



Review Article

## BASTI - A RAY OF HOPE FOR FEMALE INFERTILITY

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### ABSTRACT

Infertility is the inability to conceive even after one year of regular sex without using birth control. Female infertility is a challenging topic in the society today as it not only leads to distress and depression but also may lead to disturbed family life. Premature ovarian insufficiency, polycystic ovarian syndrome, endometriosis, uterine fibroids and endometrial polyps may play a role in female infertility, ovulatory problems being the most common. Many factors like certain genetic factors, increasing age, improper nutrition, environmental pollution and increasing stress in day to day life may contribute to female infertility. In Ayurvedic literature, infertility has been described under *Bandhyatva*. Treatment offered by Modern Science mainly includes the use of hormonal medicines or injections and Assisted Reproductive Technologies (ART). On the other hand Ayurvedic treatment includes *Nidana Parivarjana* (removal of the cause), Dietary management, *Samshamana* (pacificatory therapy) and *Samshodhana* (purification and cleansing). *Basti* (medicated enema) is one of the most important *Samshodhana* procedures which can be used in the management of female infertility as it not only balances the vitiated *Dosha* (three humours- *Vata, Pitta, Kapha*) but also provides nutrition hence correcting the overall condition of the patient.

### INTRODUCTION

Infertility is the inability of a sexually active couple, not using any birth control, to get pregnant after one year of trying<sup>[1]</sup>. Many couples experience involuntary childlessness for at least one year: estimates range from 12% to 28%<sup>[2]</sup>. About 40% of cases are due to female factors, 30% are due to male factors, 20% are a combination of both, and in about 10% the cause is unknown<sup>[3]</sup>. The most common cause of female infertility is ovulatory problems, which generally manifest themselves by sparse or absent menstrual periods<sup>[4]</sup>. Certain factors like changed lifestyle, nutrition, disease, malformation of uterus, increased stress, age, genetic factors and environmental pollution also contribute to the rise of infertility.

In this modern era, females are becoming more career oriented due to which in most of the cases leads to undue delay in marriage. Advanced maternal age may be a risk factor for infertility<sup>[5]</sup>. It is a social stigma where the female partner is blamed leading to marital disharmony<sup>[6]</sup>.

#### Disease Review Modern

According to the WHO, infertility can be described as the inability to become pregnant, maintain a pregnancy, or carry a pregnancy to live birth<sup>[7]</sup>. A clinical definition of infertility by the WHO and ICMART (The International Committee for Monitoring Assisted Reproductive Technology) 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"<sup>[8]</sup>. Infertility can lead to distress and depression, as well as discrimination and ostracism<sup>[9]</sup>. It can be divided into two types- primary and secondary infertility.

**a) Primary Infertility:** It refers to the inability to give birth either because of not being able to become pregnant, or carry a child to live birth, which may include miscarriage or a stillborn child<sup>[10, 11]</sup>.

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**b) Secondary Infertility:** It refers to the inability to conceive or give birth when there was a previous pregnancy or live birth [10, 11].

**Management** [12]

Depending on the cause it falls into two main categories:

**A) Medications or Surgery**

Fertility drugs (clomiphene citrate or FSH and LH hormone injections) for women with ovulation disorders. These treatments may also be used with an intrauterine sperm injection (IUI), which is when sperm is injected directly into the uterus. Surgery may also be an option when the cause of infertility is blocked fallopian tubes or endometriosis.

**B) Use Assisted Reproductive Technologies (ART)**

These technologies include egg and embryo donation, in vitro fertilization, and intracytoplasmic sperm injection (the direct injection of a sperm into an egg).

**Ayurvedic Review**

In Ayurveda, *Bandhyatva* (infertility) is also an independent disease, rather a cardinal feature of so many diseases. In Sushruta Samhita, *Bandhyatva* has been included in twenty *Yoni Vyapada* (gynaecological disorders). Acharya Charaka and Vagabhatta have referred *Bandhyatva* due to abnormality of *Beejamsa* (gametes). Kasyapa has mentioned *Jataharini* (group of potentially fatal diseases responsible for perinatal death and female infertility) or other *Pushpaghni Jataharini* with repeated expulsion of foetuses of different gestational periods. First time Acharya Harita has classified *Bandhyatva* in detail.

