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LOW AMH AND AYURVEDA: A CASE STUDY

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ABSTRACT

A potential indicator of ovarian reserve, anti-Mullerian hormone (AMH) is produced by granulosa cells of preantral and antral follicles. The "egg reserve" or "ovarian reserve" of a woman is indicated by her AMH values. In other words, the amount of AMH in the blood can help medical professionals determine how many follicles are present in the ovaries. It can be used to forecast the ovarian reaction to controlled ovarian stimulation. With a low AMH, a woman having in vitro fertilization (IVF) has a poor success rate, leaving the couple with only choice to try IVF using donor eggs. AMH's clinical application has lately been expanded upon. AMH has been studied for its potential applications in the diagnosis of polycystic ovary syndrome, the prediction of the beginning of menopause, and the evaluation of ovarian function prior to and following gynaecological procedures or the administration of gonadotoxic medications like chemotherapy. *Artavadhusti* can be compared with insufficient AMH levels. The current case study provides evidence of the effectiveness of an Ayurvedic therapy regimen in raising the AMH value, a requirement for preganancy.31-year-old female patient came with low AMH report and ultra sound showing low AFC. The patient was given an Ayurvedic management regimen, for 4 months which included herbal drugs only like *Hingavastak churna*, *Pushpadhanwa rasa*, combination of *shatvari* and *shatpushpa* and *phalghruta*. Three months were spent on the follow-up. After that, the AMH level showed a noticeable increase and, in that month, only patient conceive naturally.

KEYWORDS: AMH, low AFC, Ayurveda, Infertility, *Vandhyatwa.*

INTRODUCTION

Despite not being a physically disabling condition, infertility has significant psychological and social repercussions. Anti-Müllerian hormone (AMH), a peptide growth factor of the transforming growth factor-β family[1], is well known for its role in sexual differentiation.

AMH expression continues to increase until primordial follicles have developed into small antral follicles approximately 4–6 mm in size. As the pool of small growing follicles is in parallel with the total number of primordial follicles, AMH reflects ovarian reserve during the early follicular phase, the antral follicle count (AFC) and AMH levels are correlated. Unlike other biomarkers for ovarian reserve, such as FSH and inhibin B, AMH levels fluctuate minor during normal menstrual cycles. The ovarian response at the moment of oocyte retrieval, which ultimately has an impact on the ovarian reserve, plays a significant role in the success rates of in vitro fertilisation (IVF) techniques. The quantity and calibre of the eggs still present in the ovaries are referred to as the "ovarian reserve." The granulosa cells of preantral and antral follicles produce anti-Mullerian hormone (AMH), a hopeful indicator of ovarian reserve. Following synthesis, AMH is discharged into the bloodstream from the after being produced, As the best endocrine marker for determining age-related ovarian pool decline in healthy women.

The clinical symptoms seen in the current case report are similar to those of *aratvadhusti*, which has been previously explained in Ayurveda. The role of four components that aid in conception in Ayurvedic texts are *Rithu, Kshetra, Ambu,* and *Beeja*; they are referred to as *Garbhasambhavasamagri*. The term "*beeja*" refers to a female's healthy ovum, which is crucial component of conception. Additionally, Ayurveda supports the theoretical framework of the age-related progressive degradation of the *artava* is comparable to the female reproductive component. A combined Ayurvedic treatment made up of therapeutic techniques as well as regenerative medications can be quite helpful in raising the reserve of ovarian tissue with bio purification and regrowth of the reproductive organs.

Informed Consent

The consent was obtained from patient prior to initiation of treatment by explaining all the treatment with advantages and disadvantages.

CASE REPORT

The 31-year-old female patient came to the Aaddya ayurved clinic for an ayurvedic treatment for primary infertility having known diagnosis of low levels of AMH and diminished ovarian reserve.

Chief complaints: failure to conceive even after 4 years of marriage. Patient also undergone IUI for one time before 3 months of visit.

Present History

The patient was married since last 4 years. Couple was planning for child since last 3 years. Menstrual history of patient was absolutely normal in terms of flow, duration and cycle length. There was no any previous history of major illness. Patient's husband reports were normal. There was failure for IUI procedure once. Patient was aware of ayurveda treatment in infertility so patient visited to Aaddya ayurveda clinic.

