A CASE REPORT ON MANAGEMENT OF FEMALE INFERTILITY DUE TO LOW ANTI MULLERIAN HORMONE WITH AYURVEDIC TREATMENT PROTOCOL

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Abstract

Complex series of events that are inevitable for a successful pregnancy include the formation of healthy sperm and ovum, their development and maturation, ovulation, fertilisation, transportation of fertilised ovum into the uterus, and implantation into a receptive uterine cavity. The recent trend of delaying conception may be associated with declining ovarian reserve, increasing the need for IVF with donor ovum. Anti mullerian Hormone (AMH) is considered a surrogate marker for ovarian reserve and an indicator of healthy ovulation. So the reduced level of AMH is a great concern in the field of infertility management.

Ayurveda emphasizes four main factors viz Rithu (ovulation), Kshetra (functional reproductive organs), Ambu (represents proper nutrition after fertilization, that can be correlated with corpus luteal function up to the establishment of placenta and then onwards placental function), and Beeja (healthy sperm and ovum) which are essential for conception. Infertility due to Diminished ovarian reserve (DOR) can be considered under Dhatukshayajanya Vandhya explained in Harita Samhita.

This case study focuses on a 27 year old female patient who approached came to OPD with complaints of inability to conceive even after 8 years of unprotected sexual life. A thorough history taking revealed that all infertility investigations were normal with the exception of the AMH count, which was found to be reduced.

She was given medications for Agni deepana and Dhatuposhana as well as Panchakarma treatments, including Musthadi Rajayapana Vasti and Uttaravasti. With the above-mentioned treatments for 3 courses, the patient approached our OPD, 2 months after discharge with the complaint of secondary amenorrhea. The urine pregnancy test was found to be positive and the patient was advised for proper antenatal care and timely follow-up. She delivered a full-term healthy female baby on 14.9.23.

Introduction

Infertility implies the failure of a couple to achieve pregnancy after 1 year of ‘unprotected’ and regular intercourse. Infertility is termed primary if conception has never occurred, and secondary if the patient fails to conceive after having achieved a previous conception. Factors such as healthy
spermatozoa, healthy ovum, proper ovulation, patent fallopian tubes, responsive endometrium, and coordinated HPO axis are essential for successful pregnancy outcomes. Among these, the presence of healthy gametes is considered the foremost factor for successful pregnancy outcomes. The ovarian reserve in women is predetermined and it is in a state of depletion with advancing age. Hence ovarian reserve denotes the amount of stock of primordial follicles and the quality of remaining oocytes in the ovaries. AMH is the most recent circulating factor to be analyzed as an ovarian reserve predictor which is expressed by the granulosa cells of small pre-antral follicles, with limited expression in larger follicles (2). It plays a role in dominant follicle recruitment. Low AMH levels may suggest a shortened reproductive window. So the reduced level of AMH is a great concern in the field of infertility management.

*Ayurveda* places focus on four primary components that are crucial for fertility. ie, *Rithu* (ovulation), *Kshetra* (functioning reproductive organs), *Ambu* (represents proper nutrition after fertilization that can be correlated with corpus luteal function unto the establishment of placenta and then onwards placental function), and *Beeja* (healthy sperm and ovum) (3) Infertility is brought on by abnormalities in any one of these elements. In this case, the patient presented with a reduced AMH level which can be considered as *Dhatukshayajanya* Vandhya mentioned in Harita Samhita (4) Vasti chikitsa is important in this case since dhatukshaya is the underlying cause of vatakopa. Apart from this, the treatment protocol focuses on nurturing a healthy ovum and a healthy nidus through *Panchakarma* procedures followed by *Uttara Vasti*.

**PATIENT INFORMATION**

A 27 year old married woman who was eager to conceive after eight years of unprotected sexual intercourse and having a history of molar pregnancy approached OPD to seek treatment for secondary infertility.

Interaction with the patient revealed that she had regular menstrual cycles since menarche with an interval of 26-28 days, duration of 2-7 days with a normal amount of bleeding (2-3 pads/day) associated with mild pain over the left flank. She got married at the age of 19 years in the year 2014 and conceived spontaneously within 3 months, but it was a molar pregnancy and D&E was done in the 3rd month of gestation. In the same year, the couple underwent allopathic treatment and homeopathic treatment, and all necessary investigations such as HSG, and follicular study were done, in which everything was found to be normal. In 2017, IVF was suggested, prior to that, all investigations were repeated, which revealed low AMH value. In 2018 IVF was done but turned out to be a failure. From 2019 to 2021, she went through phases of OP-based Ayurvedic treatment. In 2022 IUI was suggested, prior to that ovulation induction was done. But as the patient was not willing she came here for *Ayurveda* management. Besides haemorrhoids, the patient had no diabetes mellitus, hypertension, or thyroid issues.