**Classification**

Classification of *Bandhyatva* or *Bandhya* has not been given in any classics except Harita Samhita,

Rasa Ratna Sammurchya and Vandhya Kalpadruma. Harita classified *Bandhyatva* into 6 types [13]:

- *Kakavandhya* (one child sterility)
- *Anapatya* (no child)
- *Garbhasravi* (repeated abortion)
- *Mritavatsa* (repeated stillbirth)
- *Balakshaya* (loss of strength)
- *Vandhya* due to *Balyabastha* (childhood), *Garbhakoshabhanga* (injury to uterus) and *Dhatukshaya* (destruction of tissues)

Rasa Ratna Sammurchya classified *Bandhya* (infertile woman) into nine types- *Adi Bandhya*, *Vataja*, *Pittaja*, *Kaphaja*, *Sannipataja*, *Bhutaja*, *Daivaja*, *Raktaja* and *Abhicharaja*. In *Vandhya Kalpadruma*: eight types of *Bandhya* are described [14].

**Nidana (Aetiology)**

1. *Aharaja Nidana* (improper diet)- *Mithyaahara* (abnormal food habits) [15], *Dushta Bhojana* [16]
2. *Viharaja Nidana* (improper lifestyle)- *Mithyavihara* (abnormal style of living) [17], coitus with *Ruksha* (excessive dryness in body), *Durbala* (weak), *Bala* (female who is not an adult), excessive coitus [18] etc.
3. *Pradusta Artava* (abnormalities in ovum) [19]
4. *Bija Dosha* (abnormalities of sperm or ovum) [20]
5. *Daiva* (unknown or idiopathic factor) [21]

Acharya Sushruta has explained the importance of four factors necessary for conception namely- *Ritu* (season), *Kshetra* (land), *Ambu* (water), *Beeja* (seed). *Ritu* can be compared to ovulatory period, *Kshetra* to female reproductive system, *Ambu* to nutrition and *Beeja* to sperm and ova. Defect in any of the four factors may lead to non-conception [22].

**Table 1: Samprapti Ghataka (Aetiopathogenic Factors)** [23]

<i>Dosha</i>	<i>Tridosha</i> with predominant <i>Vata</i>
<i>Dhatu</i>	<i>Rasa, Rakta</i>
<i>Updhatu</i>	<i>Artava</i>
<i>Srotasa</i>	<i>Artava vaha</i>
<i>Strotodushti</i>	<i>Sanga</i>
<i>Udbhavasthana</i>	<i>Pakvashaya (Mulasthanana of Vata)</i>
<i>Adhishthana</i>	<i>Yoni</i>
<i>Vyadhivabhava</i>	<i>Cirakari</i>
<i>Marga</i>	<i>Abhyantara (Garbhasaya as Kosthanga)</i>

