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Research Article

A CLINICAL STUDY TO EVALUATE THE ROLE OF *SHATPUSHPA TAILA UTTAR BASTI* AND *ASHWAGANDHA CHURAN* IN THE MANAGEMENT OF *BANDHYATVA* ON THE PARAMETERS OF APPLEBAUM SCORE AND OXIDATIVE STRESS

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ABSTRACT

In Ayurveda, infertility is termed *Bandhyatva* and is primarily attributed to vitiation of *Vata Dosha*, which governs reproductive physiology. *Shatpushpa Taila Uttar Basti* is considered one of the most effective local therapies for balancing *Vata* and enhancing uterine receptivity, while *Ashwagandha Churna* possesses *Rasayana* and *Vajikarana* properties that reduce oxidative stress and improve systemic reproductive vitality. **Aim & Objective:** To evaluate the efficacy of *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* in the management of *Bandhyatva* with respect to Applebaum Score and Oxidative Stress. **Materials and Methods:** A randomized open-label comparative clinical study was conducted on 60 clinically diagnosed patients of infertility associated with thin endometrium aged 20–40 years. Patients were allocated into three groups 20 each: Group I received *Shatpushpa Taila Uttar Basti*, while Group II received oral *Ashwagandha Churna* and Group III received *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* orally. Subjective parameters included menstrual irregularity, libido, dyspareunia and psychological evaluation stress, *Saar Pariksha* while objective parameters included Applebaum score for endometrial receptivity and Oxidative Stress markers, USS follicular study and hormonal profile. Statistical analysis was performed using paired Student's t-tests and Anova (F) test. **Discussion:** The therapeutic effect on oxidative stress and Applebaum score was found to be moderately significant in Group II *(Ashwagandha Churna orally)*, and highly significant in Group 1 (*Shatpushpa Taila Uttar Basti* and Group III *(*combined *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* orally*)*. However, intergroup comparison of subjective and objective criteria predominantly revealed statistically non-significant differences. **Conclusion:** *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* were found to be safe and clinically effective in the management of *Bandhyatva*. Both treatment protocols produced significant improvement in endometrial receptivity and oxidative balance, thereby enhancing fertility outcomes.

INTRODUCTION

Infertility varies across the regions of the world and is estimated to affect 8%- 12% of the couple worldwide. It is increasingly recognized as one of the most pressing public health concerns of the twenty-first century.

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Infertility is not merely a medical condition but a multifaceted phenomenon that intersects biology, psychology, sociology, and ethics. Its impact extends far beyond the individual, influencing family structures, cultural expectations, and demographic patterns at both national and global levels. According to the International Federation of Gynecology and Obstetrics manual, the causes are peritoneal factors (35%), tubal factor (30%), ovulatory factor (20%), and uterine factor (15%). Among these uterine factors, as endometrial abnormalities play an important role in the causation of infertility. The implantation rate

(10.17%) is significantly lower in patients with thin endometrium

Medical Definition

Reproductive endocrinologists define infertility as:

- Failure to conceive after 12 months of unprotected intercourse if the female is under 35 years.
- Failure to conceive after 6 months of unprotected intercourse if the female is over 35 years, due to declining egg quality.

Infertility is a complex condition influenced by multiple physiological, environmental, and lifestyle factors. One of the critical mechanisms implicated in infertility is oxidative stress, which arises from an imbalance between free radicals and antioxidants in the body oxidative stress occurs when pro-oxidant production exceeds the capacity of the body's antioxidant defenses, including enzymes (superoxide dismutase, catalase, glutathione peroxidase) and small-molecule scavengers (vitamins C, E, glutathione). In the reproductive system, this imbalance can impair gamete quality, fertilization, and implantation. In males, excessive reactive oxygen species (ROS) can damage sperm membranes, reduce motility, and fragment DNA. In females, oxidative stress can disrupt folliculogenesis, oocyte maturation, and endometrial receptivity, thereby hindering conception.

The resulting macromolecular damage has been linked to:

- Poor sperm function and male subfertility
- Ovarian dysfunction and anovulation
- Tubal and uterine factor infertility
- Early pregnancy loss

AIM

To evaluate the role of *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churan* in the management of *Bandhyatva* on the parameters of Applebaum Score and Oxidative Stress.