**CLINICAL FINDINGS:**

Despite eight years of unprotected sexual activity, the patient complained of being unable to conceive. Her bowels were constipated, her appetite was reduced, her micturition frequency was increased (had a history of UTI) and her sleep was decreased due to stress and worry. Regarding food and medications, she had no allergies of any type. There was no relevant family history. The coital history revealed no abnormalities, and the couple never used any contraceptive methods. Her blood pressure and pulse were found to be within normal ranges. Her height was 149 cm and weight was 48 kg with a BMI of 21.6 kg/m². There was no pallor or oedema. On further examinations, cardio vascular system, respiratory system, and central nervous system were intact. Apart from the reduced level of AMH, all the haematological, and biochemical investigations and semen analyses of the spouse were found to be normal. Per speculum, examination on (21.07.22) revealed a healthy cervix with profuse thick white discharge (+++) without any per vaginal bleeding.

**Treatment history**

2014-17- Allopathic treatment along with homeopathic treatment for 3 months.

2018- IVF- Failed

2019-21 OP level *Ayurveda* treatment

2022 (May) - Ovulation induction, IUI was suggested (but not done)

**Surgical history**

D&E done in 2014

**DIAGNOSTIC ASSESSMENT**

**Investigations**

**HSG (21.06.22)**

Uterine cavity normal in size and shape

Cornua are normal on both sides

Both the fallopian tubes are well opacified up to fimbria and shows free peritoneal spill.

Impression: Normal study.

**YEAR** | **INVESTIGATIONS** | **REMARKS**
---|---|---
2014 | Follicular study | Normal
 | HSG | Normal
 | USG abdomen & pelvis | Normal
2017 | HSG | Normal
 | AMH | Reduced (report missing)
2022 | AMH | 0.262 ng/ml
 | USG-abdomen&pelvis (07.11.22) | Normal study
 | Urine routine(21.11.22) | Epithelial cells - 18-20/hpf
### Spouse factor

**Age:** 33 years  
**Occupation:** Harbour worker  
**Allergy, Addictions:** nil  
**No known history of Chickenpox, Mumps or Varicocele.**  
**Investigations:** Semen analysis (July/2022) – Normal study.

### DIAGNOSIS

Dhatuksahajanya vandhyatwa / secondary infertility due to diminished ovum reserve.

### THERAPEUTIC INTERVENTION

**IP management from 21.07.2022 to 08.08.2022**

<table>
<thead>
<tr>
<th>Date</th>
<th>R. ovary</th>
<th>L. ovary</th>
<th>Endometrium</th>
<th>Cervical canal</th>
<th>POD Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.03.22</td>
<td>Multiple follicles Largest is 21 mm</td>
<td>Multiple follicles Largest is 21 mm</td>
<td>6.0 mm</td>
<td>Normal</td>
<td>Nil</td>
</tr>
<tr>
<td>29.03.22</td>
<td>Largest follicle 21 mm</td>
<td>Largest follicle 24 mm</td>
<td>8.0 mm</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
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<td>-</td>
</tr>
</tbody>
</table>

