



MANAGEMENT OF VANDHYATVA (FEMALE INFERTILITY) W.S.R TO ANOVULATORY FACTOR WITH SHATAVARI- SHATAPUSHPA CHOORNA

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Abstract: Introduction: Infertility besides being health issue is more of social problem which affects personal, social and mental health of the affected person. Ovulatory disorders are generally among the most easily diagnosed and most common treatable cause of infertility. Anovulation is prime factor, which comprises 30-40% of female infertility factor. **Aim:** To evaluate the efficacy of Shatavari-ShatapushpaChoorana orally in the management of Vandhyatva (female Infertility) w.s.r. to Anovulatory factor. **Methods & Materials:** The study was conducted on 16 female subjects of anovulation with primary or secondary infertility, fulfilling the inclusion criteria and diagnosed by Transvaginal sonography for 2 consecutive cycles. Patients received Shatavari-ShatapushpaChoorana (5gm twice a day with Go-Ghrita, after cessation of menstruation) for two menstrual cycles. The observations and results were assessed by follicular study conducted from 8th-9th day of menstrual cycle till 20th day for three consecutive cycles. **Statistical Analysis:** The results were drawn after analysing nonparametric data statistically by means of Wilcoxon signed-rank test. **Results:** In the study, ovulation was achieved in 81.75% of the patients including 31.25% conceptions within follow up period. **Conclusion:** As a result, it has been concluded that Shatavari-ShatapushpaChoorana is effective treatment modality in infertility owing to anovulatory factor.

Keywords: Anovulation, Shatavari-ShatapushpaChoorana, Vandhyatva.

Introduction

Infertility is defined as a failure to conceive within one or more years of regular unprotected coitus.ⁱ Infertility has been declared as global health issue by World Health Organization. It is known to affect one out of six couples during their lifetime. Adding to the emotional and physical toll exacted by infertility is the financial burden during extensive work-up and treatment of this disease. Globally an estimated 9% of women of reproductive age suffer from infertility. This equals 80 Million women. Experts anticipate that this prevalence will rise further if women increasingly postpone child bearing until later in life.ⁱⁱ Female infertility is caused by various factors including ovulatory dysfunction, tubal factors, peritoneal factors, uterine factors, cervical factors, vaginal factors and due to coital error also. According to **International Federation of Gynecology and Obstetrics (FIGO)** manual, ovarian factor contributes 30-40% in causes of the female infertility. Thus, it is the main common cause of infertility.ⁱⁱⁱ The treatment options of female infertility also improving and traditional system of medicine such as Ayurveda describes female infertility broadly with its treatment protocol. Factors responsible for Vandhyatva can be classified into two types. Those are either due to abnormality in essential factors for fertility or due to VyadhirupaNidana (Pathological Factors). Acharya Sushruta^{iv} has mentioned four essential factors i.e., Ritu, Kshetra, Ambu and Beeja required for healthy conception. Fulfilment of all the essential factors ensures conception. Among them Beejai is the core product of the female reproductive process and without its presence, there will be no conception instead of presence all the other factors. Here, the Beejai is taken as Antahpushpai.e., ovum. So, Anovulation can be included under BeejaDushti.

Tridoshas are the root cause for each and every process or phenomenon occurs in our body. So, the process of development and enlargement from primordial follicle to the graafian follicle is said to be under effect of KaphaDosha, as Kapha has Karma like Purana, Snehana, Tarpana, etc. Snehana and Tarpana will help to give nutrition to their recruited follicle to grow. In the state of Vrudhdhi or Kshaya of Kapha, it will adversely affect the process of BeejaNirmana. Acharya Charaka has mentioned important function of Kapha i.e., Upachaya. Upachaya is given regarding proper formation of Dhatu. Artava is Agneya in nature. For process of ArtavaNirmana, Pakti and Ushma are essential factors. Ushnata and Pachana are features of Pitta Dosha. Primarily, Pitta will boost up the local Agni followed by Pachana Karma of remained Ama and then gives proper atmosphere for maturation of recruited follicles and helps to achieve ovulation. The term 'Utsarga' means to expel or to leave. Differentiation, separation and then expulsion are the function of Vata. So, Process of folliculogenesis and ovulation have influence of Vayu.

