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Comparative clinical evaluation of *Jeevantyadi Yamaka Matra Basti* and *Uttara Basti* in *Bandhyatva* (Anovulation)

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ABSTRACT

Introduction: Infertility is presently a leading and longstanding gynaecological issue affecting approximately 15% of the couples in reproductive age group around the globe while 10-15% in Indian population. Ovulatory dysfunctions form the major cause of female infertility, out of which Anovulation accounts for 40%. Anovulation can be interpreted as *Abeejotsarga* or *Abeejata*. *Panchakarma* plays an important role in the management of Infertility. Thus, the present study aimed at evaluating the ovulation inducing effect of *Jeevantyadi Yamaka* through *Matra Basti* and *Uttara Basti*. **Methodology:** The study was conducted on 40 female subjects, diagnosed of anovulation with either primary or secondary infertility, fulfilling the inclusion and exclusion criteria and were randomly allocated into two groups with 20 subjects in each. But only 33 patients completed the trial with 18 patients in Group A and 15 patients in Group B. Group A received *Jeevantyadi Yamaka Matra Basti* while Group B were administered with *Jeevantyadi Yamaka Uttara Basti* for a period of three menstrual cycles. The assessment of results was done by follicular study conducted from 9th day of menstrual cycle till 20th day of every cycle for consecutive three cycles. **Results:** Both the groups showed significant improvement in assessment parameters. Although the number of patients were less in Group B than Group A but Ovulation was observed in 5.5% of subjects in Group A and 40% of subjects in Group B. **Discussion:** *Jeevantyadi Yamaka Matra Basti* and *Uttara Basti* both are equally effective in increasing the size of follicles and other assessment parameters. But in overall, *Jeevantyadi Yamaka Uttara Basti* was more effective in achieving Ovulation due to its local effect. As, this study was only for three months so no result was seen on Conception.

Key words: *Bandhyatva, Infertility, Anovulation, Uttara Basti, Matra Basti, Jeevantyadi Yamaka.*

INTRODUCTION

According to WHO, Infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.^[1] It affects approximately 10-15% of reproductive couples. The

WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 percent.^[2] According to International Federation of Gynaecology and Obstetrics (FIGO) manual, ovarian factor contributes 15-25% in causes of the female infertility.^[3] So, it is the second common cause of infertility. Ovulatory cause is an important subset in infertility among women, accounting about 40% of cases. (Infertility of Leon Sperrof et.al).^[4] Anovulatory or inability to produce a fertile ovum is an important cause among the women for infertility. In modern science there is treatment of infertility (due to anovulation) which includes usage of Ovulation induction by Human Menopausal Gonadotrophins (HMG) Injections, Gonadotrophins, Clomiphene Citrate etc. but they have unsatisfactory results, enormous expenses and lots of side effects like ovarian hyper stimulation, frequent abortion, multiple gestations, and major long-time possibility of ovarian cancer. In this Particular disease, treatment which improves

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quality of life with nil or minimal side effects is the need of hour.

In *Ayurveda*, *Bandhya* can be defined as the cessation of *Artava*.^[5] According to *Ayurveda*, Fertility of women depends on the healthy states of *Ritu* (appropriate time), *Kshetra* (healthy Uterus and passage), *Ambu* (proper nutrition of mother) and *Beeja* (healthy ovum and sperm).^[6] Imperfection in any one of them leads to *Bandhyatva* (Infertility). Among them *Beeja* is the core stone of the female reproductive process and in its absence *Garbha*- Fetus cannot be formed in spite of all the other factors. Here the *Beeja* is taken as *Antahpushpa*^[7] i.e., ovum. So, anovulation can be included under *Beeja Dushti*.

Vata is considered to be the root cause of all the disorders cognate to the female reproductive system including female infertility. Without *Vata*, the *Yoni* (Female genital organs) never gets spoiled. Moreover, the most important functions of *Vayu* are *Vibhajana* and *Pravartana*. Because of *Vibhajana*, Ovum is prepared in the ovary by cell division and because of *Pravartana* Ovulation takes place. This function of cell division to form ovum is completed by *Vata*. The whole activity is known as *Dhatu Vyuha Kara* i.e., it places every *Dhatu* at its proper place, which is also an important function of *Vata*. The process of *Pravartana* is governed by *Apana Vayu*.^[8] Therefore, we can say that ovulation is under the control of *Vata*. Therefore, any vitiation of *Apana Vata* will affect the ovulation. In this aspect, *Basti* is considered to be the best treatment for *Vata*. *Basti* cures all the disease of *Vata*.^[9] So, it may act on anovulation by normalising the pelvic reproductive physiology. In *Ayurveda*, Anovulation refers to *Abeejotsarga*. The Term *Utsarga* means to expel or to leave. So, Expulsion of matured ovum from the *Beejagranthi* means *Beejotsarga*. As *Utsarga* is *Karma* of *Vata* so vitiation of *Apana Vata Dosh* causes *Abeejotsarga*. *Abeejotsarga* is symptom as well as a disease caused due to vitiation of *Vata* and *Kapha Dosh* as they do *Marga-Avarodha to Artavaha Strotas* leading to *Abeejotsarga*.^[10]

