



Case Study

AN AYURVEDIC APPROACH TO IMPROVING ANTI-MULLERIAN HORMONE: ESSENTIAL PREPARATION FOR ASSISTED REPRODUCTIVE TECHNIQUE

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ABSTRACT

Low levels of Anti-Mullerian Hormone (AMH) are often associated with hormonal imbalances that lead to reduced ovarian reserve and infertility. This condition is commonly marked by increased follicle-stimulating hormone (FSH), diminished AMH, and a decreased antral follicle count (AFC), which collectively lower the chances of conception. AMH, produced by granulosa cells within preantral and antral follicles, is a key indicator of ovarian reserve and an important predictor of how the ovaries respond to stimulation. Its strong link to follicle development makes it a valuable tool for assessing fertility potential. Women with low AMH levels undergoing in vitro fertilization (IVF) often experience poor outcomes, and many are left with the option of donor egg IVF as their only choice. Ayurvedic medicine provides holistic treatment options for infertility, by enhancing the body's natural ability to restore hormonal balance, improve ovarian health, and boost oocyte quality, offering hope to those facing fertility challenges. The present case report documents the efficacy of an Ayurvedic treatment protocol in improving the AMH value. The patient had undergone *Shamana* and *Sodhana* therapies and on follow up marked improvement in AMH level was found making her eligible for ART with her own egg.

INTRODUCTION

Infertility is a growing concern worldwide, affecting millions of couples. Although infertility does not physically incapacitate an individual, it has profound psychological and social impacts^[1]. One of the critical factors contributing to infertility is a diminished ovarian reserve, often reflected by low levels of Anti-Mullerian Hormone (AMH). AMH, a glycoprotein produced by granulosa cells in preantral and antral follicles, serves as a reliable biomarker of ovarian reserve. Low AMH levels are closely associated with reduced ovarian function, poor oocyte quality, and limited follicular recruitment, which significantly impact natural conception and the success rates of assisted reproductive techniques (ART) such as in vitro fertilization (IVF).

Even with advancements in ART, women with low AMH face considerable challenges. Poor ovarian response during controlled stimulation often leads to a limited number of retrieved oocytes, diminishing the chances of successful fertilization and implantation. Additionally, compromised oocyte quality further reduces pregnancy rates and increases the likelihood of miscarriage. These factors highlight the critical need for therapeutic interventions that can enhance both the quantity and quality of oocytes, thereby improving ART outcomes.

According to Ayurvedic texts, four essential factors contribute to conception: *Rithu*, *Kshetra*, *Ambu* and *Beeja*, collectively known as *Garbhasambhava samagri*^[2]. Among these, *Beeja* represents the healthy ovum in women, which plays a crucial role in successful conception. In Ayurveda there is no direct reference for infertility due to low level of AMH, but can be almost correlated with *Dhatukshaya Vandhya*, one among the 6 types of *Vandhyas* mentioned by Harita^[3]. This condition arises from the depletion or insufficient formation of *Dhatu*s, particularly *Arthava* and *Sukra Dhatu*, which are vital for reproductive

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health. This deficiency ultimately results in reduced fertility potential, leading to *Anapathyatha*.

Validating the effectiveness of an Ayurvedic treatment protocol in enhancing AMH levels to optimize ovarian stimulation response for IVF is crucial, as it could pave the way for an integrated medical approach. This case report aims to contribute to this exploration.

Case Report

Presenting Complaint

A 32 year old married women with her husband 37 years of age, consulted in OPD with a presenting concern of inability to beget a viable child even after 2 years of unprotected sexual intercourse. She had reports of low AMH levels. And the male factor with normal seminal parameters.

History of Presenting Complaints

The patient attained menarche at 15 years and her cycles were regular with 3-5 days bleeding and 25-28 days interval. She was previously married at 26 years. During her first marriage, she conceived naturally within one month but experienced a miscarriage at 8 weeks due to a small-for-age embryo, followed by medical termination of pregnancy (MTP).

At 29 years of age, she remarried to a non-consanguineous man of 35 years. The subjects were well aware of fertile period. After an year they consulted gynaecologist and investigations were carried out for both partners. Investigations revealed poor ovarian reserve, with low AMH levels, and thyroid dysfunction was also diagnosed. She was prescribed medication for thyroid management. And also, she underwent treatment for infertility and the patient was advised to undergo in vitro fertilization (IVF). However, due to her low AMH levels, the use of a donor egg was recommended for better success rates. The patient was unwilling to proceed with donor egg IVF and sought Ayurvedic management for further intervention.

