

Management of *Vandhyatva* w.s.r. to thin endometrium through *Ayurveda*- A single arm open labelled pilot clinical trial

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Abstract

Background: The four essential factors of conception are *Ritu* (optimum period for conception), *Kshetra* (place of conception), *Ambu* (nutrition), and *Beeja* (healthy sperm and ovum). *Kshetra* denotes body as general and to be very specific, especially about the female reproductive system, it is *Garbhashaya* or the uterine cavity and function is *Garbhadhana* or conception. The endometrial factor is an important subset in infertility due to poor implantation. **Aims:** To evaluate the efficacy of *Saubhagyanandana Ghrita Yonipichu* (vaginal tampon) and *Jeevaniya Churna* orally in the management of thin endometrium thickness and to evaluate its efficacy in the associate complains of menstrual abnormalities, i.e., irregularity of menstrual cycle, quantity, duration and pain. **Materials and methods:** It was a single-arm open labeled pilot clinical trial, a total of 15 female patients having endometrial thickness <7 mm on transvaginal sonography findings were included in the study. Each patient ($n = 15$) was given *Saubhagyanandana Ghrita Yonipichu* (10 mL for 6 days after cessation of menses, for 1 cycle) along with *Jeevaniya Churna* orally 10 g along with milk twice before meals for 30 days. Assessment of the study was done on Appelbaum's uterine scoring system for the reproduction (USSR) scoring pattern. **Results:** Results were analyzed by the paired t -test for the objective parameters and Wilcoxon signed rank-sum test for the subjective parameters. A statistically highly significant difference ($P < 0.001$) was seen in endometrium thickness, layering, myometrial echogenicity, uterine Doppler flow, endometrial blood flow in zone 3, and total USSR score. Statistical significant difference ($P < 0.05$) was found in the menstrual abnormalities and a highly statistically significant difference ($P < 0.001$) was found in ovulation. One of the patients conceived after the treatment. **Conclusion:** *Saubhagyanandana Ghrita Yonipichu* (vaginal tampon) and *Jeevaniya Churna* orally are effective in improving the thin endometrium.

Keywords: Appelbaums' scoring pattern, endometrium factor, infertility, *Jeevaniya Churna*, *Yonipichu*

Introduction

According to *Ayurveda*, infertility primarily refers to the biological inability of a woman of reproductive age to contribute to conception and also the state of a woman who is unable to carry a pregnancy to full term. Infertility is defined as an inability to conceive a pregnancy after 1 year of unprotected intercourse.^[1] It can either be primary where no previous pregnancy has occurred or secondary where there has been a previously documented pregnancy. *Vandhyatva* (infertility) is a psychosocial problem and the psychosocial trauma of prolonged infertility on the couple is enormous.

The World Health Organization estimates that 60–80 million couples worldwide currently suffer from infertility.^[2] Infertility varies across the regions of the world and is estimated to

affect 8%–12% of couples worldwide.^[3] According to the International Federation of Gynecology and Obstetrics manual (2015), the causes are peritoneal factors (35%), tubal factors (30%), ovulatory factor (20%), and uterine factor (15%). Among these uterine factors, as-endometrial abnormalities play an important role in the causation of infertility. The majority of times unexplained infertility is associated with endometrium morphology. Implantation is necessary for a successful pregnancy and requires healthy endometrial

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receptivity.^[4] The implantation rate (10.17%) is significantly lower in patients with thin endometrial thickness.^[5] Thicker endometria corresponded with higher implantation rates. Poor endometrial lining most commonly occurs in women with a history of unexplained recurrent *in vitro* fertilization (IVF) failures or early recurrent miscarriages. The endometrial lining is routinely measured using the vaginal ultrasound in IVF cycles and is expected to be of adequate thickness for embryo implantation. An endometrial thickness of 7 mm or greater is generally considered adequate thickness and <7 mm has been associated with lower pregnancy rates, with almost no pregnancies observed with a lining <5 mm. Due to this reason, many patients with IVF failure of thin endometrium have been referred to *Ayurveda* practitioners for further Ayurvedic management.

Endometrium can be understood as *Sthanika Raja* (menstrual flow) which forms by the part of *Prasada Rasa* (nutrient part of food) and *Rakta Dhatu* and proper *Sthanika Agni* (local metabolism).^[6] The main etiological elements responsible for causing thin endometrium are *Ruksha Guna* (dryness) of *Vata Dosha* and *Ushna* (hotness) and *Tikshna Guna* (sharpness) of *Pitta*. Many treatment modalities and drugs are propounded in the Ayurvedic literature for the treatment of *Vandhyatva* (infertility). The endometrium goes through cyclical changes during the menstrual cycle preparing itself for the implantation of a possible pregnancy, failing which menstruation occurs. Menstruation has been described as “the cry of dejected uterus” indicating that the whole process occurring in the endometrium is a process to get it ready for implantation of the embryo. Implantation is a complex process that involves a dialog between the embryo and the endometrium.

