhathukshayaja vandya:* *Dhathu* is derived from the Sanskrit word "*dhatahvao deha dhaaranaath"*[19]- that which upholds the body as a substratum. The ability to perform systemic functions are the result of healthy *dhathus*. If the *dhathus* become weak and unable to perform its function due to vitiation of imbalanced doshas continuously, it leads to disease and death.

Dhatukshaya is considered as one of the main reasons to initiate pathogenesis. Main reason behind *saptha dhathu kshaya* is *dhatwagnimandya* (metabolic dysfunction), ultimately leds to *ojokshaya* or *bala kshaya*. Caraka has been quoted that by the medicine, *sareera dhathus* attain their equilibrium state.

As the disease pathogenesis start with the *rasa dhathu kshaya*, drugs which possess *rasayana, vrishya* , and *brihmana* properties found to be be beneficial in *dhathukshayaja vandya*.

Pitta governs the digestion in the body. The genitourinary tract is governed by *Vata dosha*, and by the *Apana Vata* in particular[20]. Because *Vata* is by nature cool, if excessive heat accumulates due to imbalanced *Pitta dosha*, it can create an imbalanced environment in the reproductive systems. In addition, *sukra dhathu* is *soumya dhathu*, as opposed to a *agneya dhatu* such as *raktha*. *Sukra* needs *soumya kshetra* in order to support fertility. Powerful *Pitta* and *Vata* balancing formula not only creates a healthy environment for *beeja* but also reduces anger and increases resistance to emotional stress and fatigue.

The process of stimulation of *jadaragni* is called *deepana* and *pachana* does the digestion of *ama* but not stimulate *agni*. Both *deepana-pachana* removes the *saamavastha* and detaches the vitiated *dosas* which are adhered to *srotas*.

Snehana should be done after *deepana* and *pachana*. It does *snigdhatha*, *vishyanthatha, mardavatha, kledatha* of *sareera*[21]. *Saptha dhatus* are formed from the *sneha saara*. Thus proper *snehana* does *jadaragni vrudhi*, *kosta visudhi*, formation *of pratyagra dhathus, bala, varna* and also increases life span[22]`. *Snehana* is also the first line of management in *Vataja rogas*[23].

Rasa is the first *dhathu* formed after the metabolism of food. If the *rasa dhathu* formation is affected , it leads to chain reaction of malformation of other *dhathus*, i.e. *uttharothara dhathu kshaya*. The prime function of *rasayana* is to rectify this process and revitalize *saptha dhathus.*

Rasayana which has marked action on reproductive organs and also nourishes *sukra dhathu*. *Rasayana* nourishes the whole body and improves natural resistance against infection by increasing immunity power. It does *vayasthapana, ayushkara, medhakara,* and *urjaskara* etc actions by promoting the nutritional value of the *rasa* which in turn helps in obtaining the best quality of *dhathus* and *upadhatus* such as *arthava* which will give a promising hand to cure *vandhyathwa*.

Regimens indicated in *Garbhadhana*: *by Shodhana (proper purification),* maintenance of *Sadvritta*, avoiding negative emotions *yoni, Garbhashaya, beeja* and *manas* will remain unvitiated and leading to healthy pregnancy by perfect unification of beeja.

Shodana karma* along with other basic methods in *Vandhyatva:

• *Virechana*- best treatment for *Dhathukshayaja vandya* where *Vata* and *Pitta* as the main cause of vitiation. According to Kashyapa Samhita, by *virechana, "beejam bhavati karmukam."*

• *Basti – Niruha Basti* is considered as *Amrutha* for an infertile woman.
Anuvasana Basti is an ideal treatment for *Alpa dosha, Kashta Artava* and *Nashta Beeja.*
Yapana Basti is very ideal in *Stree Bandhyatva.* It performs both *Niruha Basti* and *Anuvasana Basti* which does both *Snehana* and *Shodhana karma*.
Uttara Basti removes the *Srotorodha* and corrects the *Artavagni* which regulates the menstrual cycle.

•*Nasya* - The medications administered through the nasal route reaches the *Shiras* and helps in pulsatile action of Gonadotrophin releasing hormones and thus, helping in treatment of infertility. *Lakshmana Kalka* with Ghee or milk for *Nasya* is indicated.

•*Other yogas: Narayana Taila, Shatavari Taila, Phala Ghrita, Lasuna Ghrita, Shatavari Ghrita, Kalyanaka ghrita.*

PATHYA-APATHYA

The women suffering from *yoniroga* should follow diet and habit which must normalise the vitiated *dosha*. The diet and mode of life must be for the normal functions of *Vata* and *Pitta*. The *dravyas* which possess *dhatuposhana*, *agneya*, *srotoshodana* such as *sura, asava, arishta, Lasuna rasa, ksheera, Mudhga, Godhooma, Sali, Jangalamamsa rasa, Kulatha*, should be consumed daily in appropriate quantity. Food prepared with *Yava, Seedhu*, powder of *Pippali* and *Hareethaki* are beneficial. In arthava kshaya conditions *agneya dravyas* like *Tila, Masha, sura* and *suktha* can be advised. As per *kasyapa, Lasuna* is highly beneficial in *Vandyathwa.* In *nastarthava Matsya, Kulatha, amla rasa dravyas, Sarshapa, Masha, dadhi* and *suktha* is advised. According to *Basava rajeeya, Mudga, Godhuuma, Saali, Jangala rasa, ghritha* and *ksheera* are *pathya* in *yoni roga*.