OBJECTIVES

1. To evaluate the therapeutic efficacy of *Shatpushpa Taila Uttar Basti* in the management of *Bandhyatva.*
2. To evaluate the therapeutic efficacy of *Ashwagandha Churna* in the management of *Bandhyatva*
3. To explore the concept of *Bandhyatva* in Ayurveda.
4. To study the impact of psychological counselling in infertile women to fulfil the aim and objectives of the study.
5. *Prakriti* Analysis.

MATERIALS AND METHODS

Inclusion Criteria

All patients having Applebaum score ≤17 along with-

a. Fulfilling the criteria of *Bandhyatva* according to Ayurveda.
b. History of *Bandhyatv*a for more than 1 year of unprotected intercourse under 35 years or for 6 months for couples over 35.
c. Patients having *Beejadushti* (Anovulatory infertility).
d. Patients having *Artvavahasrotosanga* (unilateral or bilateral tubal blockage).
e. All patients having one or more (*Garbhsravi*) abortions previously.
f. Patient planning for IVF.

Exclusion Criteria

a. Patient less than 20 and more than 40 years of age.
b. Reproductive tract pathologies including acute PID, STD, uterine or cervical polyp, fibroid uterus.
c. History of patient having any congenital genital tract anomalies like unicornuate, bicornuate uterus etc.
d. Patient suffering from systemic diseases such as diabetes mellitus, renal disorders, cardiac disorders etc.

Study Design: Randomized, multi-centric, prospective open label comparative clinical study.

Level of Study: IPD and OPD level

Place of Study: The clinical study was conducted at R.G.G.P.G. Ayurvedic College and Hospital in Paprola, while the measurement of oxidative stress test was done at CSKHPKV Palampur, Kangra, Himachal Pradesh

Group 1: Patients were managed with *Shatpushpa Taila Uttar Basti*.

Group 2: Patients were managed with *Ashwagandha Churan* orally.

Group 3: Patients were managed with *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churan* orally.

Sample Size (number of patients): Minimum 20 patients in each group

Laboratory Investigation

1. Hematological test: CBC, ESR, ABO blood group with RH Incompatibility, RFT.
2. Serological test: HIV, VDRL, HBsAg.
3. Urine: Routine, Microscopic examination.
4. Hormonal test: Serum estrogen, serum progesterone (day 2 and day 21 of the cycle), serum TSH, serum prolactin, serum LH, AMH, FSH (day 2 of cycle)
5. Endometrial biopsy- CBNAAT, HPE.
6. Sonosalpingography
7. Ultrasonography: Graafian Follicular study, Applebaum Score.

8. Measurement of oxidative stress was done at CSKHPKV, Palampur.
9. UPT in case of amenorrhea.

Criteria of Assessment

Subjective criteria

Menstrual Cycle

***Krichhartava* (For pain in abdomen during menses):** Level of pain was measured following VAS score and Numeric Rating scale for pain.

PBAC Scoring for amount of blood loss during menses: Total PBAC Score Interpretation-

Scanty 0-50

Normal 50-100

Heavy menstrual flow >100

Duration of menstrual bleeding: Grade

<3 days- Short

3-5 days- Moderate

6-9 days- Prolonged

>9 days- Very prolonged

Assessment of Intermenstrual interval: Grade

28-35 days- Normal

36-60 days- Prolonged

61-90 days- Very prolonged

>90 days- Amenorrhea

Marin off Dyspareunia scale: Grade

No Pain during intercourse- 0

Pain during intercourse that does not prevent intercourse- 1

Pain during intercourse that interrupts intercourse- 2

Pain that prevents the intercourse- 3

Libido scoring system

Overall Assessment Grade

Loss of libido 0-2

Low libido 3-4

Good libido 5-7

High libido 8-12

Psychological evaluation test for infertile couple

This was assessed by asking questions from couple and a PET score > 30 points was defined as cut-off point. Patient needs psychological support in that case.

Balkshaya* (Generalised weakness)*: Saar Pariksha

The scoring of ≤12 was considered as cut off point. Below which she was having *Avara Saar*.