Acharya Vagbhata has mentioned *Jeevantyadi Yamaka Anuvastana Basti* for *Bandhyatva*.^[11] *Yamaka* is

a combination of *Ghrita* and *Taila* which itself is *Vata Shamaka* and *Taila* is also mentioned as *Yonivishodhaka*. Moreover, all the contents of *Jeevantyadi Yamaka* are *Vata Shamaka* mostly with *Laghu, Ushna, Tikshna* property like *Satapushpa, Shati, Vacha*, and most of them like *Jeevanti, Sauf, Vacha, Karkatashringi, Madan, Pippali* having *Vatanulomaka* property and so it will be probably act on anovulation. According to *Acharya Kashyapa*, the women having amenorrhea, Scanty menstruation, non-ovulation or useless ovulation (ovum with minimal or absence of capacity of fertilization) should be treated with *Matra Basti*.^[12] In condition of anovulation, *Uttar Basti* removes the *Srotosangha* and corrects the *Artavagni* which regulates the menstrual cycle, thus resulting in ovulation. So here, *Jeevantyadi Yamaka* for *Matra Basti* and *Uttara Basti* is selected for the study. This study is related to anovulatory cycle so only Females are considered.

AIMS AND OBJECTIVES

1. To find out the efficacy of *Jeevantyadi Yamaka Matra Basti* in Anovulation.
2. To find out the efficacy of *Jeevantyadi Yamaka Uttara Basti* in Anovulation.
3. To compare the efficacy of *Jeevantyadi Yamaka Matra Basti* and *Jeevantyadi Yamaka Uttara Basti* in Anovulation.

MATERIALS AND METHODS

The materials used for this study are categorised under the following three headings -

1. **Literary Sources** - For the present Study, Literary data was collected from *Vedic Scriptures, Ayurvedic Samhitas* and *Sanskrit dictionaries*. Retrospective study of database-books related to modern Science, research studies published in peer-reviewed journals and conference proceedings and various web-sources like *GOOGLE, DHARA* etc. was done for seeking information about related research work.
2. **Drug source** - For the preparation of *Jeevantyadi Yamaka*, Raw drug was collected from Herbal

Automation, Haridwar and prepared in pharmacy of Himalayiya Ayurvedic Medical College and Hospital, Dehradun.

Plan of Study

1. Selection of Patient
2. Research design
3. Assessment

Selection of Patients

In total, 50 female patients were screened on the basis of signs and symptoms showing classical features of the *Bandhyatva* due to Anovulation in the OPD and IPD of P.G. Department of *Panchakarma* and Department of *Stree Rog and Prasuti Tantra*, Himalayiya Ayurvedic (P.G) Medical College and Hospital, Dehradun. Total 40 patients were enrolled irrespective of religion, socio-economic conditions, etc. Enrolled patients were randomly divided into 2 groups, 20 patients were registered in each group with detailed clinical study, physical examination and investigation in a special proforma.

Research Design

- **Study design** - Randomized Clinical Comparative Trial
- **Masking** - Open type (As Masking was not possible with *Panchakarma* procedure)
- **Randomization** - The patients were randomised using Computer generated randomization.
- **Sample Size and Grouping:** 40 patients of *Bandhyatva* due to Anovulation were randomly selected and equally divided into 2 groups.
 - Group A: 20 patients received *Matra Basti* with *Jeevantyadi Yamaka*.
 - Group B: 20 patients received *Uttara Basti* with *Jeevantyadi Yamaka*
- **Level of Study:** OPD and IPD level
- **Period of Study:** 18 Months
- **Duration of Treatment:** 3 Months

- **Ethical committee Clearance (Reference No.)** - As this is a clinical study, Institutional Ethical Committee (IEC) approval was taken in prior to initiation of the study with the Reference no. - HAMC/2021/968
- **CTRI Registration** - This clinical study was registered in Clinical Trial Registry of India (CTRI) with the registration no. CTRI/2022/09/045244

Inclusion Criteria

- Married Female Patients from 20 - 40 years of age.
- Patients having active married life (minimum 1 year)
- Patients with at least 2 or more consecutive anovulatory cycles in serial Trans Vaginal Sonography.
- Patients with Primary or secondary both types of infertility.
- Patients having anovulatory cycle with or without PCOD.
- Patients who will be ready for consent, necessary investigations and regular follow up.

Exclusion Criteria

- Patients suffering from the disorders of the reproductive tract such as tuberculosis, carcinoma, and congenital deformity of reproductive tract.
- Patients suffering from Systemic diseases like Tuberculosis, Uncontrolled Hypertension and Diabetes Mellitus, Cardiac Disease, Thyroid disease and Hyperprolactinemia, STDs, HIV, HBsAg.
- Patient suffering from fibroids, endometriosis, adenomyosis.
- Infertility associated with other factors like tubal blockage, uterine factors, cervical factors etc.
- Menorrhagia, Metrorrhagia, Dysfunctional Uterine Bleeding (DUB)

Diagnostic Criteria

- Menstrual disturbances -Oligomenorrhoea, Irregular Menses

- Hormonal assessment
- Ultrasonography (USG)
- Follicular study

Withdrawal Criteria

- Any Intercurrent Illness.
- Personal reason.
- If any Side effect occurs

Investigations

- Routine blood and Urine Examination
- Hormonal Profile (S. Prolactin, S. TSH, S. FSH, S. LH, AMH, S. Progesterone)
- USG
- TVS for Follicular Study
- Serological Examination to screen for HIV, HbsAg, HCV, VDRL.
- Human Semen Analysis