### Follicular study

<table>
<thead>
<tr>
<th>Date</th>
<th>Complaints</th>
<th>Internal medicines</th>
<th>Kriya krama</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 21.07.22   | Anxious to have a child since 8 years of unprotected sexual life  
Vaiswanara churnam[14] 5gm with honey 6 am & 6 pm, before food.  
Gandharvahasthadi kashayam[8] with Saindhavam (1pinch) -90 ml 6 am before food.  
Udwarthanam with Vara churnam x 3 days |  |
| 22.07.22   | Whitish mucoid discharge per vagina  
Same medicines as above | Vaginal Douche with Thriphala kashayam Day 2  
Udwarthanam with Vara churnam Day 2 |  |
| 23.07.22   | Stoped Maharasnadi kashayam  
Udwarthanam with Vara churnam |  |
| 25.07.22   | All the medicines stopped since snehapan started.  
| 26.07.22   | C/o nauseating feeling while Snehapan  
Thalisadi churnam[14] 5 gm with snehapan X 1 day | Snehapan Day 2 |  |
| 01.08.22   | C/o Gas trouble  
Vaiswanara churnam 5gm with honey twice daily before food for 3 days | Sarvanga Abhyanga with Dhanwantaram Thaila[15] x 3 days  
Ushma sweda x 3 days |  |
| 04.08.22   |  | Virechana with Avipathi churnam[14] 15gm with hot water (6 am morning) | 6 vegas |
| 05.08.22   |  | Yoga Vasti Planned  
SnehaVasti with Phalasarpis (45 ml) & Sukumara gritha (45 ml)  
Kasyavasti with Madhutailika vasti  
First Sneha vasti done | Peyadikrama |
| 06.08.22   | Menstruation started |  |  |
| 07.08.22   |  | Yoga Vasti postponed |  |
| 08.08.22   | Menstruation day 2  
Abhayarishtam[17] 15 ml  
Ashokarishtham[18] 15 ml  
Dhanwantaram gulika[19] – twice daily after food during bleeding phase |  | Discharged |
## 2nd course of IP admission

<table>
<thead>
<tr>
<th>Date</th>
<th>Complaints</th>
<th>Internal medicines</th>
<th>Kriyakrama</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.09.22</td>
<td>Anxious to have a child since 8 years of unprotected sexual life. Menstruation – day 4</td>
<td>Abhayarishtam + Asokarishtam 30 ml twice daily after food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.09.22</td>
<td>Menstruation over</td>
<td>Vicharana snehapana with Phalasarpi 10 ml + Sukumara gritha 10 ml x 2 days</td>
<td>Dhanwantharam thailam for Abhyanga &amp; Ushna jalasnana x 2 days</td>
<td></td>
</tr>
<tr>
<td>01.10.22</td>
<td></td>
<td></td>
<td>Yoga Vasti x 8 days</td>
<td>During days of Kashaya Vasti - internal medicine only at evening time.</td>
</tr>
<tr>
<td>To 08.10.22</td>
<td></td>
<td></td>
<td>Sneha Vasti (on 1/10/22, 2/10/22, 4/10/22, 6/10/22, and 8/10/22) with Phalasarpi 45 ml &amp; Sukumara gritha 45 ml.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Kashaya Vasti 1 &amp; 2</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>(on 3/10/22 and 5/10/22) – Madhuthailaika Vasti: Kashayam- Sapthasaram kashayam [20] - 400 ml</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Sukumaram gritham - 200 ml</td>
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<td></td>
<td></td>
<td>Madhu - 200 ml</td>
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<td></td>
<td></td>
<td></td>
<td>Kaika – Sathapushpa 30 gm</td>
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<td></td>
<td></td>
<td></td>
<td>Saindhavam - 15 gm</td>
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<td></td>
<td></td>
<td></td>
<td>Musthadrajayapana Vasti [21]</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>3rd Kashaya Vasti on (7/10/22)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Gritham- Phalasarpi &amp; Sukumara gritha - 120 ml.</td>
<td></td>
</tr>
<tr>
<td>07.10.22</td>
<td>Whitish mucoid discharge per vagina</td>
<td></td>
<td>Yonipooranam with Phalasarpi x 7 days.</td>
<td>On per speculum examination: Cervix unhealthy, mucoid white discharge.</td>
</tr>
<tr>
<td>08.10.22</td>
<td>Same complaints as above</td>
<td></td>
<td>Yonipooranam with Thriphala kashayam X 3 Days</td>
<td></td>
</tr>
<tr>
<td>10.10.22</td>
<td></td>
<td>Chirivilwadi Kashayam [22] 90 ml before food twice daily</td>
<td></td>
<td>Discharged</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sukumaram gritham 1 tsp twice daily with kashayam</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hinguvachadi gulika [23] 1 gulika twice daily before food</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3rd course of IP admission (19.11.22)