Objective criteria

1. Measurement of Oxidative stress MDA (Malonidialdehyde)

Normal range Optimum range

2. Serum Estrogen (day 2): <50pg/ml ≥30pg/ml

3. Serum Estrogen (day 21-23): 200-350pg/ml 200-300pg/ml

4 Serum Progesterone (day 2): <1ng/ml

5. Serum Progesterone (day 21-23): >6ng/ml ≥10ng/ml

6. Assessment of Follicular study on USG

7. Applebaum Score: On 10th day of menstrual cycle

Parameters Scoring

Endometrial thickness

<7mm- 0

7-9mm- 2

10-14mm- 3

>14mm- 1

Endometrial layering

No layering- 0

Hazy 5 line- 1

Distinct 5 line- 2

Endometrial motion

<3 contraction in 2 minute 0

>3 contraction in 2 minute 1

Myometrial Echogenicity

Coarse, inhomogeneous- 0

Relatively homogenous- 1

Uterine artery Doppler flow

2.5-3- 0

2.2 -2.49- 1

< 2.19- 2

Endometrial blood flow within zone 3

Absent- 0

Sparse blood Flow- 2

Multifocal blood Flow- 3

Myometrial blood flow on gray scale examination

Absent- 0

Present- 1

Score Chances of pregnancy

20 97.4%

17-19 85.4%

14-16 28.6%

<13 0%

Overall Assessment of Result

Good >75% improvement in subjective/objective parameters /conception.

Fair 50-75% improvement in subjective/objective parameters

Poor 25-49% improvement in subjective/objective parameters

No response <25% improvement in subjective/ objective parameters

Statistical Analysis of data

The data obtained in clinical study before and after the intervention was expressed in term of mean, Standard deviation (SD) and standard Error (SE), t and P values and were calculated by using paired 't' test. Inter group comparison was done by Anova (f) test.

The obtained results were interpreted as:

Non-Significant Result - P>0.05

Moderate significant - P<0.01

Highly significant - P<0.001

Result of Therapy

OBSERVATIONS AND RESULTS

A total of 66 patients were registered, 22 patients in group 1, 23 patients in group II and 21 patients in group III, but 06 of these were dropped out of the study due to unfavorable circumstances like loss to follow up, irregular treatment attendance, personal reasons and conception. Therefore, in this present study, clinical data were presented according to 60 patients.

Effect of Therapy on Subjective Parameters Group 1: (BT vs AT)

Signs & symptoms	Mean score		Mean Difference	% Relief	SD	SE	t	P	Result
	BT	AT							
Pain during menses	1.6	0.9	0.7	43.8	0.470	0.105	6.65	<0.001	HS
Amount of bleeding	8.3	5.1	3.2	38.6	9.4	2.1	2.3	<0.01	MS
Interval of menstrual cycle	55.0	43.2	11.8	21.4	9.99	2.23	7.58	<0.001	HS
Duration of menses	8.2	7.0	1.2	14.66	0.9	0.206	6.2	>0.05	NS
Dyspareunia	2.2	1.4	0.8	36.36	0.410	0.091	8.718	<0.001	HS
Libido	3.0	3.9	0.9	30.8	0.887	0.198	7.815	<0.05	MS
Psychological evaluation test	46.1	33.6	12.55	27.11	3.818	0.854	14.7	<0.05	MS
Balkshaya (Generalised weakness)	7.7	11.7	3.9	51.95	1.538	0.334	11.48	<0.001	HS

Effect of Therapy on Subjective Parameters Group 2: (BT vs AT)

Signs & symptoms	Mean score		Mean Difference	% Relief	SD	SE	t	P	Result
	BT	AT							
Pain during menses	1.9	1.5	0.4	18.42	0.489	0.109	3.199	>0.001	HS
Amount of bleeding	9.5	7.6	1.9	20.0	9.8	2.203	2.246	>0.05	NS
Interval of menstrual cycle	56.0	39.0	17.0	30.36	10.4	2.33	5.042	<0.001	HS
Duration of menses	8.3	7.4	0.9	10.8	0.308	0.068	1.453	<0.05	MS
Dyspareunia	2.3	1.6	0.7	34.7	0.616	0.138	5.812	<0.001	HS
Libido	2.8	4.3	1.5	53.5	0.308	0.068	1.453	<0.05	MS
Psychological evaluation test	46.1	38.5	7.6	16.49	4.005	0.896	8.486	<0.001	HS
Balkshaya (Generalised weakness)	7.8	9.4	1.6	20.51	1.095	0.245	6.532	<0.001	HS