Table 1: Showing Method of Intervention

Intervention Name	Group A	Group B
Selected Drugs	<p>For <i>Snehana - Tila Taila</i></p> <p>For <i>Swedana - Nadi Sweda</i> with <i>Dashmoola Kwatha</i></p> <p>For <i>Matra Basti - Jeevantyadi Yamaka</i></p>	<p>For <i>Mridu Virechana - Haritki Churna</i> (3 gm)</p> <p>For <i>Yoni Dhawan - Panchavalkal Kwath</i> (500 ml)</p> <p>For <i>Snehana - Tila Taila</i></p> <p>For <i>Swedana - Nadi Swedana</i> with <i>Dashmoola Kwath</i></p> <p>For <i>Uttara Basti - Jeevantyadi Yamaka</i></p>
Dose of Medicine	60 ml	5 ml

Route of Administration	Rectal Route	Vaginal Route
Procedure		
Purva Karma	<p>Before administration of <i>Basti</i>, Patients were asked to take light meal. Then, <i>Sthanika Abhyanga</i> with <i>Tila Taila</i> and <i>Sthanika Swedana</i> with <i>Dashmoola Kwath</i> were done on the region of <i>Udara, Kati</i> and <i>Prishtha Pradesh</i>.</p>	<p>On each Night Before the <i>Uttara Basti</i> Administration, <i>Haritki Churna</i> in Dose of 3 gm was given in lukewarm water for cleaning the bowels. <i>Sthanika Abhyanga</i> with <i>Tila Taila</i> and <i>Sthanika Swedana</i> with <i>Dashmoola Kwath</i> were done over <i>Udara, Kati</i> and <i>Prishtha Pradesh</i>. All the instruments used during the procedure including the medicine were autoclaved and kept ready. <i>Yoni Prakhshalana</i> was done with <i>Panchavalkal Kwath</i>.</p>
Pradhana Karma	<p>Patients were advised to take left lateral position with left straight and right leg flexed on knee and hip joint and were asked to keep their left hand below the head. Enema nozzle was pushed into rectum after lubricating nozzle and <i>Guda</i>. Then, <i>Jeevantyadi Yamaka Matra Basti</i> was administered slowly in the dose of 60 ml.</p>	<p>The patient is examined for the parameters like BP, pulse, temperature etc. before she is put to table. Then the patient is kept in lithotomy position with the part exposed, cleaned and draped. The part is covered with the ring towel and only the perineum is exposed. Later the lubricated Sim’s speculum is slowly inserted to expose the cervix and held with Allis forceps. After that, Os is dilated using Hegar’s dilators. After dilating the Os, the lubricated IUI cannula is carefully introduced to the</p>

		uterus through the cervix. Then, 5 ml of <i>Jeevantyadi Yamaka</i> is injected gently with the help of disposable syringe of 5 ml attached from the other side of IUI Canula (after removing the air bubble)
Paschat Karma	After the administration of <i>Basti</i> , the patients were advised to lie in supine position with the arms and legs spread out freely over the table. Buttocks of the patient were patted with palms for 3 times and patient was advised to relax in supine position.	Patient was kept in head low position for at least 2 hours for better absorption of drug from vagina and to prevent any vasovagal shock. Abdominal hot fomentation with hot water bag was given. Light diet advised.
Duration	7 Days after cessation of menses for Consecutive 3 months	Consecutive 3 days after cessation of menses for Consecutive 3 months.
Improvement was assessed on 90th day		
Follow up of patients was done on the basis of ovulation study which was done from 9th day onwards till 22nd day depending upon the Ovulation.		

Assessment

The assessment was done on the Subjective parameters and Overall assessment and scoring was done before and after the Treatment.

Table 2: Showing Assessment Criteria with Grading

SN	Subjective Parameter	Severity of Symptoms	Grade
1.	Pain during Menses	No pain	0
		Mild Pain	1

		Moderate Pain	2
		Severe Pain	3
2.	Duration of Menstruation	4 - 5 days	0
		3 days	1
		1 - 2 days	2
		1 day	3
3.	Interval Of Menstruation	21 to 35 days	0
		36 to 45 days	1
		46 to 55 days	2
		More than 55 days	3
4.	Quantity of Bleeding	2-3 pads/day	0
		1-2 pads /day	1
		1 pad/day	2
		No Bleeding / Spotting	3
5.	Follicle Size	Ovulated	0
		>20 mm	1
		12-19 mm	2
		< 12 mm	3
6.	Viscosity of Cervical Mucous	Sticky, Resembles egg white	0
		Mildly Viscous	1
		Intermediate Type	2
		Highly viscous, non-sticky	3

Statistical Analysis

Parameters	Intragroup result	Intergroup comparison
Subjective parameter	Wilcoxon Signed rank test	Mann Whitney U test

RESULT

Effect of Matra Basti (Group A) On Subjective Parameters

(Wilcoxon Signed Rank test)

Ranks							
Variables	N	Mean Rank	Sum of Ranks	Z Value	P Value	Result	
Pain during menses_A T – Pain during menses_BT	Negative Ranks	10 ^a	5.50	55.00	- 2.972 ^b	.003	S*
	Positive Ranks	0 ^b	.00	.00			
	Ties	8 ^c					
	Total	18					
Duration of menses_A T - Duration of menses_B T	Negative Ranks	12 ^d	6.50	78.00	- 3.176 ^b	.001	S*
	Positive Ranks	0 ^e	.00	.00			
	Ties	6 ^f					
	Total	18					
Interval between two cycles_AT – Interval between two cycles_BT	Negative Ranks	12 ^g	6.50	78.00	- 3.145 ^b	.002	S*
	Positive Ranks	0 ^h	.00	.00			
	Ties	6 ⁱ					
	Total	18					
Quantity of bleeding_AT- quantity of bleeding_BT	Negative Ranks	15 ^j	8.00	120.00	- 3.542 ^b	.000	HS**
	Positive Ranks	0 ^k	.00	.00			
	Ties	3 ^l					
	Total	18					