Past medical and surgical history: no any major illness and surgery history.

Family history: No any

Obstetric history: No any

History of contraceptives: No any

Coital history: regular unprotected coitus after every menstrual cycle.

General Examination

Temperature: afebrile; Blood pressure: 110/70mmHg; Pulse Rate: 90/min; Respiratory Rate.: 24/min; General Appearance: healthy; Weight: 56 kg; height 5'1''.

Systemic Examination

Cardiovascular system (CVS): S1S2 present; Central Nervous System (CNS): NAD; Respiratory System (RS): NAD; Per abdomen (PA): Soft.

Ashtavidha Pariksha

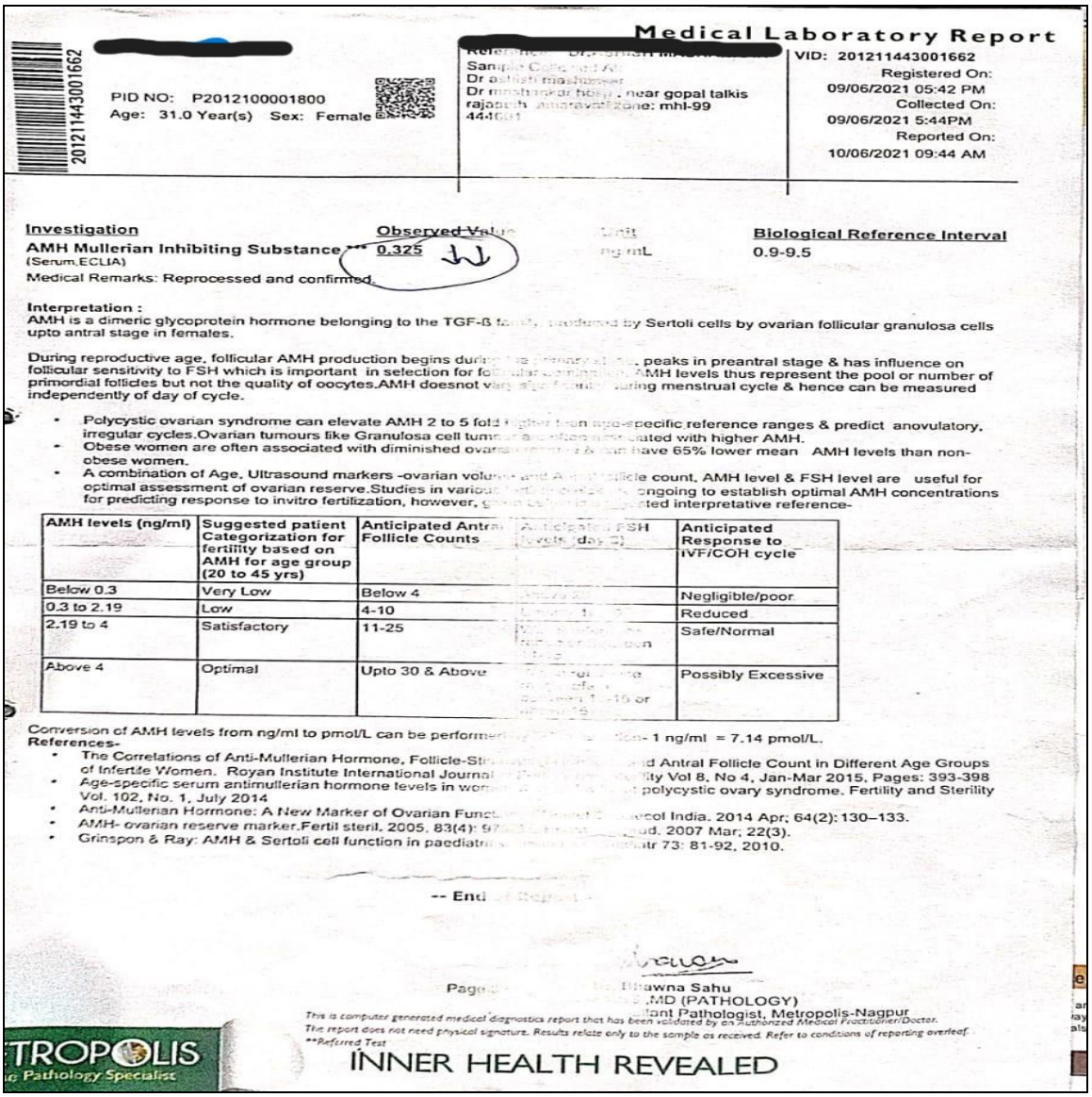
Nadi (Pulse): *Piita vataj*; *Mala* (Stool): 1 time/day, *Mutra* (Urine): *Prakrita* (Normal), *Jinhva* (Tongue): Ishat *Saam* (Coated), *Shada* (Voice): *Prakrita* (Normal), *Sparsha* (Touch): *parkrita* (normal), *Drika* (Vision): *Prakrita* (Normal), *Akruti* (Buit): *Madhyam* (Medium).