Saubhagyanandana Ghruta is mentioned in *Abhinava Navjeevana* text by Prof. Siddhinandana Mishra in *Vandhya Chikitsa Adhyaya*.^[7] It has properties such as *Snehana* (oleation), *Brihana* (nourishment), *Balya* (strengthening), *Rasayana* (rejuvenating), and *Garbha Sthapaka* (prevent the abortion and promotes health and qualities of intrauterine fetus). It is indicated in almost all types of *Vandhya Roga* (infertility). It also states that use of this *Ghruta* not only cures infertility but also provides a healthy progeny. The contents of *Saubhagyanandana Ghruta* are as mentioned in Table 1.

Yoni Pichu (vaginal tampon)-As mentioned by Acharya Charaka, there is no *Yoni Roga* without vitiation of *Vata*. *Snehana Karma* plays an important role in the management of *Vata Roga*.^[8] *Yoni* is the *Avayava* located at the *Apana Vata Kshetra* of the body. Due to the *Sukshma Guna* of *Sneha*, *Ghruta* administered through vaginal route gets quickly absorbs and acts on the endometrium lining of the uterus. Inserting *Yoni Pichu*, the paracervical ganglion carrying the afferent (sensory) impulses to the mesenteric ganglion causes the release of hormones which helps for priming the endometrium.^[9]

Table 1: Ingredients of *Saubhagyanandana Ghruta*

Drug	Botanical name	Part used	Ratio
<i>Kalka Dravya</i>			
<i>Shatavari</i>	<i>Asparagus racemosus</i> Willd.	Root	1 part
<i>Ashwagandha</i>	<i>Withania somnifera</i> Linn.	Root	1 part
<i>Aparmarga</i>	<i>Achyranthes aspera</i> Linn.	Root	1 part
<i>Bala</i>	<i>Sida cordifolia</i> Linn.	Root	1 part
<i>Matulunga</i>	<i>Citrus medica</i> Linn.	Root	1 part
<i>Eranda</i>	<i>Ricinus communis</i> Linn.	Root	1 part
<i>Nagakesara</i>	<i>Mesua ferrea</i> Linn.	Stamens	1 part
<i>Aatmagupta</i>	<i>Mucuna pruriens</i> Bek.	Root	1 part
<i>Drava Dravya</i>			
<i>Vatashruna</i>	<i>Ficus bengalensis</i> L.	Leaf bud	64 parts
<i>Godugdha</i>	Animal product	-	64 parts
<i>Goghrita</i>	Animal product	-	16 parts
<i>Prakshepa Dravya</i>			
<i>Nagakesara</i>	<i>Mesua ferrea</i> Linn.	Stamens	1 part

Jeevaniya Churna has properties like *Garbhasandhankrita* (retention of fetus), *Stanyakrita* (promotes lactation), *Brihana* (nourishment), *Vrishya* (aphrodisiac), *Snighdha* (unctuousness), and *Sheeta* (cold potency).^[10] Less blood supply to the endometrium is an important cause of nonimplantation of the embryo to the uterus. *Jeevana Karma* (to give life) is the main function of *Rakta Dhatu* in the human body.^[11] *Jeevaniya Churna* may help to increase the vascularity of the endometrium, thus can increase the possibility of implantation of an embryo into the uterus. The contents of *Jeevaniya Churna* are as mentioned in Table 2.

Aim and objectives

To evaluate the efficacy of *Saubhagyanandana Ghruta Yonipichu* and *Jeevaniya Churna* orally in the management of thin endometrium.

Materials and methods

Fifteen females attending the outpatient department of Prasuti Tantra and Stree Roga, ITRA, Jamnagar, with a history of infertility and having endometrium thickness ≤ 7 mm were registered in the study irrespective of caste and religion. Before starting the clinical trial approval was taken from Institutional Ethics Committee vide letter no.PGT/7/A/Ethics/2020-21/1824. The study has been registered in CTRI (CTRI/2020/02/023425 registered on: 18/02/2020). Informed written consent from each patient, willing to participate before starting the study was taken. The detailed history was filled up in the specially prepared proforma. The raw drugs of *Saubhagyanandana Ghruta* and *Jeevaniya Churna* were procured from the Pharmacy, G. A. U., Jamnagar, Gujarat. *Shatavari* (*Asparagus racemosus* Willd.) roots were collected from the local market of Jamnagar. Powder of *Matulunga* (*Citrus medica* Linn), *Mudgaparni* (*Phaseolus trilobulus* Linn), *Mashaparni* (*Teramnus labialis* [L.] Spreng), *Jivanti* (*Leptadenia reticulata* [Retz.] Wight and