Follicular size_AT-Follicular size_BT	Negative Ranks	11 ^m	6.00	66.00	- 3.127 ^b	.002	S*
	Positive Ranks	0 ⁿ	.00	.00			
	Ties	7 ^o					
	Total	18					
Viscosity of cervical mucous_A T-Viscosity of cervical mucous_B T	Negative Ranks	13 ^p	7.00	91.00	- 3.419 ^b	.001	S*
	Positive Ranks	0 ^q	.00	.00			
	Ties	5 ^r					
	Total	18					

S* - Significant, HS** - Highly significant

Effect of Uttara Basti (Group B) On Subjective Parameters

(Wilcoxon Signed Rank test)

Ranks							
Variables	N	Mean Rank	Sum of Ranks	Z Value	P Value	Result	
Pain during menses_A T - pain during menses_B T	Negative Ranks	9 ^a	5.00	45.00	- 2.739 ^b	.006	S*
	Positive Ranks	0 ^b	.00	.00			
	Ties	6 ^c					
	Total	15					
Duration of menses_A T- duration of	Negative Ranks	11 ^d	6.00	66.00	- 3.002 ^b	.003	S*
	Positive Ranks	0 ^e	.00	.00			

menses_B T	Ties	4 ^f					
	Total	15					
Interval between two cycles_AT - interval between two cycles_BT	Negative Ranks	5 ^g	3.00	15.00	- 2.236 _b	.025	S*
	Positive Ranks	0 ^h	.00	.00			
	Ties	10 ⁱ					
	Total	15					
Quantity of bleeding_ AT- quantity of bleeding_ BT	Negative Ranks	13 ^j	7.00	91.00	- 3.272 _b	.001	S*
	Positive Ranks	0 ^k	.00	.00			
	Ties	2 ^l					
	Total	15					
Follicular size_AT - follicular size_BT	Negative Ranks	14 ^m	7.50	105.00	- 3.384 _b	.001	S*
	Positive Ranks	0 ⁿ	.00	.00			
	Ties	1 ^o					
	Total	15					
Viscosity of cervical mucous_A T- viscosity of cervical mucous_B T	Negative Ranks	13 ^p	7.00	91.00	- 3.247 _b	.001	S*
	Positive Ranks	0 ^q	.00	.00			
	Ties	2 ^r					
	Total	15					

Intergroup comparison in various Subjective parameters of Bandhyatva by Mann Whitney test

Ranks							
Variables	Group	N	Mean Rank	Sum of Ranks	Z Value	P Value	Result
Pain during menses_B T	A	18	15.17	273.00	-1.265	.206	NS*
	B	15	19.20	288.00			
	Total	33					
Pain during menses_A T	A	18	15.75	283.50	-.881	.378	NS*
	B	15	18.50	277.50			
	Total	33					
Duration of menses_B T	A	18	17.42	313.50	-.300	.764	NS*
	B	15	16.50	247.50			
	Total	33					
Duration of menses_A T	A	18	19.31	347.50	-1.702	.089	NS*
	B	15	14.23	213.50			
	Total	33					
Interval between two cycles_BT	A	18	19.39	349.00	-1.664	.096	NS*
	B	15	14.13	212.00			
	Total	33					
Interval between	A	18	19.33	348.00		.071	NS*

S* - Significant

two cycles_AT	B	15	14.20	213.00	-1.807		
	Total	33					
Quantity of bleeding_BT	A	18	17.92	322.50	-.628	.530	NS*
	B	15	15.90	238.50			
	Total	33					
Quantity of bleeding_AT	A	18	19.39	349.00	-1.782	.075	NS*
	B	15	14.13	212.00			
	Total	33					
Follicular size_BT	A	18	17.00	306.00	.000	1.000	NS*
	B	15	17.00	255.00			
	Total	33					
Follicular size_AT	A	18	20.64	371.50	-2.651	.008	S**
	B	15	12.63	189.50			
	Total	33					
Viscosity of cervical mucous_BT	A	18	17.56	316.00	-.451	.652	NS*
	B	15	16.33	245.00			
	Total	33					
Viscosity of cervical mucous_AT	A	18	20.28	365.00	-2.280	.023	S**
	B	15	13.07	196.00			
	Total	33					

NS* - Not Significant, S** - Significant

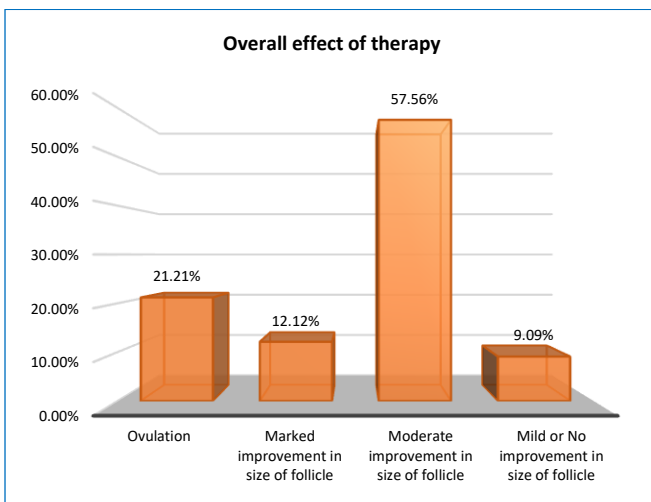
Improvement of Subjective Parameters in Each Group