Dashavidha Pariksha

Prakruti: *pittapradhan vataj prakruti*, *Sarta*: *alpa*, *Satva*: *madhyam, satmya*: *madhyam, Vyayam shakti*: *madhyam, Vaya*: *madhyam; Vikruti*: *pitta Pradhan vataj*, *Abhyavaharan*; *Jaran shakti*: *madhyam.*

Investigations: Date-09/06/21: Serum AMH 0.325ng/ml **(Figure 1)**

Date – 25/08/21: Serum AMH 8.12ng/ml



Medical Laboratory Report

[redacted]

PID NO: P2012100001800
Age: 31.0 Year(s) Sex: Female

VID: 201211443001662
Registered On: 09/06/2021 05:42 PM
Collected On: 09/06/2021 5:44PM
Reported On: 10/06/2021 09:44 AM

Investigation	Observed Value	Unit	Biological Reference Interval
AMH Mullerian Inhibiting Substance *** (Serum,ECLIA)	0.325	ng/mL	0.9-9.5

Medical Remarks: Reprocessed and confirmed

Interpretation :
AMH is a dimeric glycoprotein hormone belonging to the TGF-ß [illegible], produced by Sertoli cells by ovarian follicular granulosa cells upto antral stage in females.

During reproductive age, follicular AMH production begins dur[illegible] peaks in preantral stage & has influence on follicular sensitivity to FSH which is important in selection for fo[illegible] AMH levels thus represent the pool or number of primordial follicles but not the quality of oocytes.AMH doesnot var[illegible]uring menstrual cycle & hence can be measured independently of day of cycle.

- Polycystic ovarian syndrome can elevate AMH 2 to 5 fold [illegible] age-specific reference ranges & predict anovulatory, irregular cycles.Ovarian tumours like Granulosa cell tum[illegible]iated with higher AMH.
- Obese women are often associated with diminished ovar[illegible] have 65% lower mean AMH levels than non-obese women.
- A combination of Age, Ultrasound markers -ovarian volu[illegible] and A[illegible]licle count, AMH level & FSH level are useful for optimal assessment of ovarian reserve.Studies in variou[illegible]ongoing to establish optimal AMH concentrations for predicting response to invitro fertilization, however, [illegible]ted interpretative reference-

AMH levels (ng/ml)	Suggested patient Categorization for fertility based on AMH for age group (20 to 45 yrs)	Anticipated Antra[illegible] Follicle Counts	Anticipated Response to iVF/COH cycle
Below 0.3	Very Low	Below 4	Negligible/poor
0.3 to 2.19	Low	4-10	Reduced
2.19 to 4	Satisfactory	11-25	Safe/Normal
Above 4	Optimal	Upto 30 & Above	Possibly Excessive

Conversion of AMH levels from ng/ml to pmol/L can be performe[illegible]- 1 ng/ml = 7.14 pmol/L.

References-

- The Correlations of Anti-Mullerian Hormone, Follicle-Sti[illegible]d Antral Follicle Count in Different Age Groups of Infertile Women. Royan Institute International Journa[illegible]ity Vol 8, No 4, Jan-Mar 2015, Pages: 393-398
- Age-specific serum antimullerian hormone levels in wor[illegible] polycystic ovary syndrome. Fertility and Sterility Vol. 102, No. 1, July 2014
- Anti-Mullerian Hormone: A New Marker of Ovarian Funct[illegible]ecol India. 2014 Apr; 64(2): 130–133.
- AMH- ovarian reserve marker.Fertil steril. 2005. 83(4): 9[illegible]d. 2007 Mar; 22(3).
- Grinspon & Ray: AMH & Sertoli cell function in paediatr[illegible]tr 73: 81-92, 2010.