In addition, Shatavari^v and Shatapushpa^{vi} have been preferred in cases of Vandhyatva.

Considering this, it has been planned to evaluate effect of Shatavari- Shatapushpa Choorana in cases of infertility with special reference to anovulatory factor.



Materials and Methods

Selection of patients: Patients were selected from the O.P.D. of Prasutantra and Streeroga, I.P.G.T. & R.A., Jamnagar fulfilling the criteria of diagnosis and inclusion criteria, were registered for study, Irrespective of their caste, religion etc.

Inclusion Criteria

1. Female patients of child bearing age from 20-40 years
2. Patients having active married life minimum 1 year and suffering from Infertility with at least 2 or more consecutive anovulatory cycles.
3. Primary and secondary both types of infertile patients having anovulatory cycle or with immature ovarian follicle.
4. Patient eligible for Basti.

Exclusion Criteria

1. Female patients having age less than 20 years and more than 40 years.
2. Congenital deformities and infectious diseases of reproductive tract like tuberculosis, Sexually Transmitted Diseases and carcinoma
3. Chronic systemic diseases like Diabetes, Hypertension, HIV, TB etc.
4. Patient not eligible for Basti.

Ethical clearance:

The study had a due clearance from the Institutional Ethics Committee. IEC No.PGT/7/-A/Ethics/2018-19/2638 (Dated 18/12/2018). The study has also been registered in CTRI -Reg. No: CTRI/2019/02/017451. (Dated 05/02/2019)

Prior to initiation of the study, written consent was taken from each patient. Patients were asked to withdraw their name from the study at any time without giving any reason if they wish.

Selection of Drug

In present study, Shatavari-ShatapushpaChoorna orally was selected as trial drug which comprises of 2 drugs i.e. Shatavari and Shatapushpa in 3:1 proportions. This Choorna contains Katu-Tikta Rasa, Ushana-TikshnaGuna, Deepana, Pachana, Lekhana and Srotosodhana Karma. Shatavari and Shatapushpa are having Rasayana and Artavajanana property respectively.

Hence, to prove these actions it was taken for present study.

After examining the raw material for their authenticity at Pharmacognosy Laboratory, ShatavariChoorna was procured from Pharmacy of Gujarat Ayurved University, Jamnagar and Shatapushpa Seed was purchased from local market of Jamnagar on 28/2/2019. The final drug (Shatavari-ShatapushpaChoorna) was prepared in the Pharmacy, Gujarat Ayurved University; Jamnagar. Seed was lightly roasted and grinded. Then, powder was passed through sieve no 80. After that Mixture of ShatavariChoorna and ShatapushpaChoorna, it was packed in air tight container.

Posology: Before starting the treatment, Deepana-Pachana with AmapachanaVati 2 tablet (each of 500 mg) BD with luke warm water after meal for 3-5 days and KoshthaShuddhi with ErandabhrishtaHaritaki 5 gm with Luke warm water at bed time was given for 3-5 days from the 3rd day of menses. (Table 1)

Shatavari-ShatapushpaChoorna was given orally 5 gm twice a day with Anupana of Go-ghrita for 60 days before meal at morning and evening time after cessation of menses. (Table 2)

Investigations

- Routine haematological examination: Haemoglobin%, Total Count, Differential Count, Erythrocyte Sedimentation Rate (ESR), Pack Cell Volume (PCV)
- Urine: Routine and microscopic.

Criteria for diagnosis

- Trans-Vaginal Sonography (TVS) [Before Treatment (BT)] for the ovulation study.

BT- 2 month

TVS was carried out from day 9th of menstrual cycle up to at least 22nd day of the cycle to diagnose anovulation according to the growth of a follicle. In all the patients, TVS was carried out for 2 consecutive cycles for final diagnosis.