SN	Subjective parameters	Result in Percentage	
		Group A (in %) (n=18)	Group B (in %) (n=15)
1.	Pain during menses	52.2%	51.6%
2.	Duration of Menses	51.8%	70.6%
3.	Interval between two cycles	64%	76.9%
4.	Quantity of bleeding	62.3%	83.1%
5.	Follicular size	27.2%	59.8%
6.	Viscosity of Cervical mucous	30.5%	53.8%
Average % of relief		48%	65.9%

Overall Effect of Therapy

	Group A		Group B		Overall effect	
	%	N	N	%	N	%
Complete Remission :100% relief (Ovulation)	1	5.6%	6	40%	7	21.21%
Marked Improvement: >75% relief to <99% relief (Increase in size of follicle i.e., 19-23 mm)	1	5.5%	3	20%	4	12.12%
Moderate Improvement: >50% to 74% relief (Increase in size of follicle i.e., 12-19 mm)	14	77.7%	5	33.4%	19	57.56%
Mild Improvement: <25% to >49%	2	11.3%	1	6.6%	3	9.09%

relief (< 12mm size of follicle)						
Total	18	100%	15	100%	33	100%



DISCUSSION

Discussion on Post Treatment (Result)

Effect of Therapy on Pain during menses:

Group A was found with better result with Average % of relief 52.2% and Significant p value ($p > 0.005$). *Matra Basti* stimulates the CNS through ENS and helps to excrete increased prostaglandins which result in activation of HPA Axis and ANS involving the release of neurotransmitters like Serotonin, thus relieves dysmenorrhoea.

Effect of Therapy on Duration of menses:

Group B was found with better result with Average % of relief 70.6% and Significant p value ($p > 0.005$). The Emmenagogue and Fibrolytic action of most of the contents of *Jeevantyadi Yamaka Uttara Basti* may be the responsible factor for the increase of flow days.

Effect of Therapy on Interval between two cycles:

Group B was found with better result with Average % of relief 76.9% and Significant p value ($p > 0.005$). *Ushna, Tikshna, Lekhana, Pachana* etc. properties of contents of *Jeevantyadi Yamaka* increases the *Agneya guna* of *Pitta* which is responsible for decreasing interval. This effect is also supported by *Vatanulomana* property of *Uttara Basti*.

Effect of Therapy on Quantity of bleeding:

Group B was found with better result with Average % of relief 59.8% and Significant p value ($p > 0.005$). *Jeevanti* is Vasodilator, hence the drug when instilled directly into the Uterus in the form of *Uttara Basti*, causes vasodilatation of the spiral arteries in the Uterus thereby increasing the endometrial proliferation hence increases menstrual flow.

Effect of Therapy on Follicular size and Ovulation:

Group B was found with better result with Average % of relief 83.1% and Significant p value ($p > 0.005$). Most of the contents of *Jeevantyadi Yamaka* have *Ushna, Tikshna, Kapha-Vatashamaka, Vatanulomaka, Srotoshodhana, Amapachana, Artava Janana* and *Garbhashaya Sankochaka* property, thus, relieves the *Kapha* which has done *Avarana* of *Apana Vayu* by blocking the *Artavaha Srotasa* and therefore removes the *Margavarodha* leading to *Rajah Pravritti* and *Beeja Nirmana*. *Uttara Basti* causes local uterine contractions which stimulates the ovarian hormone. Ovaries contain receptor which receives the hormone secreted from hypothalamus and pituitary gland, thus regulate the HPO Axis regulating the menstrual cycle with Ovulation. *Uttara Basti* stimulates these receptors so that Maturation of follicles and ovulation occurs in each cycle.

Effect of Therapy on Viscosity of Cervical mucus:

Group B was found with better result with Average % of relief 53.8% and Significant p value ($p > 0.005$). As *Uttara Basti* is a local treatment, the drug is administered locally in the Cervix which is directly absorbed by the cervical epithelium because of the *Sukshma* property of the drug and thus directly acts on Cervical mucus. Due to the *Laghu* and *Ushna Guna* of contents of *Jeevantyadi Yamaka*, it decreases the *Picchilata* of *Kapha* and increases thinness (fluidity) of mucus, thus, the viscosity decreases and hence spinbarkeit increases.

Overall Effect of Therapy

In the present study, in 21.2% of patients Ovulation occurred, 12.1% of patients reported marked improvement in the size of follicles i.e., 19-23 mm,

57.6% of patients reported moderate improvement in the size of follicles i.e., 12-19 mm and 9.1% of patients reported mild improvement or no growth in the size of follicles i.e., <12 mm.

No patient got conceived during and after the trial.

Average % of relief was higher in Group B i.e., 65.9% followed by Group A i.e., 48%.

Overall, Group B had a higher percentage of individuals achieving Ovulation and marked improvement. On the other hand, Group A had a higher percentage of individuals experiencing moderate improvement. Both groups had a relatively small number of individuals showing mild improvement.