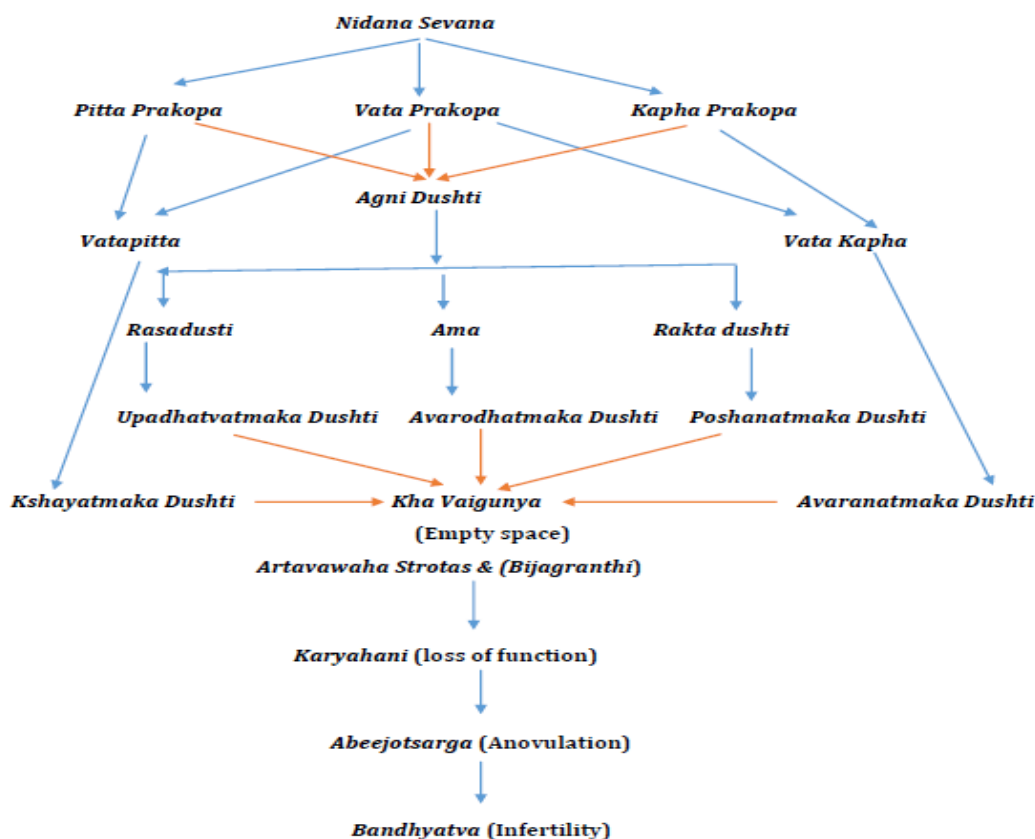


Figure 1: **Samprapti (Pathogenesis)** [24] of **Bandhyatva**

Due to *Nidana Sevana* (causative factors), *Dosha* (three humours- *Vata*, *Pitta*, *Kapha*) and *Agni* (biochemical transformers) get vitiated resulting into *Ama* (un-metabolized food) formation. The *Ama* formed adheres to *Srotasa* (channels) and causes *Avarodhatmaka Dushti* (improper functioning due to obstruction of channels). *Ama* spreads throughout the body, propelled by the vitiated *Vata* along the *Rasavaha Srotasa* (channels carrying the nutritional essence). Due to hypo functioning of *Jatharagni* (gastrointestinal metabolism), *Dhatvagni Mandya* (slow tissue metabolism) also occurs. Due to *Mandagni* (slow digestion) and *Nidana sevana*, *Rasa* (plasma), *Rakta* (blood) *Dhatu* (tissue) get vitiated. Also the *Dhatvagni mandya* causes the *Kshayatmaka* (declining) effect on the *Artava* (ovum) i.e. the production of *Artava*, *Updhatu* (subsidiary or secondary tissue product) of *Rasa dhatu* or *Rakta dhatu* becomes less. Thus it is the *Upadhatvatmaka Dushti* (malfunctioning of secondary tissue products). Visvamitra has clarified that hair thin vessels fill the uterus for whole month to receive *Bija* (ovum) and due to *Rasa dushti*, *Poshanatmaka* (nourishment) *Dushti* can occur. The vitiated *Apanavayu* (one of the five subtypes of *Vata* that governs the elimination of all substances from body e.g. stool, urine etc.) and *Kapha* (one of the three humors of the body which governs structure and fluid balance in the body) when get mix can cause *Avaranatmaka Dushti* (malfunctioning due to

occlusion) [25]. The vitiated *Vata* along with *Pitta* causes the *Artava kshaya* i.e., *Kshayatmaka Dushti*. All these factors may cause *Abeejotsarga* (anovulation) which may lead to infertility [26].

#### Ayurvedic Management

- A) *Nidana Parivarjana*- (Removal of the causative factors like unhealthy diet and lifestyle, smoking, alcohol, stressful environment, environmental pollution etc.
- B) Dietary management- *Ojas* enhancing foods like milk, ghee, nuts, fresh organic fruits, vegetables, proteins etc.
- C) *Samshamana Chikitsa*-
  - *Agni Deepana* and *Ama Pachana*
  - *Vatanulomana*(correcting the functions of *Vata*)
  - Use of herbs like *Ashoka*, *Dashmoola*, *Shatavari* etc.
- D) *Shodhana Chikitsa*- *Snehana* (oleation therapy), *Swedana* (steam therapy), *Vamana* (therapeutic emesis), *Virechana* (therapeutic purgation), *Basti-Anuvasana* and *Nirooha* (enema given through rectal route), *Uttar basti* (enema administered through vaginal route) [27].