Table 2: Ingredients of Jeevaniya Churna

Drug	Botanical name	Part used	Form	Ratio
<i>Yashtimadhu</i>	<i>Glycyrrhiza glabra</i> Linn.	<i>Moola</i>	<i>Churna</i>	1
<i>Vidari</i>	<i>Pueraria tuberosa</i> DC.	<i>Kanda</i>	<i>Churna</i>	2
<i>Shatavari</i>	<i>Asparagus racemosus</i> Willd.	<i>Moola</i>	<i>Churna</i>	2
<i>Ashwagandha</i>	<i>Withania somnifera</i> Dunal.	<i>Moola</i>	<i>Churna</i>	2
<i>Jivanti</i>	<i>Leptadenia reticulata</i> W and A.	<i>Moola</i>	<i>Churna</i>	1
<i>Mudgaparni</i>	<i>Phaseolus trilobus</i> Ait.	<i>Panchanga</i>	<i>Churna</i>	1
<i>Mashaparni</i>	<i>Teramnus labialis</i> Spreng.	<i>Panchanga</i>	<i>Churna</i>	1

Arn. L.), and *Kapikacchu Churna* (*Mucuna prurita* Hook) were collected from Pune. *Vatashringa* (*Ficus benghalensis* Linn.) was collected from a local vendor, Jamnagar.

Diagnostic criteria

Female patients having endometrial thickness ≤ 7 mm diagnosed by Trans Vaginal Sonography (TVS) (up to the 15th day of the menstrual cycle) were included in the study.

Inclusion criteria

Females of childbearing age of 20–40 year having active marital life of 1 year and suffering from primary or secondary type of infertility with endometrial thickness ≤ 7 mm diagnosed by TVS irrespective of its cause.

Exclusion criteria

Female patients having age < 20 years and more than 40 years. Patients having carcinoma of the reproductive tract, active inflammatory disease, e.g., acute pelvic inflammatory disorder, sexually transmitted diseases, like human immunodeficiency virus (HIV), Hepatitis B surface Antigen (HBsAg), Venereal Disease Research Laboratory (VDRL), Hepatitis C Virus (HCV), congenital anomaly of the reproductive tract, and uncontrolled systemic diseases such as diabetes and hypertension were excluded.

Investigations

Laboratory investigations were carried out in all the registered patients before and after treatment. It included hemoglobin%, fasting blood sugar levels, and urine routine and microscopic examination. Serological examination such as HIV, HBsAg, VDRL, and HCV was carried out only before treatment for ruling out the disease for exclusion purpose. Transvaginal ultrasonography (before treatment and after treatment) on the 15th day of cycle was done-to see the Appel Baums Uterine Scoring Pattern (uterine scoring system for reproduction [USSR]).^[12]

Treatment protocol for the study

Saubhagyanandana Ghrita Yonipichu 10 mL for 6 days after cessation of menses for 1 cycle along with *Jeevaniya Churna* 10 g orally with milk twice before meals for 30 days was given to the patients. Follow-up was taken for a month at an interval of 15 days.

The procedure was explained to the patients verbally as follows:

Procedure details

After cessation of menses, patients were advised to void urine and take *Avagaha Sweda* (tub bath) with lukewarm water for 10 min. Then, they were advised to dry the area with a cotton cloth. Light meal before the procedure was suggested. Patients were advised to lie down in a supine position with flexed knees and to maintain all the aseptic precautions. Patients were then explained to insert a sterile *Pichu* (tampon) soaked in 10 mL medicated lukewarm *Saubhagyanandana Ghrita* with index finger into the vaginal canal in such a way that thread of the *Pichu* (tampon) should remain out of the vagina. They were advised to lie in a supine position for 10 min by keeping a pillow below the buttocks and were counselled to retain the *Pichu* (tampon) till the urge of micturition or at least for 2 h. Patients were advised to avoid hard work and coitus after placing the *Yonipichu* (vaginal tampon).

CONSORT flow diagram showing participant flow through each stage of the randomized controlled trial (enrolment, intervention allocation, follow-up and data analysis) is as shown in Flowchart 1.

Criteria of assessment

Subjective parameter

Assessment was done on regularity of menstrual cycle, quantity, duration, and painful menses. The assessment scale is as shown in Table 3.

Objective parameter

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) [Table 4].

Statistical test

Timely noted observation was analyzed by using paired *t*-test for objective parameters and Wilcoxon signed rank-sum test for subjective parameters. Statistical calculation was made with the help of Sigma stat 3.5 software, Jandel Scientific Software, California U.S. The result was interpreted as: Insignificant $P > 0.05$, significant $P < 0.05$, highly significant $P < 0.01$, and very highly significant $P < 0.001$.

Table 3: Assessment scale of the menstrual cycle.