Personal History

Appetite: Good
 Bowel: Occasionally constipated
 Bladder: Regular
 Sleep: Sound
 Diet: Mixed (mostly vegetarian)
 Daily use of pickles, untimely food intake
 Rasa preferred- *Katu* and *Amla*

Allergy: Dust allergy (sneezing)

Exercise: Moderate

Menstrual History

Age of menarche: 15

Duration: 3 days

Interval: 25-28 days

Bleeding: Moderate

Dysmenorrhea: Present in 1st 2 days of bleeding

Passing of clots: Nil

Per vaginal discharge: Nil

Sexual History

Adequate frequency of vaginal intercourse and the couples are well aware of the fertile period.

Diagnostic Assessment

- Blood routine investigations was done and found to be normal
- TSH - 6.0IU/mL
- USG showed normal anteverted uterus and both ovaries appear to be normal
- AFC - Rt side (2 follicles) and left side 4 follicles on D3
- AMH- 0.68ng/ml

Asthasthana Pareeksha

Nadi	Vata pittam
Mutra	Prakrishtam
Mala	vibadha
Jihwa	Anupaliptham
Shabdham	Spashtam
Sparsham	Ushnam
Druk	Vyaktam
Akriti	Madhyamam

Dasavidha Pareeskha

Prakrithi: Vata pitta

Vikritrhi: Vata pitta

Sara: Madhyama

Samhanana: Madhyama

Pramana: Madhyama

Satmya: *Katu- Amla rasa*

Satva: Madhyama

Aharasakthi: Madhyama

Vyayama sakti: Madhyama

Vaya: Madhyama

Therapeutic Intervention

Treatment Protocol	Medicines used
Deepana pachana	1. <i>Gandharvahastadi kashayam</i> -90ml bd before food at 6am and 6pm 2. <i>Vaiswanara churnam</i> -10g at 11pm and 3pm before food with hot water
Udwarthanam	<i>Kola kulathadi churna</i>

<i>Sneha panam</i>	<i>Sukumara ghritam</i> (progressively increasing the dose from 30ml to 150ml)
<i>Abhyanga and Ooshma sweda</i>	<i>Dhanwantharam thailam</i> in sufficient quantity
<i>Virechana</i>	<i>Sukumarerandam</i> - 25ml in empty stomach morning 6am
<i>Samsarjana & Rest</i>	
<i>Yoga vasthi</i>	1. <i>Sneha vasthi- Satahwadi thailam</i> 75ml 2. <i>Kashaya vasthi- Musthadi rajayapana vasti</i> with <i>Satahwa kalka</i>
<i>Uttara vasthi</i>	1. <i>Phala ghritam</i> -30ml

Follow up

After 3 months, the patient was advised to have a follow-up in the OPD with a reassessment of AMH value. It was observed that there was a marked improvement in the AMH value to 1.04 ng/ml

DISCUSSION

Anti-Mullerian Hormone (AMH) plays a crucial role in assessing fertility and understanding the underlying causes of infertility. Produced by the granulosa cells of ovarian follicles, AMH serves as a reliable marker of a woman's ovarian reserve, reflecting both the quantity and quality of eggs remaining in her ovaries^[4]. Unlike other hormonal markers, AMH levels remain relatively stable throughout the menstrual cycle, making it a convenient and consistent indicator that can be measured at any time. Low AMH levels are often associated with diminished ovarian reserve (DOR), a condition that can significantly reduce a woman's chances of conceiving naturally. In cases of infertility, measuring AMH provides valuable insights into ovarian function, helps determine the most appropriate course of treatment, such as tailored stimulation protocols in assisted reproductive technologies (ART). By evaluating AMH levels, informed decisions can be taken to optimize outcomes, highlighting the hormone's vital importance in diagnosing and managing infertility.

In Ayurveda this condition has a close similarity with *Dhatukshaya vandhya*, explained by *Harita* that occurs due to depletion of *Dhatu* or due to inadequate formation of *Dhatu*, especially *Arthava* which then leads to *Anapathyatha*.