To evaluate male factor, semen analysis of the partner was carried out.

Follow up of study: After completion of course, patients were advised to report every 7 days for follow up study, which was carried out for 2 cycles. During the follow up study, ovulation study and occurrence of conception were recorded.

Criteria of Assessment

Subjective Parameter: A special proforma was prepared incorporating the associated complains related to anovulation like menstrual abnormalities. A special scoring pattern for subjective parameters was done and assessed on the basis of changes at end point in comparison to base line score. (Table 3)

Objective Parameter: On the basis of follicular study by Trans Vaginal Sonography and/or on the basis of conception. For that a special scoring method according to size of follicle was adopted.

• **Scoring Pattern of Follicle**

- 3 =<12 mm
- 2 = 12-19 mm
- 1= >19-23 mm
- 0 = Ovulated

Over All Effect of Therapy

Complete remission	100% Relief (Ovulation) were considered as complete remission.
Marked improvement	>75-≤99% Relief (>19-23mm size of follicle) were considered as marked improvement.
Moderate improvement	>50-≤75% Relief (12-19mm size of follicle) were considered as moderate improvement.
Mild improvement	>25-≤50% Relief (<12 mm size of follicle) were considered as mild improvement.
No improvement	≤ 25 (Not any change in size), i.e., immature follicle
Secondary outcome: Conception	Number of patients who conceived during or follow up period.

Statistical estimation of results

Wilcoxon signed-rank test was applied to the nonparametric statistical data for evaluating the difference between before and after treatment.

Observation

Total 16 patients were registered in this study, among them 02 patients conceived during the 1st month of treatment.

In this study, 87.5% patients had primary infertility and 12.5% patients had secondary infertility. 68.75% patients belonged to age group of 26-30 years. All patients were Hindu. 68.75% patients had 1-5 years chronicity. 56.25% patients had taken hormonal treatment for infertility. 56.25% of patients were having irregular cycle of menstruation. 6.25% patients were having scanty menses. 31.25% had painful menses. 6.25% were having duration of menstrual period of <2 days. 18.75% were having duration of menstrual period of >5 days. 68.75% of patients were having >35 days interval of cycle. 68.75% had marital life of 1-5 years. 68.75% patients had Vata Pitta Prakriti. 81.25% and 56.25% of patients had Adhyashana and Vishamashana respectively. 12.5% were having poor appetite. The patients had reported dominancy of Katu Rasa (93.75%), Amla Rasa (81.25%) and Madhura Rasa (50%) in their regular diet. 81.25% of patients were not doing any kind of exercise. Disturbed sleep was observed in 25% patients. 81.25% of patients had habit of Diwaswapna. Chinta, Shoka, Krodha and Bhaya were present in 87.50%, 50%, 12.5% and 18.75% of patients respectively. 75% of patients were having Grade 2(21-25) BMI, 12.5% with Grade 3 (26-30) BMI and 6.25 % were having Grade 4(>30) BMI. 25% male partners were reported with abnormal semen report.

Results

Effect of Shatavari-ShatapushpaChoorna on Subjective Parameter

Statistically significant improvement was found in group B (P=0.004). Percentage of relief i.e., 39.06 % was showed in group B in Interval of menses. Statistically insignificant improvement was observed in group B (P=0.250). Percentage of relief i.e., 19.79% was showed in group B in Duration of menses. Statistically insignificant improvement was observed in group B (P=0.250). Percentage of relief i.e., 11.53% was showed in group B in Quantity of menses. In Group B, 35.89% (P=0.063) relief was found in Pain during menses, this data was statistically insignificant (Table 4).