Discussion on Drug

Probable mode of action of Jeevantyadi Yamaka

- Jeevantyadi Yamaka contains 16 ingredients i.e., Jeevanti, Madan, Meda, Gorakmundi, Madhuka, Bala, Shatapushpa, Rishibhaka, Pippali, Kaknasa, Shatavari, Kaunch, Ksheerakakoli, Karkatshringi, Shati, Vacha, along with Go dugdha, Moorchita Go ghrita and Tila taila.
- Due to the non-availability of Rishibhaka, Meda and Ksheerakakoli, Pratinidhi dravyas Vidarikanda, Shatavari and Ashwagandha were used which resulted in double quantity of Shatavari and ultimately increased the Rasayana property of the drug.
- Majority of the drugs having Vata-Kapha shamaka, Deepana-Pachana, Vatanulomaka, Vrishya, Rasayana, Shothahara, Balya, Yonidoshahara, Garbhasthapaka properties mostly with Laghu, Ushna, Teekshna guna. These may remove Avarana of Kapha and might have restored the normal functioning of Vata and Follicular development.
- Ingredients like Jeevanti, Madhuyashti, Bala, Ashwagandha, Vidarikanda, Shatavari, Kaknasa, Kaunch have Madhura rasa and qualities like Rasayana, Balya, Brimhana which is responsible for Upchaya (Kapha Dosha) thereby improves the

Endometrial thickness as well as quality of cervical mucous and may increase the muscular strength of Reproductive system

- Some drugs like Shatapushpa, Pippali, Gorakmundi, have Deepana-Pachana and Amadosha nashaka properties so it regulates Jatharagni, Dhatvagni and Bhutagni by the action of Samana Vata which corrects metabolism at cellular lever which result in proper formation of Dhatus and Upadhatus (Artava) and Srotoshodhana by removing Ama.
- By Ushna Virya, Katu Vipaka, Tikta Rasa and Katu Guna of Madan, Gorakmundi, Shatapushpa, Karkatshringi, Shati and Vacha, it clears the Srotosanga and Stimulates the Srotasa, thus making the proper function of Artavagni by which Ovulation may occur and Menstrual cycle is regulated.
- Because of Madhura Vipaka and Sheeta Virya of Jeevanti, Madhuka, Vidari, Kaknasa, Shatavari, Go-Ghrita and Go-Ksheera, it does the Poshana and Brihana of Yoni. Thus, may enhance the follicular growth by increasing the blood supply and regularising the function of Beejotsarga.
- The Emmenagogue and the fibrolytic action of Madana, Shatapushpa, and Shati may be the responsible factor for the increase of flow days.
- Bala, Gorakmundi, Vidari, Kapikacchu, Ashwagandha have Anti-oxidant property which decreases oxidative stress.
- Shatavari is Garbhaposhaka. It nourishes the Uterus and Ovum and prepares the female organ for pregnancy and prevents threatened miscarriage.
- The Hypoglycaemic property of Shatavari and Jeevanti decreases androgen production and stimulates the hepatic production of S.HBG, thus relieving the symptoms of PCOS.
- Shatavari, Shatapushpa, Jeevanti, Bala, Vidari, Kapikacchu, Ashwagandha, Karkatshringi contains

β -Sitosterol (phytoestrogens), the precursor of Estrogen. Due to their Phyto-estrogenic effect increases amount of cervical mucous, spinbarkeit, ferning, motility and density of sperm in cervical mucous. Phyto-estrogenic effect may also help in regulating the HPO axis and thus regulates menstrual cycle and Ovulation.

- Stigmasterol present in *Jeevanti* and *Vidari*, is a precursor of progesterone, acts as intermediate in the biosynthesis of androgens, estrogens, and corticoids.^[13]
- According to Modern Science, *Sneha* is Lipophilic in nature. Thus, it diffuses rapidly across the cell membrane which is also composed of bimolecular lipid matrix and *Sneha* can cross blood brain barrier and act on CNS i.e., Hypothalamus and Pituitary gland and may correct hormonal imbalance. *Ghrita* contains Beta-carotene and Vitamin E which itself are anti-oxidant. *Ghrita* and *Taila* contains cholesterol which is responsible for the synthesis of steroid hormones i.e., Estrogen & Progesterone.
- The Causative factor of *Bandhyatva* is mainly vitiation of *Vata*. *Acharya Charaka* says that all the gynaecological disorders are due to vitiation of *Vata* and maximum drugs of *Jeevantiyadi Yamaka* are having *Vatashamaka* and *Vatanulomaka* actions. By keeping *Doshas* in *Samyavastha*, it may ensure proper functioning of *Dhatu*.
- Thus, we can say that by *Katu* and *Tikta Rasa*, *Laghu*, *Snigdha guna*, *Ushna Veerya*, *Anulomana*, *Deepana* and *Pachana Karma*, *Jeevantiyadi Yamaka* digests the *Ama* at the cellular level and pacify the vitiated *Vata* and *Kapha Dosh*. Due to the *Ama-pachana* and *Kapha-vatashamana*, *Avarana* and *Sanga* of *Vata-Kapha dosha* is removed and *Apana Vayu* get normalised and do its normal function (*Beejotsarga*).