## DISCUSSION

Many works have been done on the role of *Basti* in female infertility. Some of them are being mentioned here.

Kamini Dhiman, Shachi Pandya, L.P.Dei, Anup Thakkar and K.S.Dhiman conducted a randomized clinical trial on 11 patients entitled: "Role of *Madhutailik Basti* in Infertility w.s.r. anovulatory factor". *Madhutailik Basti* (rectal enema with honey and oil as main content) was given for 15 days for two consecutive menstrual cycles. They concluded that *Madhutailik Basti* is an effective treatment modality in infertility owing to anovulatory factor<sup>[28]</sup>.

Krupa R. Donga, Shilpa B. Donga and Laxmi Priya Dei conducted a randomized clinical trial on 24 patients entitled "Role of *Nasya* and *Matra Basti* with *Narayana Tail* on Anovulatory factor". Patients were randomly divided into two groups –Group A: (*Narayan tail Nasya* (Errhine therapy) for 7 days for two sittings with gap of 3 days). Group B: (*Narayana tail Matra Basti* (60ml) for 8 days for two sittings).It was concluded that *Matra Basti* (rectal enema in which the smallest amount of oil is administered) group had better results<sup>[29]</sup>.

Another study entitled; "A Clinical Study Of *Kashmaryadi Ghrita Uttar Basti* in Female Infertility" was conducted by Baranwal Deepika and Dave Hetal H. Total 18 patients of female infertility were administered 5ml intrauterine *Kashmaryadi ghrita* after 24 hours of cessation of menses for 3 alternate days for 3 consecutive cycles. *Uttar Basti* was found to be effective in female infertility<sup>[30]</sup>.

Rashmi R. Sharma conducted a clinical trial entitled "*Phalkalyan Ghrita* By Oral Route and *Matra Basti* in the Management of *Alpartava*". 30 patients were randomly divided into 3 groups - Group A - *Phalkalyan Ghrita* [*Matra basti* + Oral], *Matra basti* (60ml/day during Secretary phase for 8 consecutive days + Oral (5gm B.D.) for 2 months. Group B- *Phalkalyan Ghrita* (Oral) 5gm. B.D. for 2 months, Group C- *Rajahpravartini Vati* (Oral) 250mg. B.D for 2 months. *Matra basti* group was found to be most effective in management of *Alpartava* (oligo menorrhea)<sup>[31]</sup>.

Shachi S Pandya conducted a clinical trial entitled-"Role of *Madhutailik Basti* and *Pippalyadi Yoga* in infertility" and randomly divided 33 patients of female infertility into 3 groups. Group A: *Madhutailik Basti* (228 ml for a duration of 15 days after cessation of menses for 2 consecutive cycles). Group B: *Pippalyadi Yoga* (4gm BD before meal orally), Group C- *Madhutailik Basti* + *Pippalyadi Yoga*. It was concluded that *Madhutailik Basti* Group is more effective in comparison to other groups<sup>[32]</sup>.

The above studies clearly show that *Madhutailik Basti* (an alternative of *Nirooha basti*), *Matra basti* and *Uttar basti*, all have been found to be significantly effective in the management of female infertility.

### Mode of action of *Basti* in Female Infertility

*Vata* (one of the three humors responsible for all bodily movements) is mainly responsible for all types of *Yoni Roga* (gynaecological disorders)<sup>[33]</sup>. *Prakruta Vata* (in balanced state) is responsible for the *Beejotsarga* (Ovulation). *Vata* predominance *Tridosha Dusti* is responsible for *Abeejotsarga* (Anovulation). *Basti* eradicates morbid *Vata* from the root along with other *Dosha* and in addition it gives nutrition to the body tissue<sup>[34]</sup>.