Effect of Therapy on Subjective Parameters Group 3: (BT vs AT)

Signs & symptoms	Mean score		Mean Difference	% Relief	SD	SE	t	P	Result
	BT	AT							
Pain during menses	1.4	0.5	0.9	62.4	0.510	0.114	13.58	<0.001	HS
Amount of bleeding	9.5	5.5	4.0	51.3	9.4	2.102	2.355	<0.01	MS
Interval of menstrual cycle	52.0	29.9	22.1	43	11.9	2.68	8.434	<0.001	HS
Duration of menses	8.1	5.5	2.6	32.7	0.967	0.216	15.0	<0.01	MS
Dyspareunia	2.2	1.05	1.15	52.4	0.686	0.153	13.3	<0.001	HS

Libido	4.8	7.7	2.9	62.3	1.146	0.256	15.4	<0.01	MS
Psychological evaluation test	42.7	26.6	16.1	37.7	4.303	0.962	16.7	<0.001	HS
Balkshaya (Generalised weakness)	8.0	12.3	4.3	53.8	1.949	0.436	25.9	<0.001	HS

Effect of Therapy on Objective Criteria Group 1: (BT vs AT)

Investigation	Mean score		Mean Difference	% Relief	SD	SE	t	P	Result
	BT	AT							
Oxidative stress (MDA)	1.93	1.83	0.10	5.18	0.11	0.02	3.973	<0.001	HS
Sr. Estrogen	181.3	182.3	1.0	0.55	1.2	0.2	-3.6	<0.01	MS
Sr Progesterone	4.5	5.6	1.1	24.4	1.4	0.31	-3.4	<0.01	MS
Assessment of follicular study	0.5	1.3	0.8	-16.0	1.04	0.23	-3.6	<0.01	MS
Apple Baum score	11.5	12.2	0.6	-6.09	0.58	01312	-4.9	<0.001	HS

Effect of Therapy on Objective Criteria Group 2: (BT vs AT)

Investigation	Mean score		Mean Difference	% Relief	SD	SE	t	P	Result
	BT	AT							
Oxidative stress (MDA)	1.93	1.91	0.02	1.04	0.15	0.034	0.66	<0.01	MS
Sr. Estrogen	181.3	181.1	0.2	0.11	1.0	0.2	1.0	>0.05	NS
Sr Progesterone	4.3	4.2	0.05	2.33	0.8	0.19	0.2	>0.05	NS
Assessment of follicular study	0.9	1.1	0.2	22.2	0.76	0.172	1.16	>0.05	NS
Apple Baum score	11.0	11.6	0.6	4.6	0.99	0.223	0.22	<0.01	MS

Effect of Therapy on Objective Criteria Group 3: (BT vs AT)

Investigation	Mean score		Mean Difference	% Relief	SD	SE	t	P	Result
	BT	AT							
Oxidative stress (MDA)	1.97	1.59	0.38	19.2	0.210	0.046	8.1	<0.001	HS
Sr. Estrogen	192.3	224.8	32.5	16.9	9.5	2.1	15.2	<0.01	MS
Sr Progesterone	4.9	15.7	10.7	22.4	1.9	0.42	25.0	<0.01	MS
Assessment of follicular study	0.7	3.0	2.3	32.5	0.92	0.2.	11.1	<0.01	MS
Apple Baum score	13.2	17.1	3.9	29.5	2.22	0.49	7.8	<0.001	HS

Intergroup comparison over criteria of Assessment

Effect of therapy on symptoms of group I and group II

Signs and symptoms	Mean score		Mean difference	SD±	SE±	't'	p	Remarks
	Group-I	Group-II						
Pain during menses	0.700	0.350	0.35	0.019	0.004	2.300	>0.01	NS
Amount of bleeding	7.45	7.25	0.20	2.412	0.539	0.088	>0.01	NS
Interval of menstrual cycle	17.7	11.7	5.95	0.957	0.214	1.890	>0.01	NS
Duration of menses	1.800	0.150	1.650	0.663	0.149	5.897	>0.01	NS
Dyspareunia	1.050	0.850	0.200I	0.358	0.08	0.804	>0.01	NS
Libido	1.00	0.280	0.72	1.686	0.377	2.65	>0.01	NS
Psychological evaluation test	12.050	7.550	4.500	0.036	0.009	3.535	<0.01	S