	Scoring
a. Duration of menstrual Cycle	
4-7 days	0
3 days	1
2 days	2
1 day	3
b. Interval between two cycles	
21 to 35 days	0
35 to 39 days	1
40 to 45 days	2
above 45 days	3
c. Quantity of menstrual blood	
4 or more than 4 pad use/cycle	0
3 pad use/cycle	1
2 pad use/cycle	2
1 pad use/cycle	3
Spotting bleedings without pads	4
d. Pain during menses (Yonivedana)	
No pain	0
Mild pain	1
Moderate pain	2
Severe pain	3

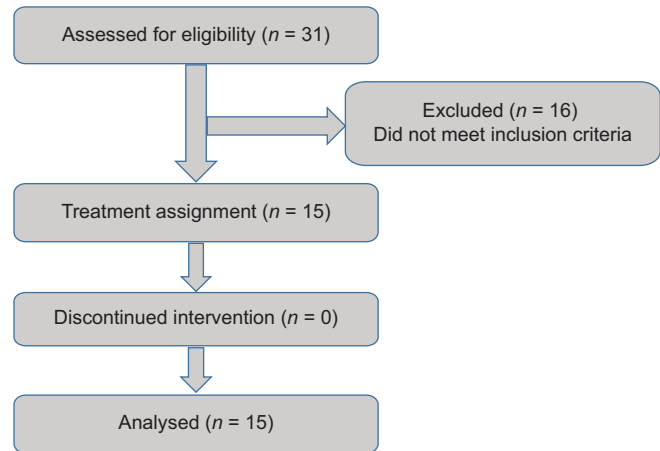
Table 4: Appelbaum's uterine scoring system for reproduction

Parameter	Determination	Score (grade)
Endometrial thickness	<7	0
	7-9	2
	10-14	3
	>14	1
Endometrial layering	No layering	0
	Hazy 5 line appearance	1
	Distinct 5 line appearance	3
Myometrial echogenicity	Course, inhomogeneous	1
	Relatively homogeneous	2
Uterine artery Doppler flow (PI)	2.99-3.0	0
	2.49	1
	<2	2
Endometrial blood flow in zone 3	Absent	0
	Present, but sparse	2
	Present multifocally	5
Myometrial blood flow (Gray Scale)	Absent	0
	Present	2

BT: Before treatment, AT: After treatment, PI: Pulsatility index

Observation and Results

A total of 15 patients were enrolled in the study. The demographic data of the registered patients, observed are as shown in the Graph 1. The *Hetus* (causative factors) observed in study showed that 86.66% patients had a history of excessive *Katu Rasa Sevana* (pungent food), 66.66% patients had history of excessive *Amla Rasa Sevana* (sour food) and 26.66% patients had history of excessive *Lavana Rasa Sevana* (salty

**Flowchart 1:** CONSORT flow diagram showing participant flow through each stage of the randomized controlled trial (enrolment, intervention allocation, follow-up and data analysis).

food), 66.66% patients had history of *Atichintana* (anxiety), and 33.33% patients had *Tanava* (stress) as a causative factor. *Strotodushiti* (vitiation of Strotasa) involved in patients is shown in graphs 2 and 3.

Effect of therapy on appelbaums uterine scoring system for reproduction scoring pattern [Table 5 and Graph 4]

Endometrial thickness

Before treatment, the mean score of grade of endometrial thickness in registered patients was 0.0 which was upgraded up to 1.46 after treatment. The result was statistically very highly significant ($P < 0.001$).

Endometrial layering

Before treatment, the mean score of the grade of endometrial layering in registered patients was 0.40 which was upgraded up to 1.86 after treatment; the result was statistically very highly significant ($P < 0.001$).

Myometrial echogenicity

Before treatment, the mean score of grade of myometrial echogenicity in registered patients was 1.33 which was upgraded up to 2.0 after treatment. The result was statistically very highly significant ($P < 0.001$).

Uterine artery Doppler flow

Before treatment, the mean score of the grade of uterine artery Doppler flow in registered patients was 0.93 which was upgraded up to 1.46 after treatment. The result was statistically very highly significant ($P < 0.001$).

Endometrial blood flow in zone 3

Before treatment, the mean score of grade of endometrial blood flow in zone 3 in registered patients was 2.06 which was upgraded up to 4.40 after treatment, the result was statistically very highly significant ($P < 0.001$).