### Mode of action of *Basti* given through the genital route (*Uttar Basti*)

In condition of anovulation, *Uttar Basti* removes the *Srotosanga* (obstruction in the channels) and corrects the *Artavagni* (which regulates the menstrual cycle), thus resulting in ovulation. Ovaries contain receptors which receive hormones secreted by hypothalamus and pituitary gland. The drug stimulates these receptors, so that proper ovulation occurs in each cycle<sup>[35]</sup>. In tubal blockage the drug is reaching in bulk to the site of pathology. Hence *Uttar Basti* relieves tubal block by lysis of adhesions and relieves obstruction<sup>[36]</sup>. In cervical factor, drug administered locally in the cervix and absorbed by cervical epithelium due to *Sukshma* (subtle) property of drug. The lipid soluble drug is passively diffused across the membrane in the direction of its concentration gradient. The rate of transport is proportional to lipid: water partition coefficient of the drug. The more lipid soluble, higher is the concentration and quicker diffusion. In this way altered cervical pH can be corrected by *Uttar Basti*<sup>[37]</sup>. *Uttar Basti* helps in endometrial conditions by improving thickness of endometrium, improves the quality of endometrium, helps in curing endometriosis, absorption is very fast gives quicker result<sup>[38]</sup>.

### Mode of action of *Basti* given through the rectal route (*Sneha Basti* and *Madhutailik Basti*)

*Basti* given through the rectal route enters into G.I tract which is considered as Enteric Nervous System. The *Virya* (potency) of *Basti Dravya* (contents of *Basti*) stimulates endogenous opioids which are usually present in G.I. tract. Endogenous opioids are a group of peptides, which play an important role in the ovarian cycle through the inhibitory effect on GnRH secretion. Other pituitary hormones are also modulated by opiates.  $\beta$ -endorphin has been best known opioid related to the reproductive system regulating variety of pituitary hormones including

gonadotrophins. It has a role in the regulation of the normal ovarian cycle<sup>[39]</sup>. *Basti*-stimulates the ENS which generates the stimulatory signal for CNS which in turn causes stimulation of Hypothalamus for GnRH and the Pituitary for FSH & LH with the help of neurotransmitters. Parasympathetic activity is mainly responsible for the *Apana Vayu* activity. *Basti* given through rectum will stimulate this parasympathetic nerve supply which in turn helps for the release of ovum from the follicle in the ovary <sup>[40]</sup>.

**Sneha Basti (Anuvasana Basti or Matra Basti)**

*Sneha Basti* given through *Guda* (rectal route) normalizes *Apana Vayu* leading to *Vatanulomana* and physiological functioning of *Vata*, which may help in turn for the extrusion of ovum from the follicle and ovulation. *Basti Dravya* spreads all over the body, pacifies the aggravated *Dosha* along with *Vyana Vayu* (one of the five subtypes of *Vata* which distributes blood and nutrients to different parts of the body through blood circulation) leads to *Samyaka Rasa*

*Raktadi Dhatu Nirmana* (proper formation of body tissues). *Sukshma Bhaga* (fine part) of *Rasa* reaches the *Bijagranthi* (ovary), which regularizes the *Beejotsarga* (ovulation) with the help of normal *Apana Vayu* <sup>[41]</sup>.

**Madhutailik Basti (an alternative for Nirooha Basti)**

The drugs of *Madhutailika Basti* possess anti-oxidant, Immune-Modulatory etc. properties which may help in relieving the stress, age-decline etc i.e., causes of anovulation. From Ayurvedic point of view, the drugs used in preparation of *Madhutailika Basti* are having properties like *Vrishya* (aphrodisiac), *Vayahsthapana* (which counter aging) etc. *Shatapushpa* which had been used as *Kalka Dravya* (paste), is mentioned in separate *Adhyaya* (chapter) in *Kashyapa Samhita* due to its special properties like *Putrprada* (helps in conception), *Viryakari* (which increases potency of ovum and sperm), *Yoni Shukra Vishodhini* (purifies the reproductive organ in female, sperm and spermatic fluid in male), *Pushpa Prajakari* (increases progeny) <sup>[42]</sup>.