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[illegible]tant Pathologist, Metropolis-Nagpur

This is computer generated medical diagnostics report that has been validated by an Authorized Medical Practitioner/Doctor.
The report does not need physical signature. Results relate only to the sample as received. Refer to conditions of reporting overleaf.
**Referred Test

TROPOLIS Pathology Specialist
INNER HEALTH REVEALED

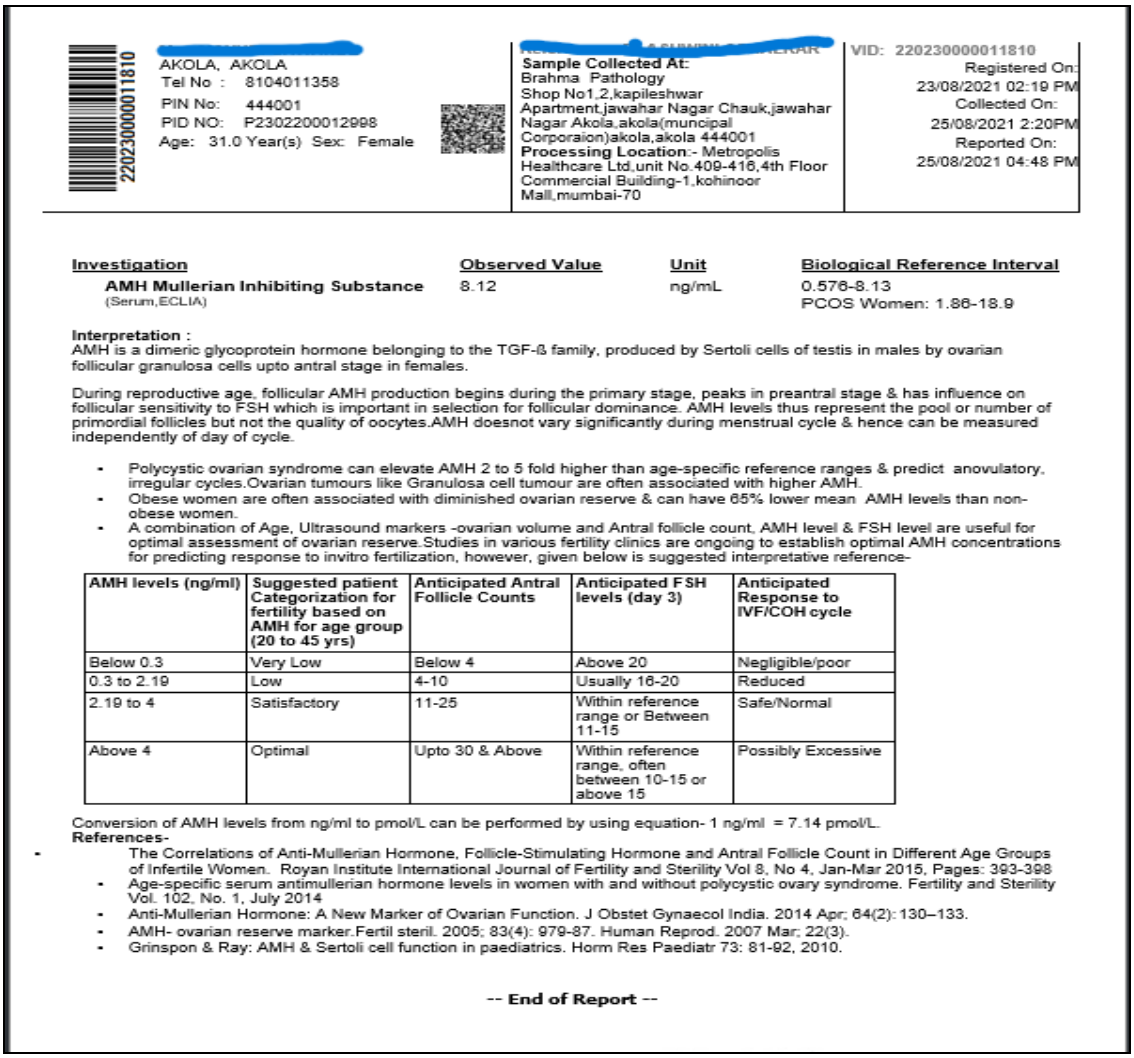
Figure 1: Investigation report of low Sr. AMH before visiting to OPD dated on 09/06/2021.