Myometrial blood flow

Before treatment, the mean score of grade of myometrial blood flow in registered patients was 1.86 which was

Table 5: Effect of therapy on “Applebaum’s uterine scoring system for reproduction” (paired *t*-test)

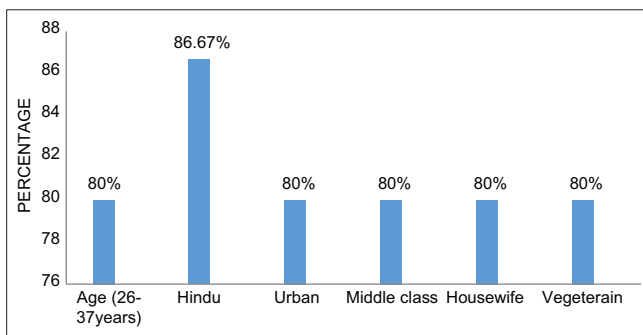
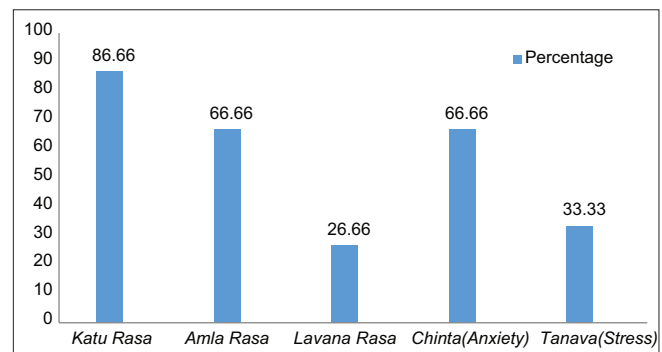
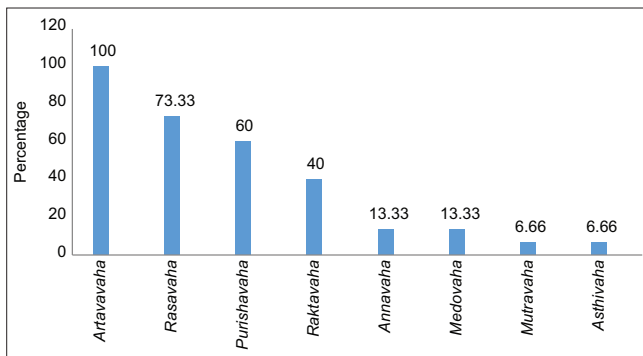
Parameter (<i>n</i> =15)	Meanscore		SD (±)	SE (±)	<i>t</i> (paired)	<i>P</i>	Significance
	BT	AT					
Endometrial thickness	0.0	1.46	0.99	0.25	-5.73	<0.001	HS
Endometrial layering	0.40	1.86	0.99	0.270	-5.73	<0.001	HS
Myometrial ecogenicity	1.33	2.00	0.48	0.00	-5.29	<0.001	HS
Uterine artery Doppler flow	0.93	1.46	0.533	0.13	-4.00	<0.001	HS
Endometrial blood flow zone 3	2.06	4.40	1.23	0.31	-7.32	<0.001	HS
Myometrial blood flow	1.86	2.00	0.51	0.13	-1.00	>0.05	IS
Total USSR score	6.53	13.66	2.66	0.68	-10.351	<0.001	HS

BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, HS: Highly significant, USSR: Uterine scoring system for reproduction, IS: Insignificant

Table 6: Effect of therapy on ovulation (paired *t*-test)

Parameter (<i>n</i> =15)	Meanscore		SD (±)	SE (±)	<i>t</i> (paired)	<i>P</i>	Significance
	BT	AT					
Ovulation	0.26	0.73	0.516	0.13	-3.50	<0.05	Significance

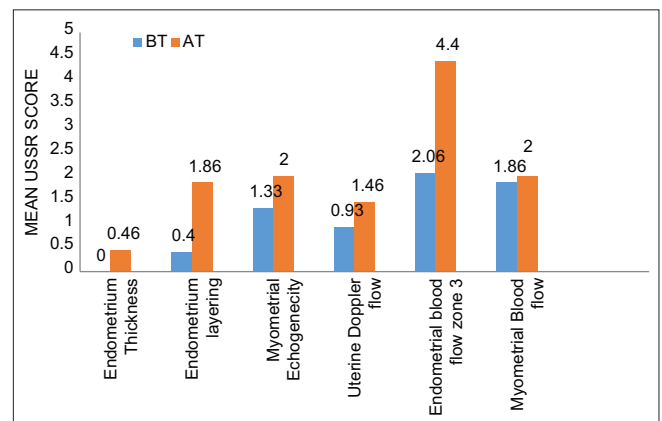
BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, *n*: Number of subjects

**Graph 1: Demographic data of the registered patients (*n* = 15)****Graph 2: Causative factors observed in the patients (*n* = 15)****Graph 3: Srotasadushti involved in the patients (*n* = 15)**

upgraded up to 2.0 after treatment; the result was not significant statistically.

Total uterine scoring system for reproduction score

Before treatment, the mean score of grade of total USSR score in registered patients was 6.53 which was upgraded up to 13.66 after treatment. The result was statistically very highly significant ($P < 0.001$). [Table 5 and Graph 4].

**Graph 4: Effect of therapy on Appelbaum's USSR (*n* = 15). USSR: Uterine scoring system for reproduction**

Effect of therapy on ovulation

Before treatment, 11 patients, i.e., 73.33% of patients had anovulatory cycles, whereas only four patients had anovulatory cycles after treatment. This means total 11 patients had

ovulation after the therapy. Thus, effect of therapy on ovulation was seen in 46.66% of patients. The result is statistically significant [$P < 0.05$, Table 6].