Balkshaya (Generalised weakness	2.850	1.600	1.250	2.202	0.492	1.6.9	>0.01	NS
Oxidative stress	1.935	1.910	0.00490	-0.08	-0.18	0.0490	>0.01	NS
S.Estrogen	0.350	0.450	0.10	0.664	0.149	1.844	>0.01	NS
S.progesterone	1.350	0.600	0.750	0.67	0.15	2.392	>0.01	NS
Follicular study	1.300	0.450	0.85	0.303	0.067	2.719	>0.01	NS
Applebaum score	0.752	0.750	0.002	0.195	0.0437	000.2	>0.01	NS

Effect of therapy on symptoms of group II and group III

Signs and symptoms	**Mean score**		**Mean difference**	**SD±**	**SE±**	**'t'**	**p**	**Remarks**
	Group-II	**Group-III**						
Pain during menses	0.350	1.550	1.200	0.021	0.005	7.58	<0.1	S
Amount of bleeding	7.25	7.650	0.400	2.617	0.585	0.180	>0.01	NS
Interval of menstrual cycle	11.7	22.1	10.3	1.221	0.274	2.962	>0.01	NS
Duration of menses	0.150	3.250	3.100	0.478	-0.107	12.79	>0.01	NS
Dyspareunia	0.850	2.050	1.200	0.099	-0.022	5.942	>0.01	NS
Libido	0.280	2.050	1.77	3.216	0.719	3.685	<0.01	S
Psychological evaluation test	7.550	16.15	8.600	0.299	0.066	6.497	>0.01	NS
Balkshaya (Generalised weakness)	1.600	11.30	9.700	0.854	0.191	19.40	>0.01	NS
Oxidative stress	1.910	1.597	0.343	0.021	0.047	3.813	>0.01	NS
S.Estrogen	0.450	15.300	14.8	29.9	6.69	2.147	>0.01	NS
S.progesterone	0.600	10.700	10.15	1.318	0.17	22.61	>0.01	NS
Follicular study	0.450	2.250	1.80	0.084	0.019	6.550	>0.01	NS
Apple Baum score	0.620	0.520	1.00	0.080	0.029	7.832	>0.01	NS

Effect of therapy on symptoms of group I and group III

Signs and symptoms	**Mean score**		**Mean difference**	**SD±**	**SE±**	**'t'**	**p**	**Remarks**
	Group-I	**Group-III**						
Pain during menses	0.700	1.550	0.850	0.040	0.009	5.478	>0.01	NS
Amount of bleeding	7.450	7.650	0.200	0.205	0.046	0.111	>0.01	NS
Interval of menstrual cycle	17.7	22.1	4.40	2.189	0.488	1.311	>0.01	NS
Duration of menses	1.800	3.250	1.450	0.185	0.042	4.313	>0.01	NS
Dyspareunia	0.850	2.050	1.200	0.259	0.058	1.00	>0.01	NS
Libido	1.000	2.650	1.650	1.53	0.342	2.032	>0.01	NS
Psychological evaluation test	12.05	16.15	4.10	0.338	0.075	3.103	>0.01	NS
Balkshaya (Generalised weakness)	2.850	11.30	8.450	1.348	0.301	9.866	<0.01	S
Oxidative stress	1.833	1.597	0.236	0.01	0.023	2.675	>0.01	NS
S.Estrogen	0.350	15.300	15.6	29.2	6.54	2.26	>0.01	NS
S.progesterone	1.350	10.750	9.400	0.648	0.144	18.2	<0.01	S
Follicular study	1.300	2.250	0.950	0.219	0.048	2.93	>0.01	NS
Apple baum score	0.700	4.000	-3.300	0.900	0.001	14.3	>0.01	NS