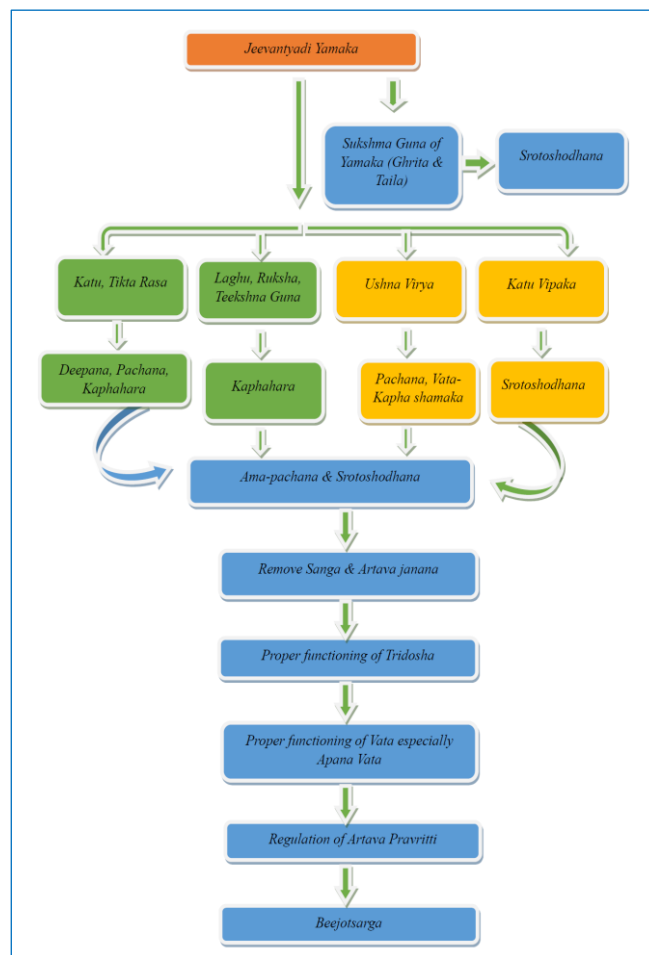
Discussion on probable mode of action of Matra Basti on Ovulation

Mode of action of Purvakarma

Sthanika Abhyanga and *Swedana* prior to *Matra Basti* do its *Anulomana* and thus, *Basti* becomes more efficacious. Besides this, chances of any type of

complication are also less, if *Vatanulomana* is done prior to procedure. Other than it, *Abhyanga* and *Swedana* just prior to *Matra Basti*, relaxes abdominal muscles, increases metabolism and blood circulation because of vasodilation.

Flowchart 1: Showing Mode of Action of Jeevantiyadi Yamaka



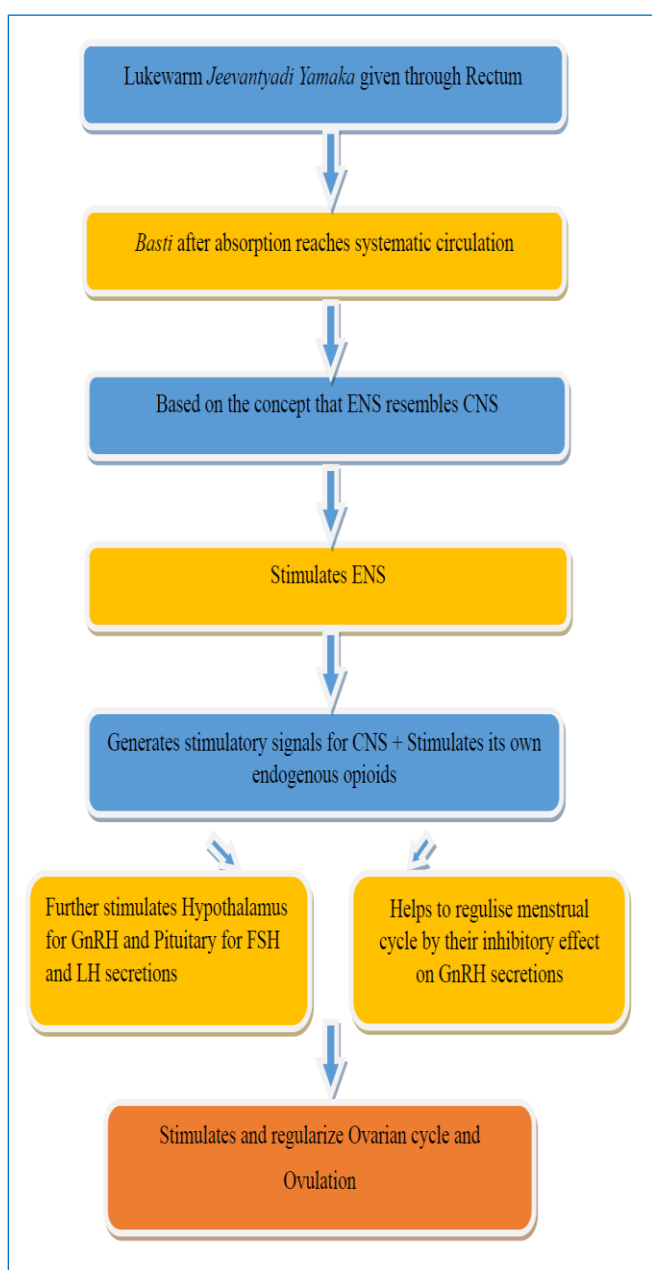
Mode of action of Pradhana Karma

- When lukewarm *Sneha* is given through rectum it reaches instantly into systematic circulation thus has faster absorption and quick results. Mild Temperature of *Sneha* enhances its diffusion.
- ENS controls the motility, exocrine and endocrine secretions and microcirculation of the G.I. tract. ENS closely resembles CNS. Endogenous opioids are mainly present in G.I.T and in Brain (Hypothalamus, Pituitary).
- β endorphin has a role in regulation of normal menstrual cycle. The essence of *Matra Basti*

stimulates endogenous opioids which are usually present in GIT.