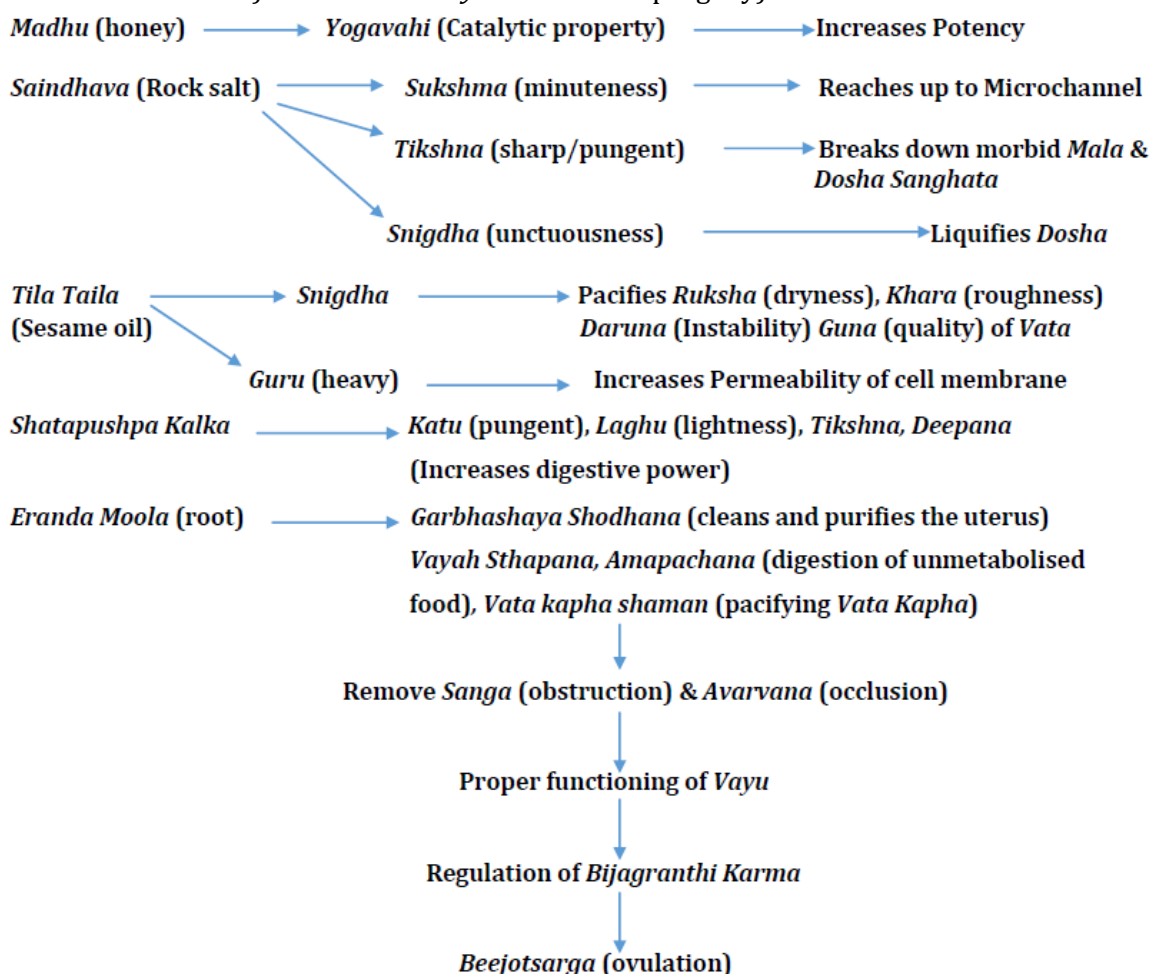


Table 2: Action of various contents of *Madhutailika Basti*<sup>[43]</sup>

The drugs, which are used in preparation of *Madhutailika Basti* helps in regulation of ovulatory cycle through their combine effect hence help in the management of female infertility.

### CONCLUSION

Infertility is a condition which can lead to distress, depression and disturbed family life. It is necessary to cure infertility to enhance the patient's condition as well as to maintain harmony in married life. Thus, *Basti* is an important therapeutic procedure in the management of female infertility and is a boon to individual as well as society.

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