Treatment Plan

Day	Date	Complaints	Treatment
Day 1	10/06/2021	Pri. Infertility, Willing for Concetion Adhman and Aatopa	Hingavashtaka churna 250mg BD with Ghrita Before meal Pushpadhanwa rasa 250mg BD with lukewarm water
Day 15	25/06/2021	Willing for conception	Ashwagandha Churna 250mg BD with milk Pushpadhanwa rasa 250mg BD with lukewarm water Phalaghrit 1tablespoon empty stomach at morning.
Day 45	25/07/2021	Willing for conception	Same as above for 1 month. Advice sr. AMH after the medication

Follow up and outcome

Patient had primary infertility due to low Sr. AMH level (0.325ng/ml) before visiting the opd. The treatment was planned accordingly and after two and half months of treatment the Sr. AMH was repeated. There was an increased level of Sr. AMH (8.12ng/ml). **(Figure 2)**



2202300000011810

AKOLA, AKOLA
Tel No : 8104011358
PIN No: 444001
PID NO: P2302200012998
Age: 31.0 Year(s) Sex: Female

Sample Collected At:
Brahma Pathology
Shop No1,2,kapileshwar Apartment,jawahar Nagar Chauk,jawahar Nagar Akola,akola(muncipal Corporaion)akola,akola 444001
Processing Location:- Metropolis Healthcare Ltd,unit No.409-416,4th Floor Commercial Building-1,kohinoor Mall,mumbai-70

VID: 220230000011810
Registered On: 23/08/2021 02:19 PM
Collected On: 25/08/2021 2:20PM
Reported On: 25/08/2021 04:48 PM

Investigation	Observed Value	Unit	Biological Reference Interval
AMH Mullerian Inhibiting Substance (Serum,ECLIA)	8.12	ng/mL	0.576-8.13 PCOS Women: 1.86-18.9

Interpretation :
AMH is a dimeric glycoprotein hormone belonging to the TGF-ß family, produced by Sertoli cells of testis in males by ovarian follicular granulosa cells upto antral stage in females.

During reproductive age, follicular AMH production begins during the primary stage, peaks in preantral stage & has influence on follicular sensitivity to FSH which is important in selection for follicular dominance. AMH levels thus represent the pool or number of primordial follicles but not the quality of oocytes.AMH doesnot vary significantly during menstrual cycle & hence can be measured independently of day of cycle.

- Polycystic ovarian syndrome can elevate AMH 2 to 5 fold higher than age-specific reference ranges & predict anovulatory, irregular cycles.Ovarian tumours like Granulosa cell tumour are often associated with higher AMH.
- Obese women are often associated with diminished ovarian reserve & can have 65% lower mean AMH levels than non-obese women.
- A combination of Age, Ultrasound markers -ovarian volume and Antral follicle count, AMH level & FSH level are useful for optimal assessment of ovarian reserve.Studies in various fertility clinics are ongoing to establish optimal AMH concentrations for predicting response to invitro fertilization, however, given below is suggested interpretative reference-

AMH levels (ng/ml)	Suggested patient Categorization for fertility based on AMH for age group (20 to 45 yrs)	Anticipated Antral Follicle Counts	Anticipated FSH levels (day 3)	Anticipated Response to IVF/COH cycle
Below 0.3	Very Low	Below 4	Above 20	Negligible/poor
0.3 to 2.19	Low	4-10	Usually 16-20	Reduced
2.19 to 4	Satisfactory	11-25	Within reference range or Between 11-15	Safe/Normal
Above 4	Optimal	Upto 30 & Above	Within reference range, often between 10-15 or above 15	Possibly Excessive

Conversion of AMH levels from ng/ml to pmol/L can be performed by using equation- 1 ng/ml = 7.14 pmol/L.