Effect of therapy on menstrual cycle

Before treatment, eight patients had regular periods (22–35 days' cycle) which then increased to 14 patients after treatment. Before treatment, nine patients had normal (30–80 mL) quantity of menstrual flow which then increased to 15 patients after treatment. Before treatment, 10 patients had normal duration (3–5 days) of menstrual cycle which then improved to 14 patients after treatment. Before treatment, eight patients had painless menses, which then improved to 14 patients after treatment. The result was statistically significant [$P < 0.05$, Tables 7, 8 and Graph 5].

Discussion

Recurrent implantation failure is a cause of female infertility. Therefore, pregnancy rates can be improved by optimizing endometrial receptivity for implantation. The indicators of a receptive uterus are the thickness of the lining; the “magic number” in stimulated IVF cycles based on the research and experience is 9 mm in thickness as measured by ultrasound on the day of the Human Chorionic Gonadotropin trigger shot.^[13] A lining thinner than this can compromise implantation potential. A secondary factor in assessing implantation potential (although less important than thickness) is a “triple line” appearance in the lining via ultrasound.

The entire female reproductive system is defined under the shade of *Artavavaha Strotasa* which is having two *Moolasthanas* (site of origin), named *Garbhashaya* (uterus) and *Artavavahi Dhamani* (fallopian tubes). *Garbhashaya* is considered as the seat of an embryo. The fusion of *Shukra* (sperm) with *Shonita* (ovum) and *Atma* (soul) inside *Kukshi* (womb) leads to the formation of *Garbha* (fetus). Here, *Kukshi* means a specific part of the uterus where fertilization

and further implantation occur. Hence, in the context of conception, the *Kshetra* (site) for implantation of a fertilized ovum is the bed of endometrium.

The innermost lining is the bed of fertilized ovum. Hence, the concept of endometrium in *Ayurveda* can be understood by the term *Kshetra*. The concept of “*Naveena Raja Sthapana*” (formation of menstrual blood) every month in *Garbhashaya* denotes the proper formation of endometrium in the uterus. *Artava* is *Upadhatu* (by product) of *Rasa*, but it works as *Dhatu* by providing “*Dharana*” (implantation) and “*Poshana*” (nutrition) to the embryo during conception.^[14]

Effect of therapy on menstrual cycle

In *Ayurveda*, diagnosis of the *Artavadushti* (menstrual abnormalities) and *Yonivyapada* (gynaecological disorders) is mainly focused on the color, texture, regularity, and quantity of the *Rajah* (menstrual blood). Thus, improvement seen in these parameters indicates improvement in the functions of the female reproductive system. Here, due to the administration of *Madhura* (sweet), *Tikta Rasa* (bitter), *Balya* (strengthening), *Garbhakrit* (responsible for conception), and *Rasayana* (rejuvenating) drugs, irregularities and pain in the menstrual cycle which are primarily caused by *Vata* is reduced, and marked improvement is seen in the subjective parameters. Thus, improvement seen in these parameters indicates improvement in the functions of the female reproductive system.

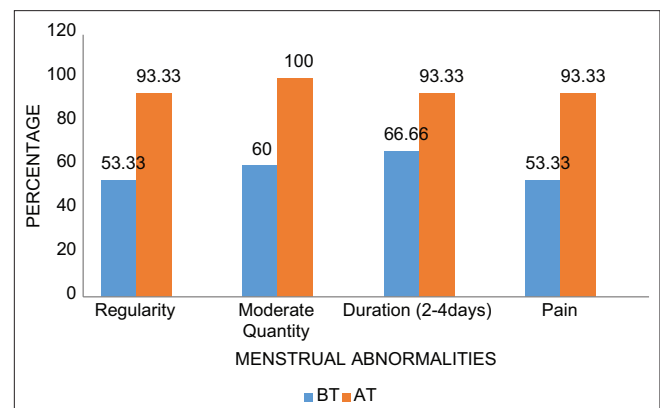
Effect of therapy on apple Baum's uterine scoring system for reproduction: Endometrial thickness

Endometrium thickness depends on *Rasa Dhatu*. *Madhura Rasa* (sweet taste), *Brimhana* (nourishing), and

Table 7: Effect of therapy on menstrual cycle

Parameter	BT, n (%)	AT, n (%)	Percentage relief
Regularity	8 (53.33)	14 (93.33)	40.00
Quantity	9 (60.00)	15 (100.00)	40.00
Duration	10 (66.66)	14 (93.33)	26.67
Painless	8 (53.33)	14 (93.33)	40.00

BT: Before treatment, AT: After treatment, n: Number of subjects



Graph 5: Effect of therapy on menstrual cycle (n = 15)