Effect of Shatavari-Shatapushpa Choorna on Objective Parameter

Before treatment, size of follicle was 0-12 mm in 14 patients (87.5%), while size of follicle was found with >12-19 mm in 2 patients (12.5%). During 1st cycle of treatment, 3 patients (18.75%) had 0-12 mm size, while rupture of follicle was found in 13 patients (81.25%). During 2nd cycle of treatment, 03 patients (21.42%) had 0-12 mm size follicle, while rupture of follicle found in 13 patients (78.57%). After treatment, 07 patients (50%) had ovulation, 04 patients (28.57%) had 0- 12 mm follicle and 3 patients (21.42%) had >12-19 mm size. 2 patients conceived after 1st month of treatment. (Table 5) The initial mean score of follicular size was 2.71 which were 0.5 after the treatment. This improvement was statistically highly significant ($P < 0.001$) (Table 6).

Follicular size in follow up period

In 1st follow up month, 6 patients (54.54%) had follicular size 0-12 mm and 5 patients (45.45%) of patients had ovulation. In 2nd follow up month, 4 patients (40%) had follicular size 0-12mm, 3 patients (30%) had increased follicle size up to 12-19mm and 3 patients (30%) had ovulation.

2 patients got conception during 2nd month of follow up period and one patient conceived after completion of treatment (Table 7).

Overall Effects of Therapies

Complete remission i.e. (Ovulation) was found in 85.71% of the patients. 14.28% were remaining unchanged. 31.25% of the patients got conception. (Table 8)

Discussion

Infertility besides being health issue is more of social problem which affects personal, social and mental health of the affected person. Due to changing social system, professional life and academic achievement more and more couples face this problem. In India commonly held pressure about infertility it that due to female partner; however, in actual life both partners contribute equally to infertility.^{vii} **Anovulation** due to endocrine disorders, polycystic ovarian diseases, corpus LPD, hyperprolactinemia is one of the important causes of **Female Infertility**.

While considering the age, maximum numbers of patients i.e., 68.75% belonged to age group of 26-30 years. One study has stated that reproductive aging is the natural process of declining fecundibility as woman progresses through the stage of puberty, fertility, menopause transition and menopause. The cause of age-related infertility is multifactorial. There is demonstrated decrease in oocyte number as woman progress through their reproductive years. Furthermore, the rate of miscarriage and chromosomal abnormalities increases with increasing maternal age. The impact of age-related behaviours, such as decrease in sexual activities, on fertility is difficult to quantify.^{viii}

In this study, 87.5% patients were having primary infertility, while 12.5% patients were having secondary infertility. In 2010, finding has estimated 48.5 million couples worldwide were unable to have a child after five years. It is important to note that an infertility measures based on ability to become pregnant may show higher rates of infertility (Primary infertility).^{ix}

68.75% of patients included in present study were having 1-5 years chronicity. Data shows the early preference has been given to the Ayurvedic treatment due to enormous expenditure, harmful effect of allopathic drugs and didn't want multiple surgical interventions. Distribution of history of previous treatment revealed that 56.25% of patients had received hormonal treatment. Initial treatment for women with anovulatory infertility involves a sequential approach, moving from less to more resource therapies. Intervention that increases fecundibility in anovulatory women includes optimization of weight, letrozole, CC, gonadotropin injection, IUI and IVF.^x

According to Ayurveda point of view, irregular menses (Yathochita Kala Adarshanam), scanty menses (Alpata) and dysmenorrhea (Yonivedana) are the Lakshana of ArtavaKshaya. It indicates any pathology formation within Shree-Sharira. One prospective observational study has been concluded that Mean menstrual cycle length is highly related to success rates in assisted reproduction, independently of age. A precise menstrual cycle history could be used as a simple marker of ovarian reserve.^{xi}

43.75 % of patients were having Vishmaggni, while Mandagni was observed in 25% of patients. Acharya Vagbhata^{xii} has stated that VataDosha is having predominance in Vishmaggni. He also said that there is improper digestion takes place on presence of Vishmaggni, while Mandagni suggests the vitiation of Kapha. It shows that Vata-KaphaPradhanyata in infertility which may cause Anovulation. So, it may lay as root cause for various Roga.^{xiii} One pilot study has documented a relationship between the accuracy of dietary survey and the psychological characteristics of subjects with anovulation.^{xiv}



In the present trial, faulty dietary habits detected in the majority the patients were Adhyashana and Vishamashana, which constitute 81.25% and 56.25% respectively. Acharya Charaka has stated that irregular dietary habits might become the cause for the diseases generating pathogenesis.^{xv} So, this vitiation further leads to disturbed transformation of Rasa Dhatu and its Upadhatu (Artava).