<table>
<thead>
<tr>
<th>Date</th>
<th>Complaints</th>
<th>Internal medicines</th>
<th>Kriya krama</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 19.11.22  | Pain over left side of lower abdomen especially after intake of food | *Nayopayam kashayam*[^1] 90 ml bd  
*Dhanwanthram gulika* 1 gulika twice daily after food | -                                 | -                                 |
| 21.11.22  | c/o abdominal distension                        | *Nayopayam kashayam* 90 ml twice daily before food  
*Dhanwanthram gulika* 1 gulika twice daily after food | Yoga Vasti x 8 days  
*Sneha Vasti* (on 21/11/22, 22/11/22, 24/11/22, 26/11/22 and 28/11/22) with *Phalasarp* 45 ml & *Sukumaram gritha* 45 ml  
*Kashaya Vasti* 1 & 2 on (23/11/22) and (25/11/22) –  
*Madhuthailaika Vasti*:  
*Saptasaram kashayam* -400 ml  
*Sukumaram gritham* - 200 ml  
*Madhu* -200 ml  
*Kaika – Sathapushpa* 30 gm  
*Saindhavam* -15 gm  
*Musthadirajyapana Vasti* -  
3rd *Kashaya Vasti* on 27/11/22  
*Gritham* - Phalasarpis & Sukumara  
*Gritha* 120 ml. | Yoni pooranam with *Phalasarp* x 2 days |
| 24.11.22  | c/o abdominal distension                        | *Nayopayam kashayam* 90 ml twice daily before food  
*Dhanwanthram gulika* 1 gulika twice daily after food  
*Vilwadi lehyam*[^2] ½ tsp twice daily after food | -                                 | -                                 |
| 26.11.22 to 28.11.22 | Pain over left side of lower abdomen especially after intake of food, | *Nayopayam kashayam* 90 ml twice daily before food  
*Dhanwanthram gulika* 1 gulika twice daily after food  
*Vilwadi lehyam*[^2] ½ tsp twice daily after food | Uttaravasti with *Phalasarpis* x 3 Days | -                                 |
| 28.11.22  |                                                | Discharge medicines:  
*Kalasakadi kashayam*[^2] 15 ml with 45 ml luke warm water twice daily before food  
*Dhanwantharam Gulika* 1 gulika with kashaya  
*Dadimadi gritham*[^2] 1 tsp at noon before food | Discharged                         | -                                 |
FOLLOW-UP AND OUTCOME
After using the aforementioned medications for 45 days, the patient came with concerns of missing period and was instructed to do urine pregnancy test on January 15, 2023. The result was found to be positive with LMP on 15.12.2022, EDD by date on 21.09.2023. During her first trimester of pregnancy, regular antenatal care was provided and she was advised to continue visiting for check-ups after that. On 04.05.2023(GA with 14 weeks of pregnancy) patient came with the complaints of constipation, abdominal distension, and bilateral pedal oedema. The Hb report revealed 10 gm/dl.

Medicines given were:
1. **Bahusalaguda**[^28^][^28^]10 gm at bed time.
2. **Punarnavadi kashayam**[^29^][^29^]90 ml twice daily before food
3. **Nayopayam ksheerakashayam**[^30^][^30^]90 ml twice daily before food
4. **Dhanwantharam gulika**[^31^][^31^]1 gulika twice daily after food

Obstetric ultrasounds performed on 9.05.2023 revealed a single intrauterine gestation with a gestational age of 20 weeks and 5 days. Placenta: fundal extending anteriorly and posteriorly, variable presentation. Foetal Heart rate: 144bpm.

DISCUSSION
After thorough history taking and examinations, it was revealed that the patient had secondary infertility caused by low AMH. Since AMH is the accurate predictor of ovarian reserve which measures ovarian primordial follicular pool, any impairment in its normalcy may result in difficulty to conceive.

*Acharya Susrutha* mentioned four crucial requirements for conception to occur which are *Ritu, Kshetra, Ambu* and *Beeja*. *Ritu* indicates the proliferative phase ending with ovulation, *Kshetra* - a healthy female reproductive tract, *Ambu* – nutrients derived from rasadhathu and the *Beeja* denotes a healthy ovum and sperm. *Inadditiontothis Acharya Vagbhata*[^32^][^32^] mentioned *Hridaya* and *Vata* too[^33^][^33^]. *Hridaya* implies a healthy psyche (Soumanasya), and *Vata* is responsible for all the physiological reproductive functions. In common, all *Acharyas* mentioned *Beeja* as an important factor for conception. In this case, the patient had an AMH level of 0.262ng/ml, which could indicate poor ovum quality (Stree Beejam).

From her personal history, it was clear that the patient was affected by *Apana Vata dushti* because she frequently experienced constipation and had a habit of *Vegadharana*, which impairs the body’s physiological functions. *Nidanasevana* like disturbed sleep, stress, and untimely intake of food resulted in the impairment of *Jataragni*. This impairs the digestion and metabolism of *Ahara* due to which this patient showed symptoms like indigestion and bloated abdomen. *Vata pitta dushti* and *Kapha kshaya* resulted leading to improper formation of *Ahara rasa*, ultimately decreasing the quality of *Rasa dhatu*. Since *Artava* is the *Upadhatu of Rasa dhatu*, it will also undergo gradual depletion quantitatively and qualitatively and result in *Vandhyatwa*.