In *yonirogas aharas* and *viharas* causing *agnidushti* such as *adhyasanas*, *vishamasana*, *athichintha*, *diwaswapna*, *ratrijaagarana*, excessive *guru-sheeta* and *virudha ahara* should be avoided. *Kasyapa* has contraindicated use of *manda* in *yoniroga*. In *Basavarajeeya* food having *katu amla lavanarasa* except *Kulatha* and *mamsa* except *jangala mamsa* are contraindicated. *Haritha* has contraindicated use of vegetables such as *kachara, surana, amla*, and use of *kanjika* and roots of *Bandhyakarkati, Langali, Katuthumbi, Devathali* and *Suryavalli* for infertile women as this possess *vidahi* and *teekshna guna*.

DISCUSSION

The entire female reproductive system is defined under the shade of *artavavaha srotas* which is having two *moolasthana*, named *Garbhasaya* (uterus) and *Artavavahi Dhamani* (fallopian tube). *Garbhasaya* is considered as seat of embryo. The fusion of *Shukra*, with *sonita* and *atma* inside *kukshi* leads to the formation of *Garbha*. Here *kukshi* or *kshetra* for implantation of a fertilized ovum is the bed of endometrium. The concept of *naveena rajasthapana* (formation of menstrual blood) every month in *garbhasaya* denotes the proper formation of endometrium in the uterus.

Artava is *upadhatu* (byproduct) of *Rasa*, but it works as *dhatu* by providing *Dharana* (implantation) and *Poshana* (nutrition) to the embryo during conception. Menstrual cycle is an indication of the state of the health of the female and can be affected by many factors, such as excessicve physical exercise, diet, life-style, stress, emotional instability. Any of these can create an imbalance of the *ojas, doshas (Vata, pitta, kapha)* and *dhatus.* As per Bhavaprakasha *arthava* is considered as 7th *dhathu* and *sukra* as 8th dhathu and is the main factor which nourishes the foetus and enhances *bala, varna* and *sukrapushti*. As per Caraka and Susrutha formation of *arthava* and *sthanya* is from *rasa dhathu* which indicates formation of *dhathu/upadhathu roopa arthava*.

The most appropriate correlation of Thin endometrium can be done with *Dhathu kshaya vandya* explained in Harita samhitha is due to depletion of *dhathus* or due to inadequate formation of *dhathus*, especially *rasa dhathu* and its *upadhathu arthava* which in turn leads to reduction in fertility potential and ultimately *Anapathyatha*. In early stages *Dhathukshaya vandhya* is manifested as *rasa kshaya*, *arthava kshaya* and in *vyadhyavastha*, *rasadhi saptha dhathu pariksheena* occurs .finally it leads to *Bala kshaya.*

Women are challenged with *rasa* depletion *(rasa dhathu kshaya)*. The demands of today's society with back to back shedules, long work hours with equally hectic social lives, and stress in every corner of life, including relationships can exhaust and dry out *rasa*. To further the effect, it is becoming increasingly difficult to provide the body with proper nutrition from wholesome, non-genetically modified, pesticide and chemical free foods.

Vata and *Pitta* doshas are the cause of *rasa dhathu* depletion. *Vata* can also block healthy *rasa* flow to and from the uterus by constricting and causing spasms in channels like arteries supplies endometrial bed. *Pitta* dosha get vitiated due to a lifestyle that is too highly focused, competitive, and intense, as well as from a diet that is too spicy and hot.

Increased *rooksha guna* of *Vata* and *ushna teekshna guna* of *Pitta* along with *dhatvagnimandya* resulting in *Rasa dhatu kshaya* which further leads to *upadhatu roopa arthava kshaya*. So treatment of Thin endometrium should be *dhatwagni deepanam, brimhana, vrishya, balya, rasayanam* and *Vata Pitta hara.*

CONCLUSION

Social, environmental, psychological, and nutritional variables have all contributed to a rise in Infertility.Among varius causes of Infertility, Thin endometrium, is a condition characterized by insufficient uterine lining, which possess significant challenges to successful conception and implantation. Hormonal therapies and invasive procedures are used for treating Thin endometrium. Many of these have found to be less effective. The genesis, clinical characteristics, and treatments of *Vandhyatva* have been sporadically recorded in several Ayurvedic scriptures. It is described under the heading of *Yonivyapad, Artava dushti, Beeja dushti, Jataharini ,Matrijbhavadusti* etc. Ayurveda is an excellent option for fertilisation because it treats all body types and strengthens the bodily systems involved. Ayurveda stimulates the pituitary and hypothalamic glands, increases *Ojas*, and boosts entire reproductive system. Ayurveda offers a non-invasive, low-cost, non-iatrogenic alternative and complement to current western therapy for infertility.

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Figure1:

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