Mainly Katu(93.75%), Amla(81.25%) and Madhura Rasa (50%) dominancy were found in the diets consumed by the patients included in study. If Katu Rasa is consumed in Atimatra, it may cause Balakshaya, UpahataShukra, Dahajanaka, Vataja Shula, etc. KaphaVilayana, ShariraShaithilya, Shotha, Dahaetc are the symptoms which are originated due to Atimatra Amla Rasa Sevana. Ati Madhura Rasa SevanaCuasesKaphaPrakopa, Arbuda, Abhishyanda etc.^{xvi} The amount and quality of carbohydrates in diet may be important determinants of ovulation and fertility in healthy women, as suggested by some studies.^{xvii,xviii}

While considering the habit of exercise, it showed that 81.25% of patients were not doing any kind of exercise. There is correlation found that the influence of dietary management and/or physical exercise on ovarian function and metabolic variables in women with polycystic ovary syndrome (PCOS).^{xix}

Disturbed sleep was observed in 25% patients. 81.25% of patients were found with habit of Diwaswapna. Diwaswapna causes Pitta-Kapha-RaktaDushti. PrakupitDosh will result into Agnimandhya. Agnimandya leads to Rasa Dushti and creates disturbance in formation of its UpadhatuArtava.^{xx} Altered sleep duration and/or sleep continuity disturbance may interfere with reproduction or results in further increased HPA activation.^{xxi} The Hypothalamic-Pituitary-Adrenal (HPA) axis and sleep interact in multiple ways. Two sleep disorders [insomnia and obstructive sleep apnea (OSA)] that are associated with HPA axis dysfunction.^{xxii} One survey study was revealed that although menstruating women are likely to show increased disturbance during the luteal phase, those with other, more severe PMS are more likely to experience luteal increase in daytime sleepiness.^{xxiii}

Chinta, Shoka, Krodha and Bhaya were observed in 87.50%, 50%, 12.5% and 18.75% of patients respectively. Manasika Bhavas can be taken as ViprakrushtaNidana. It leads to Vata –Pitta Prakopa which again lead to vitiation of Dosh, Dhatu and Mala.^{xxiv} Ultimately it hampers the proper formation of Rasa Dhatu and its Upadhatu. PrakupitaVata hampers the abnormal growth. Infertility is often a silent struggle. Patients who are struggling to conceive report feelings of depression, anxiety, isolation, and loss of control. A recent literature review on the prevalence of psychological symptoms in infertility concluded that 25% to 60% of infertile individuals report psychiatric symptoms and that their levels of anxiety and depression are significantly higher than in fertile controls.^{xxv} In stress there is suppression of circulating gonadotropins and gonadal steroid hormones leading to disruption of the normal menstrual cycle.^{xxvi} Catecholamines, prolactin, adrenal steroids, endorphins, and serotonin all affect ovulation and in turn are all affected by stress. Possibly this can be explained by a reduction in stress, and subsequently, alterations in the neuro endocrinologic characteristics of the infertile couple.^{xxvii}

Constipation was present in 18.75% of the patients. According to Ayurvedic principles, constipation is related to Apana Vata vitiation which is the most responsible factor for Vandhyatva.

75% of patients were having Grade 2(21-25) BMI, 12.5% with Grade 3 (26-30) BMI and 6.25 % were having Grade 4(>30) BMI. Some studies showed that energy balance is more important than body fat mass itself for ovulatory function, since in some cases recovery may occur after minimal reacquisition of weight, or even long before there is any change in body weight or an increase in body fat.^{xxviii}

25% male partners were reported with abnormal semen report.