- These endogenous opioids (β endorphin) may influence GnRH release and aids to regulate Hypothalamo-pituitary ovarian axis and thus regulates the ovarian cycle.
- Thus, *Matra Basti* stimulates the ENS, generates the stimulatory signals for CNS, causes stimulation of Hypothalamus for GnRH and Pituitary for FSH and LH with the help of Neurotransmitters.

Flowchart 2: Showing Mode of Action of Matra Basti on Ovulation



Probable Mode of Action of Uttara Basti on Ovulation

Probable Mode of action of Purvakarma

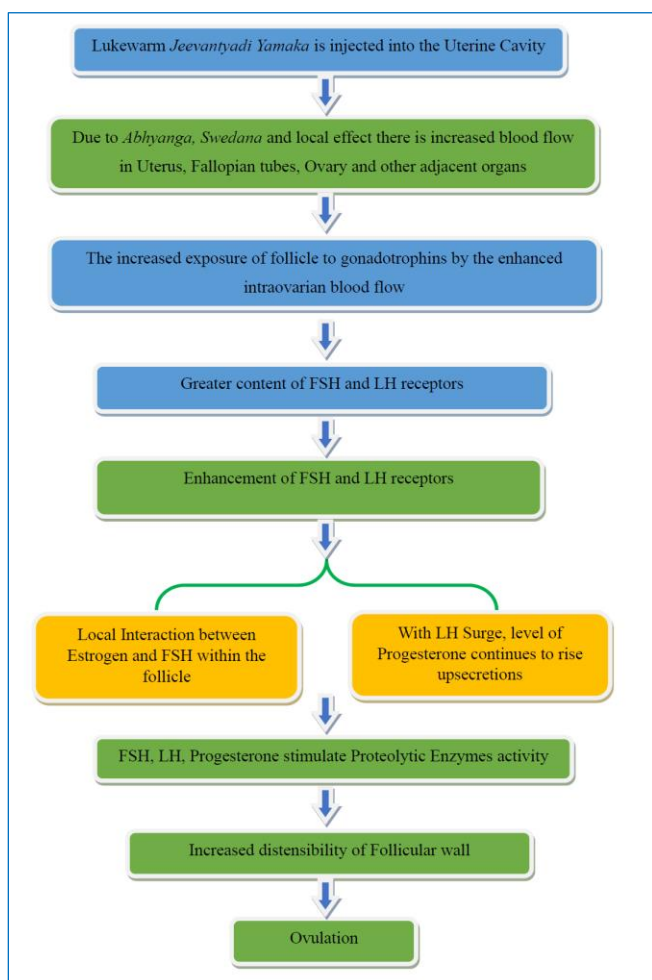
- *Haritaki Churna* given one night prior to *Uttara Basti*, helps to alleviate constipation and thus may be helpful in bringing *Pratimola Apana Vayu* back to normalcy.
- *Sthanika Abhyanga* and *Swedana* prior to *Uttara Basti* do its *Anulomana* and thus, *Uttara Basti* becomes more efficacious. Besides this, chances of any type of complication are also less, if *Vatanulomana* is done prior to procedure. Other than it, *Abhyanga* and *Swedana* just prior to *Uttara Basti*, relaxes abdominal muscles, increases metabolism and blood circulation because of vasodilation.
- *Yoniprakshalana* done prior to *Uttara Basti* with *Panchavalkal Kwatha* nullifies the possibility of any type of infection as a complication.

Probable Mode of action of Pradhana Karma

- When lukewarm *Sneha* enters into the Uterine Cavity, network of *Srotasa* carry the *Sneha* towards the *Artavaha Srotasa*. Mild Temperature of *Sneha* enhances its diffusion.
- *Uttara Basti*, which is given in *Garbhashaya*, i.e., *Artavaha Srotasa* stimulates the *Srotasa* as well as *Beejagranthi*. By the stimulation of Ovary, the *Sanga* in the *Beejagranthi* is removed and *Vata* performs its two functions properly i.e., *Vibhajana* (reduction division in oocyte, proliferation of granulosa cells and responsible for development of follicle along with *Kapha*) and *Pravartana* (rupture of follicle i.e., Ovulation).
- Uterus is the *Mulasthan* of *Artavavaha Srotasa*. The drug directly being instilled in the Uterus gives direct access to the seat of *Sroto vaigunya* and *Dosha-Dushya-Sammurchana* and hence acts on the *Vikrita Vayu* thereby disintegrating the *Samprapti*. In condition of anovulation, *Uttara Basti* removes the *Srotasangha* and corrects the *Artavagni* which regulates the menstrual cycle, thus resulting in ovulation. *Uttara Basti* causes

local uterine contractions which stimulates the ovarian hormone. Ovaries contain receptor which receives the hormone secreted from hypothalamus and pituitary gland, thus regulate the HPO Axis regulating the menstrual cycle with Ovulation. *Uttara Basti* stimulates these receptors so that Maturation of follicles and ovulation occurs in each cycle.

Flowchart 3: Showing Mode of Action of *Uttara Basti* on Ovulation



CONCLUSION

In all the assessment parameters both the treatment modalities i.e., *Jeevantyadi Yamaka Matra Basti* and *Uttara Basti* are equally effective except Follicular size and viscosity of Cervical mucous. But in overall, *Jeevantyadi Yamaka Uttara Basti* was more effective in achieving Ovulation due to its local effect. As, this study was only for three months so no result was seen on Conception.

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