Samprapti

Improper lifestyle and dietary habits, such as irregular eating patterns (*Vishamasana*), consumption of unhealthy or incompatible foods (*Ahitasana*), and suppression of natural urges (*Vegadharana*), disrupt the balance of the *Doshas*. This leads to an increase in *Vata* and *Pitta* and a decrease in *Kapha*, creating an imbalance that directly affects the *Jatharagni*. When *Jatharagni* becomes irregular (*Vishamagni*), the digestion of food (*Ahara Pachana*) is impaired, resulting in the improper formation of *Ahara Rasa*. This defective process ultimately leads to the production of *Ama*. *Ama* causes *Srotorodha*. This again leads to *Vatavidhi* and *Rasadhatu kshaya*, which in

turn leads *Uttarottara dhatuskhaya* that further causes *Arthavakshaya* and *Ojakshaya*. This finally results in *Dhatuskhaya janya vandhyata* and *Balakshaya*.

Samprapti ghataka

Dosha: Vata (Apana, Samana, Vyana), Pitta

Dhatu: Primarily rasadhatu, then Uttarottara dhatu get affected

Upadhatu: Arthava

Srotas: Rasavaha, Arthavavaha, Sukravaha

Adhishtana: Yoni

Marga: Abhyanthara

Chikitsa

Here the case presents with predominantly *Vata dosha* vitiation, which is progressing as *Dhatukshaya avastha*, which further led to *Arthavakshaya*^[5] that is evidenced in the form of low AMH. So treatment aimed at *Shamana* of *Vata dosha* along with *Agnideepanam*, *Srotosodhanam* and *Dhatuposhanam*. *Gandharvahastadi kashayam* helps in *Vatanulomana* along with it improves *agni* by its *Deepana Pachana* action. It is also *Srotosodhaka*. *Vaiswanara churna* having *Deepana pachana* properties cause *Agni vardhana*, that can correct *Dhatu parinama*. *Udwarthana* was done before *Snehapana* for initial *Rookshana*. *Snehapana* done as *Sapta dhatu* are formed from the essence of *Sneha*. *Sukumaram ghritam* possesses *Rasayana* properties, which have a significant impact on the reproductive organs and nourish *Sukradhatu*. *Rasayana* rejuvenates the entire body, enhancing natural immunity and improving resistance to infections. It optimizes the nutritional value of the *Rasa* which, which in turn aids in the development of the highest qualities of *Dhatu* and *Upadhatu*, such as *Arthava*, thus promoting fertility and addressing *Vandhyatwa*. *Virechana* is beneficial for *Vata Dosha* along with *Pitta* and *Pitta Sansargaja Doshas*^[6]. Acharya Sushruta told that it causes normalcy of *Agni*, it bring back the vitiated *Dhatu* to its normal state, causes clarity of intellect and strength in sense organs^[7]. Kashyapa told that by use of purgation the *Indriyas* get clarified, *Dhatu* get cleansed and the *Beeja* becomes efficacious^[8]. Pathogenesis of gynecological disorders always involves *Vata Dosha*^[9]. Hence, *Basti Karma*, which is the best therapy for *Vata Shamana*, was administered

after *Mrdu Shodhana*. In Ayurveda, *Mustadiyapana Basti*^[10] is particularly recommended as a superior therapy for *Vrishya karma*. Its *Balya*, *Rasayana* and *Garbhāsaya sodhana* properties can influence AMH level, promoting overall reproductive health and vitality. *Uttaravasti* is done with *Phalaghritam*. It is indicated for women to achieve conception and curing genital tract disorders. It is *Vatahara*, *Balya*, *Brimhaniya*, *Garbhada* and *Rasayana* thus helps in nourishment. It also helps in proper development of endometrium, follicles result in healthy progeny. As the drug administered as *Uttaravasti*, there is enhanced absorption of drugs that facilitates the drug's action through the endometrium, after which it enters the internal iliac vein and reaches the systemic circulation. It positively influences the hypothalamo-pituitary-ovarian axis, aiding in the development of primordial follicles under the regulation of FSH and helping to regulate the function of other hormones. Significant improvement in the symptoms of *Artavaksaya* was observed following the *Shodhana Karma*. The AMH levels showed a marked increase after treatment, reaching a satisfactory level, which ultimately made the option of egg donation IVF unnecessary.

CONCLUSION

The Ayurvedic treatment protocol, incorporating a combination of *Shamana* and *Shodhana* therapies, was found to be effective in significantly improving the AMH levels to a satisfactory range. This advancement in AMH allowed the patient to pursue IVF treatment using her own eggs, a possibility that was previously unattainable due to low AMH levels. This highlights the potential of Ayurvedic therapies in enhancing fertility and supporting reproductive health, offering an alternative approach to assist patients facing challenges in conception.

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