Probable Mode of Action of Shatavari-ShatapushpaChoorna

Shatavari-ShatapushpaChoorna is having Tikta, Katu and Madhura Rasa, UshnaTikshna-Snigdha-Guru Guna, Madhura Veepaka and AnushnaSheetaVeerya. It is also having properties like Vrushya; Rasayani; Pathya; Pushpaprajakari; Balya; Brimhaniya; Deepana; Pachana; Yonivishodhana; Rutupravartana; Prajasthapana etc. “Pushpaprajakari” indicates both AntahpushpaJanana and BahirpushpaJanana and Prajakara. Here, “Rutupravartana” indicates both Artavajanana and Beejotsarga. So, it ultimately leads to Karmas such as Deepana, Pachana, Vilayana, Anulomana, and Srotoshodhana resulting Amapachana and Vata-Pitta Shamana, which may remove Sanga and Avarana leads to proper function of Tridosha that will normalize Dhatu-UpadhatuNirmana and regulating function of Beejakosha and Beejotsarga as well as corrects menstrual abnormalities.

As per Modern view, Shatavari^{xxix} and Shatapushpa^{xxx} are having phytoestrogenic property. Phytoestrogen have ability to affect the endogenous production of estrogen. The pituitary gland releases gonadotrophins that stimulate estrogen synthesis in the ovaries.



One study has been concluded that consumption of isoflavones-rich soy foods (contains phytoestrogens) suppresses circulating estrogen and progesterone levels and can attenuate the preovulatory surge of luteinizing hormone (LH) and follicle-stimulating hormone (FSH).^{xxxii}[31]

Hence, the drugs were effective by regulating the GnRH pulsatile release, normalize hypothalamus-pituitary-ovarian axis, corrects hormonal orchestra, normalize ovulatory dysfunction and attain the healthy state of body, which helps to achieve conception through Shatavari-ShatapushpaChoorna.

Conclusion

Goghrita is the best Shamana drug for Vata-Pitta and Shatavari-Shatapushpa possess phytoestrogenic constituents. Hence, this combination boosts up the process of ovulation. phytoestrogenic, Prajasthapana, Antioxidant and Antidepressant properties helps to relieving stress and regularize the function of ovary. In nut cell, it can be concluded that Shatavari-ShatapushpaChoorna is highly effective to induce ovulation & achieving conception.

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Conflicts of interest: There are no conflicts of interest.

Table: 1 Treatment Modality

Treatment Modality	Drug	Dose	Duration
Deepana- Pachana	AmapachanaVati	2 Tablets (each of 500mg) b.i.d. with luke warm water half hour after meal.	3 days
KoshthaShuddhi	ErandabhrishtaHaritaki	5 gm. or as per Koshtha with luke warm water at bed time	3 days

Table: 2 Posology

Drug	Route	Dose	Duration	Time
Shatavari-Shatapushpa Choorna	Oral	5 gm twice a day with Goghrita	For 2 consecutive months After cessation of menses	Before meal (At morning & evening time)

Table 3: Scoring Pattern for Menstrual abnormalities

(a)Duration of Menstrual Cycle 0 - 4-7 days 1 - 3 days 2 - 2 days 3 - 1 day	(b) Interval between two cycles 0 - 24 to 30 days 1 - 30 to 34 days 2 - 35 to 39 days 3 - 40 to 45 days 4 - above 45 days
(c) Quantity of menstrual blood 0 - 4 or more than 4 pad use / cycle 1 - 3 pad use / cycle 2 - 2 pad use / cycle 3 - 1 pad use / cycle 4 - Spotting bleedings without pads	(d) Pain during menses (Yonivedana) 0- No pain 1- Mild pain 2- Moderate pain 3- Severe pain

Table -4 Effect of therapy on Menstruation (n=14) (Sign Rank Test)

Subjective Parameter	Mean		Mean diff	% of Relief	W	Z	P	Significance
	B.T.	A.T.						
Duration of Menstruation	0.28	0.07	0.15	14.28	-6.000	-1.732	0.250	IS