Table 8: Effect of therapy on menstrual cycle (Wilcoxon sign-rank sum test)

Parameter (n=15)	Mean score		SD (±)	SE (±)	W	P	Significance
	BT	AT					
Regularity	0.53	0.93	0.50	0.13	-21	<0.05	Significance
Quantity	0.53	0.93	0.50	0.13	-21	<0.05	Significance
Duration	0.66	0.93	0.45	0.11	-10	>0.05	IS
Pain	0.50	0.92	0.51	0.13	-21	<0.05	Significance

BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, n: Number of subjects, IS: Insignificant

Balya (strength) action help for the formation and proliferation of endometrium tissues. *Shatavari* (*A. racemosus* Willd.) and *Vidarimula* (*Pueraria tuberosa* DC) have estrogenic properties which enhance the proliferation of the endometrium.

Endometrial layering

Lepana Karma (coating) is the primary function of *Mamsa Dhatu* (muscle tissue) in the body.^[11] With the principle of “*Samanyam Vriddhi Karanam*” (theory of increase by similar and decrease by dissimilar), drugs like *Nagakesara* (*Mesua ferrea* Linn.), *Yashtimadhu* (*Glycyrrhiza glabra* Linn.), *Atibala* (*Abutilon indicum* Linn.), *Atmagupta* (*Mucuna pruriens* Bek.) having similar properties of that of *Mamsa Dhatu* (muscle tissue) i.e., *Guru* (heavy), *Snigdha* (unctuousness), *Balya* (strength), help for proliferation and enhancing the layering of the endometrium. Myometrial echogenicity-Echogenicity is higher when the surface is dense. It can be correlated with the *Prithvi Mahabhuta* (earth component) and *Jala Mahabhuta* (water component) in the body. “*Sthairya* (stability)” and “*Dharana*” (resistance) are the two chief functions of *Parthiva Dravya*. Most of the drugs in the study have *Madhura Rasa* and *Madhura Vipaka* which is composed of *Prithvi* and *Jala Mahabhuta*. Thus, the trial drugs helped in increasing myometrial echogenicity. Uterine artery Doppler flow-*Vahana* of *Artava* (transfer of ovum) to *Garbhashaya* (uterus) is the function of *Artavavahi Dhamani*. *Tikta Rasa* (bitter taste) and *Ushna Virya* (hot potency) of a few drugs reduce *Sanga* (obstruction) and help in an obstruction free flow of blood into the uterine vessels. *Ushna Guna* (hot property) performs the actions of vasodilatation and muscle relaxation. Drugs administered through the vaginal route, i.e., *Yoni Pichu* enhance the absorption of the drugs, which helps in increasing the vascularity of uterine tissues ultimately increasing the uterine artery Doppler flow. Endometrial

blood flow in zone 3-“*Sukshma Kesha Pratikasha*” (minute blood vessels) is the description regarding the *Beeja Rakta Vaha Sira* (blood vessels in endometrium) which carries *Raja* (menstrual blood) to the *Garbhashaya* (uterus), *Tikta Rasa* helps for *Rasa Dhatu Pachana* and *Prasadana* (improves metabolism), thus proper formation of *Upadhatu* (by product of *Dhatu*) i.e., *Raja* formation. Drugs administered through the vaginal route include *Matulunga* (*C. medica* Linn) and *Nagakesara* (*M. ferrea* Linn.), these drugs have *Ishat Ushna Guna* (slight hot potency), because of which it acts as *Garbhashaya-Uttejaka* (uterine stimulator) and increases blood flow in the capillaries. [Figures 1 and 2].

Phytoestrogenic drugs shows action on both the uterus and the vagina. Effect on the uterus includes increases vascularity along with hyperplasia of uterine tissues. Hyperplasia results in an increase in surface area for absorption. It brings about cyclic changes, i.e., regression and proliferation in the uterus. Effect on vagina includes increase in vascularity, thus helps to improve the permeability of administered drugs. It enhances the absorption of epithelial cells.^[15] Thus, the drugs administered through the oral route and the vaginal route work together for the improvement of endometrium thickness, vascularity, and receptivity.

Effect of therapy on ovulation

This action is mainly due to *Tikta* (bitter taste) and *Madhura Rasa* (sweet taste) of the *Jeevaniya Churna*. *Tikta Rasa* helps for *Amapachana* (digestion) and *Srotas Shodhana* (clearing of channels), while *Madhura Rasa* has actions like proliferation and development of follicles. The drugs act by regulating the GnRH pulsatile release of hormones and Hypothalamus – Pituitary-Ovarian (HPO) axis regulation while ultimately resulting in ovulation.