References-

- The Correlations of Anti-Mullerian Hormone, Follicle-Stimulating Hormone and Antral Follicle Count in Different Age Groups of Infertile Women. Royan Institute International Journal of Fertility and Sterility Vol 8, No 4, Jan-Mar 2015, Pages: 393-398
- Age-specific serum antimullerian hormone levels in women with and without polycystic ovary syndrome. Fertility and Sterility Vol. 102, No. 1, July 2014
- Anti-Mullerian Hormone: A New Marker of Ovarian Function. J Obstet Gynaecol India. 2014 Apr; 64(2): 130–133.
- AMH- ovarian reserve marker.Fertil steril. 2005; 83(4): 979-87. Human Reprod. 2007 Mar; 22(3).
- Grinspon & Ray: AMH & Sertoli cell function in paediatrics. Horm Res Paediatr 73: 81-92, 2010.

-- **End of Report** --

Figure 2: Investigation report increased Sr. AMH level (8.12ng/ml) after 2 and half months of treatment dated on 25/08/2021.

RESULT AND DISCUSSION

In the current environment, bad eating habits, obesity, sedentary behavior, psychological stress, and the usage of pharmaceuticals, environmental, and work-related exposure to hormones Disruptors may have an impact on a woman's fertility.[2] Ageing is linked to poor IVF outcomes, a decline in oocyte production, and a decrease in the rate of live births and pregnancies.[1] The patient was treated based on the diagnosis of *Artavadushti*, which affected the entire reproductive system (*Garbhashaya*) and decreased ovarian reserve, resulting in low levels of AMH. Ayurvedic treatment aids in bringing the AMH levels to a desirable level, which facilitates natural conception. The patient was having *Adhman* and *aatopa* at the time of 1st visit hence for the *pachan* purpose *hingvashtaka churn* was given. *Hingvashtaka churn* has *dipan, pachan* properties. It also helpful in the loss appetite and indigestion.[3] *Pushpadhanva Rasa* shows significant potential in Ayurveda for treating the anovulatory factor contributing to infertility in women. The various *Bhasmas* included in *Pushpadhanva Rasa* possess qualities of pacifying the *Tridosha*, enhancing digestion, and facilitating the elimination of toxins. These properties help alleviate the initial stage of impaired digestive fire (*Agnimandya)* in the disease progression. Consequently, the restoration of tissue metabolism (*Dhatvagni)* takes place, leading to the proper development of the Rasa Dhatu, which, in turn, results in the appropriate generation of secondary tissues *(Upadhatu).* In the context of women's health, this can be understood as the production of hormones, the regularity of menstrual blood, and the maturation of eggs (ovum).[4] *Phalghrit* helps in the development of ovum and induction of ovulation.

CONCLUSION

AMH plays a vital role in female infertility. Ayurveda has enormous aptitude towards the female infertility and Ayurvedic management can effectively improve the low AMH level to a satisfactory level in order to have a better response to natural conception or ovarian stimulation for IVF. Thus, opening a scope to treat more such cases using Ayurvedic diagnosis and treatment.

REFERENCES

1. Oh SR, Choe SY, Cho YJ. Clinical application of serum anti-Müllerian hormone in women. Clin Exp Reprod Med, 2019 Jun; 46(2): 50-59. doi: 10.5653/cerm.2019.46.2.50. Epub 2019 Jun 1. PMID: 31181872; PMCID: PMC6572668.

2. Galey-Fontaine J, Cédrin-Durnerin I, Chaïbi R, Massin N, Hugues JN. Age and ovarian reserve are distinct predictive factors of cycle outcome in low responders. Reprod Biomed Online, 2005; 10: 94–9.
3. Shinde, Shital S. et al. "Comparative Standardization Study of Two Marketed Hingvashtak Churna Formulation." *International Journal of Scientific Research in Science and Technology*, 2016; 2: 269-274.
4. Dhanshree Deshpande and Asokan V, A Review On Pushpadhanva Rasa In Vandhyatva (Anovulatory Factor Of Infertility), World Journal of Pharmaceutical and Life Sciences, 2019; 5(8): p-221-224.