Interval of Menstruation	2.07	1.07	0.84	36.53	-45.000	-2.724	0.004	S
Quantity of Menstruation	0.64	0.35	0.15	11.53	-6.000	-1.633	0.250	IS
Pain during Menstruation	0.71	0.14	0.69	35.89	-15.000	-2.070	0.063	IS

(n=number of patients, IS- insignificant, S- Significant)

Table-5 Effect of Shatavari-ShatapushpaChoorna on Follicular Growth and Ovulation (n=16)

Size of follicle (in mm.)	No. of patients	B.T.		D.T. (1st Cycle)		D.T. (2nd Cycle)		A.T.	
		%	No. of patients	%	No. of patients	%	No. of patients	%	No. of patients
0-12	14	87.50	03	18.75	03	21.42	04	28.57	
>12-19	02	12.50	00	00.00	00	00.00	03	21.42	
>19-23	00	00.00	00	00.00	00	00.00	00	00.00	
Ovulation	00	00.00	13	81.25	13	78.57	07	50.00	

Table-6 Effect of Therapy in Follicular Size (Sign Rank Test)

N	Mean		Mean diff	% of Relief	W	Z	P	Significance
	B. T	A. T.						
14	2.71	0.5	2.38	90.47	-91.00	-3.162	<0.001	HS

(n=number of patients, HS- Highly significant)

Table – 7 Follicular sizes in follow up period

Size of follicle (in mm.)	n=13		n=12	
	No.of patients	1st month	No.of patients	2nd month
0-12mm	06	54.54	04	40.00
>12-19mm	00	00.00	03	30.00
>19-23	00	00.00	00	00.00
Ovulation	05	45.45	03	30.00

Table – 8 Overall Effects of Therapies

Parameters	No. of patients	%
Conceived	05	31.25
Complete remission	13	81.25
Markedly Improved	00	00.00
Moderately Improved	00	00.00
Unchanged	03	18.75

Table-9 Total Effect of Therapy on Ovulation

Status of follicle	No. of patients	%
Ruptured	13	81.25
Unruptured or immature	03	18.75