The present disease entity shares a close resemblance to *Dhathukshayajanya Vandhyatwa* in terms of low AMH level attributing to female factor. Here *Vata Dosha* *vikriti* progresses towards *Rasa Dhatukshaya*, thereby affecting *Artava Upadhatu* which was evident from the *Artavakshaya Lakshana* (Beejaroopao&dhaturoopao Artava) of the patient.

The imbalance of *Agni*, which is the primary factor leading to the accumulation of *Ama*, is the root cause of every ailment. Furthermore, the patient’s appetite was diminished. The goal of the therapeutic regimen was to balance the *Doshas* by pacifying the *Vata Dosha* and correcting the *Agni*. When taken orally, *Vaishnavara Churna*, which has *Dipana* and *Pachana karma*, aids in *Agni Vardhana* (improving digestive fire), which in turn corrects *Dhatu Parinama*. Oral administration of *Gandharvahasthadi kashayam* has properties like *Agnideepana*, *Mala sodhana* etc.

*Udwarthana* was done before *Snehapana* for 3 days as an initial *Rookshana*. Considering the unhealthy condition of cervix, vaginal douche was done. *Snehapana* done with *Phalasarpis & Sukumara gritha* imparted a synergistic effect on *Dhatupushhti*. *Virechana* helps in attaining *Agnideepiti* and *Srotovishuddhi* (purification of channels) and hence supports the proper *Dhatuparinama*. According to *Acharya Kashyapa, Virechana* helps the *Beeja* to become efficacious (*Beejam Bhavati karmukam*)[^34^][^34^].

Pathogenesis of gynecological disorders always involves *Vata Dosha*[^35^][^35^]. So, *next Yoga vasti* was planned. *Madhuthailika Vasti* possess both *Dosha nirharana* and *Brimhana* property. Also, it acts as *Vrishya, Balya, Deepana,* and *Brimhana*. *Sapthasaram kashayam* and *Sukumara gritha* were used for Vasti. Mustadirajayapana Vasti is *Vatahara, Deepana, Pachana, Sadhyabolajanana,* and *Vrishya*. The use of *Uttara Vasti* is recommended for all gynaecological conditions, particularly in *Pushpanasa* (ovum destruction).[^36^][^36^]

*UPT results were positive on January 15, 2023,* and a single intrauterine gestational sac with a good FHS was observed on USG on April 9, 2023. She delivered a healthy female baby on 14.9.23.
Conclusion
Reduced AMH level indicating Diminished Ovarian Reserve can be considered under Dhatukshayajanya Vandhya explained in Harita Samhita, which is due to Kshaya of Beejaroopa or Dhaturoopapravatta. It may also indicate unhealthy Beeja. In this case, medications for Agnideepana and Dhatuposhana were given in order to stimulate the ovaries to produce healthy oocytes. Since Dhatukshayajanya Vandhya predominantly involves Prakupita Vata, Panchakarma therapies especially Vasti were administered. Among that, Rajayapana vasti was specifically done since it is directly indicated in Vandhya chikitsa. Special treatments like Uttaravasti was also done in order to improve AMH and fertility. The above mentioned treatments helped the patient to conceive and deliver a healthy female baby on 14.9.23.

PATIENT PERSPECTIVE
The patient shared her perspective in her local (Malayalam) language. Since the patient didn't get the desired results from allopathic treatments and also as she was not willing for the IUI suggested by them, she visited our hospital for ayurvedic management. She was extremely happy and grateful that she had conceived successfully.

INFORMED CONSENT
Informed consent was taken from the patient for the management and for reporting the case.

References
22. Acharya Vagbhat, Ashtanga Hridaya, ChikitsaSthana, Edited by Pt. Hari Sadasiva Shastri Paradakara, Published by: Chaukhamba Sanskrit Sansthan, Varanasi, 14/31-33, Pg-687
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31. PV Tewari. Commentary on Kashyapamitha, Siddhi Sthana, trilakshanasidhirnama Dwitiya adhyaya; chapter 2, verse 7, varnasi; Chaukambhavishvabharati oriental publishers; 2008, 266 p.