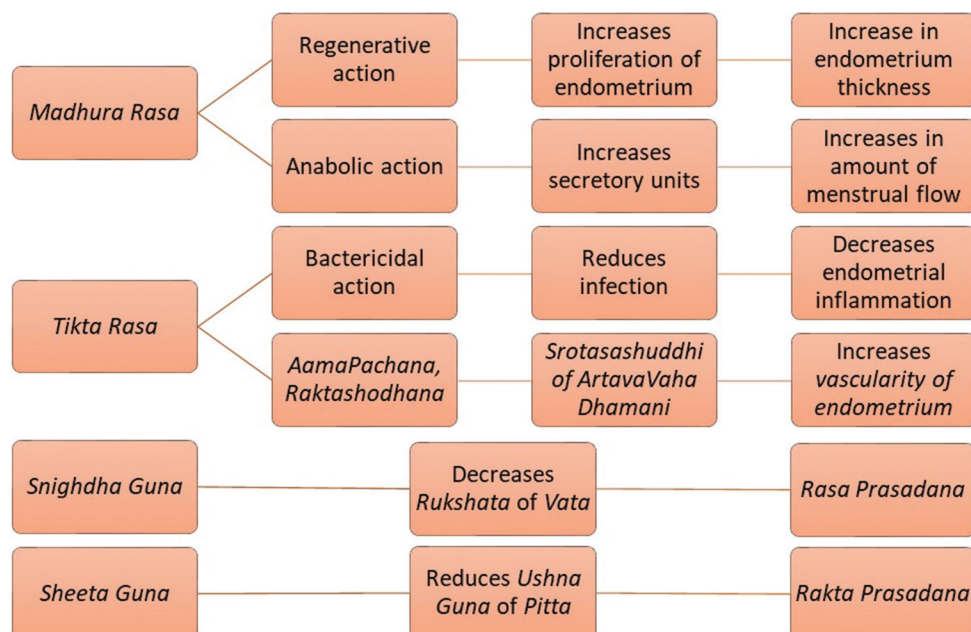


Figure 1: Mode of action of *Jeevaniya Churna*

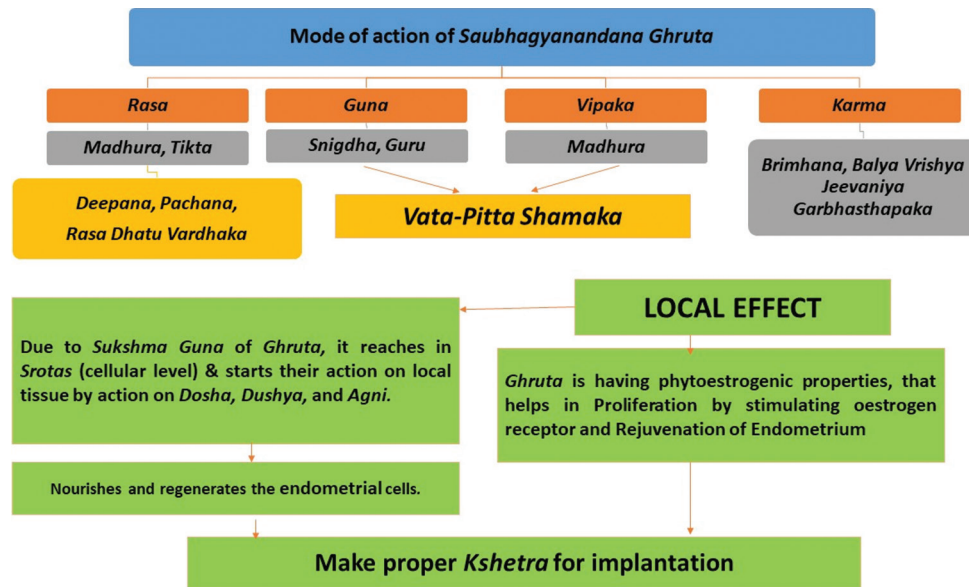


Figure 2: Mode of action of *Saubhagyanandana Ghruta*

Effect of therapy on conception

In the conceived patient, all the factors required for fertility, i.e., ovulatory factor, tubal factor, and male factor were normal except poor endometrial thickness, i.e., <7 mm. After enrolling the patient in the study, patients' ET increased from 6 mm to 9.2 mm, and the patient conceived in the follow-up period, i.e., within 1 month of the study.

Conclusion

Saubhagyanandana Ghruta Yonipichu (vaginal tampon) and *Jeevaniya Churna* orally showed highly significant results in the parameters of Applebaum USSR score such as endometrial thickness (mm), endometrial layering, myometrial echogenicity, uterine artery Doppler flow (PI), endometrial blood flow in zone three. Significant result was found on the menstrual abnormalities such as irregularity, quantity, duration, and pain. Thus, it can be concluded that the management protocol, i.e., *Saubhagyanandana Ghruta Yonipichu* (vaginal tampon) and *Jeevaniya Churna* orally is effective in the management of thin endometrium thickness.

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Conflicts of interest

There are no conflicts of interest.

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