References

- ⁱThe text book of Gynecology, DC Dutta, edited by Hiralal Konar, 7th edition, The Health Sciences Publisher Delhi Ch.17 pg.186
- ⁱⁱ[https://www.figo.org/sites/default/files/uploads/wg-publications/reproductive medicine /FIGO_ Fertility _Tool_Box.pdf](https://www.figo.org/sites/default/files/uploads/wg-publications/reproductive%20medicine/FIGO_Fertility_Tool_Box.pdf), page no 13
- ⁱⁱⁱHiralal Konar, DC Dutta's the text book of Gynecology, The Health Sciences Publisher Delhi, 7th edition, Chapatientser 17, pg 188
- ^{iv}Kaviraja Ambikadutta Shashtri, Sushruta Samhita, Chaukhamba Sanskrit Sansthan, Varanasi, 2014, Sharira Sthana, 2/35, page 19
- ^vShri Satyapal Bhishagacharya, Kashyapasamhita, chaukhambhasanskritasamsthana, 2016, khilsathan 8/ 5-6, pg.- 185-186
- ^{vi}Shri Satyapal Bhishagacharya, Kashyapasamhita, chaukhambhasanskritasamsthana, 2016, khilsathan 8/ 5-6, pg.- 185-186
- ^{vii}Suneshkumar, Howkins & Bourne Shaw's Textbook of Gynaecology, published by Relax India pvt. Ltd., 17th edition, 2018, chapter 16, page 202
- ^{viii}Natali m crowford, Age- related infertility, Obstetrics & Gynecology Clinics, 2015, volume 42(1): 15–25
- ^{ix}Maya N. Mascarenhas, National, Regional and Global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys, PLOS Medicine, volume 9 (12), 1-12
- ^xRobert L. Barbieri, female infertility, Yen and jaffe's reproductive endocrinology, editor: Jerome F. Struass, eighth edition, 2019, e7, page 556-581
- ^{xi}Thomas Brodin M.D, Menstrual cycle length is an age-independent marker of female fertility: results from 6271 treatment cycles of in vitro fertilization, Fertility and Sterility Volume 90, Issue 5, November 2008, Pages 1656-1661
- ^{xii}Pandit Hari Sadashiva Shashtri Paradakara, Ashtanga Hridaya, Chaukhamba Surabharati Prakashana, 2018, Nidanasthana, 12/1, page 513
- ^{xiii}Shree Hari Sadashiva Shashtri, Ashtanga Hridaya, Chaukhamba Subharati Prakashana, Sutrasthana, 2018, 1/8, Shree Arundutta and Hemadriteeka, page 8.
- ^{xiv}Ottavia Colombo, Dietary intakes in infertility women a pilot study, Nutritional journal, 2009, volume 8:53, page 1-9
- ^{xv}Prof R.H.Singh, Charakasamhita, Chaukhamba Surabharati prakashana, 2020, Sutrasthana, 28/42, page 181
- ^{xvi}Kaviraja Ambikadutta Shashtri, Susruta Samhita, Chaukhamba Sanskrita Sansthana, 2014, Sutrasthana, 42/15, page 203
- ^{xvii}Douglas CC, Difference in dietary intake between women with polycystic ovary syndrome and healthy controls, Fertility and Sterility, 2006, volume 86, 539-544
- ^{xviii}Chavarro JE, A prospective study of dietary carbohydrate quantity and quality in relation to risk of ovulatory infertility, European journal of Clinical Nutrition, 2009, volume 63, 78-86
- ^{xix}Åsa Nybacka B.Sc, Randomized comparison of the influence of dietary management and/or physical exercise on ovarian function and metabolic parameters in overweight women, with polycystic ovary syndrome, Fertility and Sterility, Volume 96, Issue 6, December 2011, Pages 1508-1513
- ^{xx}Kaviraja Ambikadutta Shashtri, Susrutasamhita, Chaukhamba Sanskrit Sansthan, 2014, Sharirasthana, 4/37, page 45
- ^{xxi}Jacqueline D kloss, Sleep, sleep disturbance and fertility in women, sleep medicine reviews 22,78-87,2015
- ^{xxii}Theresa M. Buckley, On the Interactions of the Hypothalamic-Pituitary-Adrenal (HPA) Axis and Sleep: Normal HPA Axis Activity and Circadian Rhythm, Exemplary Sleep Disorders, The Journal of Clinical Endocrinology & Metabolism, Volume 90, Issue 5, 1 May 2005, Pages 3106–3114
- ^{xxiii}Manber, Sleep and the menstrual cycle., Health Psychology, Vol 16(3), May 1997, 209-214
- ^{xxiv}Prof R.H.Singh, Charakasamhita, Chaukhamba Surabharati prakashana, 2020, Nidanasthana, 1/7, page 194
- ^{xxv}De Berardis D, Psychopathology, emotional aspects and psychological counselling in infertility: a review. Clin Ter. 2014;165(3):163-169
- ^{xxvi}Cameron JL. Stress and behaviorally induced reproductive dysfunction in primates. Semin Reprod Endocrinol. 1997; 15:37–45
- ^{xxvii}Seibel MM, Taymor ML. Emotional aspects of infertility. Fertil Steril 1982; 37:137-45.
- ^{xxviii}Loucks AB, Energy availability, not body fatness, regulates reproductive function in women, Exercise and sport science review, 2003, volume 31: 144-148
- ^{xxix}Sana Fatima Majeedi, Efficacy of Asparagus recemosus (Satavar) in stimulating follicular growth and ovulation in anovulatory infertility: a randomized controlled trial, International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 2016, volume-5(2):310-316
- ^{xxx}Dr. M.B. Pillewan, Analytical Analysis of Shatapushpa Described in Kashyapasamhita: A Review, International Journal of Agriculture Innovations and Research Volume 6, Issue 5, 158-159
- ^{xxxi}Murkies A, Dietary flour supplementation decreases post-menopausal hot flushes: effect of soy and wheat. Maturitas, 1995;21:189–195

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