Effect of therapy on symptoms of Group I, Group II and Group III

Signs and symptoms	Mean score			F	P	Remarks
	Group-I	Group II	Group III			
Pain during menses	0.700	0.350	1.550	31.6	<0.01	S
Amount of bleeding	7.450	7.250	7.650	0.0181	>0.01	NS
Interval of menstrual cycle	17.7	11.7	22.1	4.40	>0.01	NS
Duration of menses	1.800	0.150	3.250	57.7	>0.01	NS
Dyspareunia	1.050	0.850	2.050	14.5	>0.01	NS
Libido	1.000	0.280	2.650	8.148	>0.01	NS
Psychological evaluation test	12.05	7.55	16.15	21.6	>0.01	NS
Balkshaya (Generalised weakness	2.850	1.600	11.30	5.25	>0.01	NS
Oxidative stress	1.833	1.910	1.597	7.622	>0.01	NS
S.Estrogen	0.350	0.450	15.300	4.858	>0.01	NS
S.progesterone	1.350	0.600	10.750	34.09	<0.01	S
Follicular study	1.300	0.450	2.250	17.4	>0.01	NS
Apple baum score	0.700	0.750	4.300	22.68	>0.01	NS

Overall Effect of therapy

Overall effect	Group 1		Group 2		Group 3	
	Patients	%	Patients	%	Patients	%
Good response (>75%)	15	75%	03	15%	16	80%
Fair response (50-75%)	05	25%	17	85%	04	20%
Poor response (25-49%)	0	0%	0	0%	0	0%
No response (<25%)	0	0%	0	0%	0	0%

DISCUSSION

Here, *Bandhyatva* is managed with the concepts of correcting the states of *Dhatu* and vitiated *Doshas*. *Shatpushpa Taila*, with its *Katu-Tikta Rasa*, *Laghu-Ruksha-Tikshna Guna*, *Ushna Veerya*, and *Katu Vipaka*, along with its *Vata-Kapha Shamaka Doshaghna* property (as detailed previously under drug review), leads to *Karmas* such as *Deepana*, *Pachana*, *Vilayana*, *Anulomana,* and *Strotoshodhana.* These actions result in *Āma Pachana* and *Vata-Kapha Shamana*, which may remove *Sanga* and *Avarana*, relieving obstruction and thereby restoring the proper function of *Vayu* and regulating the activity of the *Ārtavavaha Srotasa*.

The contents of *Shatpushpa Taila* possess properties such as *Balya* (strengthening the body), *Vrishya* (enhancing fertility), *Brimhana* (nourishing tissues), and most importantly *Artavajanana* (stimulating ovulation and promoting proper menstrual function). By virtue of its *Vata-Kapha Shamaka* property, *Shatpushpa Taila* removes *Sanga* and *Avarana* in the *Artavavaha Srotas*, thereby restoring the unobstructed flow of *Vayu* and ensuring proper regulation of reproductive functions. Its rejuvenating and fertility-enhancing qualities, combined with antioxidant and anti-inflammatory actions, help relieve oxidative stress and protect reproductive tissues from damage. These properties aid in the proper growth and recuperation of the endometrium, ensuring its thickness and receptivity for implantation and also ovulation. As timely ovulation denotes proper secretion of Serum Estrogen & Progesterone in proliferative and secretory phase of menstrual cycle that leads to the proper thickness and receptivity of endometrium.

Probable Mode of Action of *Ashwagandha Churan*

Ashwagandha Churna is described with *Tikta-Kashaya Rasa, Laghu-Snigdha Guna, Ushna Veerya,* and *Madhura Vipaka,* making it a potent *Vata-Kapha Shamaka.* In *Bandhyatva,* vitiated *Vata* and *Kapha* obstruct the *Artavavaha Srotas*, impairing ovulation and menstrual rhythm. *Ashwagandha* acts through:

- *Agnideepana* & *Pachana*→ Corrects *Mandagni*, digests *Āma*, and restores metabolic fire.

- *Srotoshodhana* → Clears channels, removes *Kapha Avarana*, and ensures unobstructed flow of *Apana Vata*.
- *Rasayana* & *Vajikarana* → Nourishes *Artava Dhatu*, enhances vitality, and promotes conception.

From a biomedical perspective, *Ashwagandha* (*Withania somnifera*) contains with anolides, alkaloids, and flavonoids that exert antioxidant, adaptogenic, and immunomodulatory effects. Its role in infertility and oxidative stress can be explained as follows:

- Reduction of Oxidative Stress→ *Ashwagandha* scavenges free radicals, enhances endogenous antioxidant enzymes (superoxide dismutase, catalase, glutathione peroxidase), and protects ovarian follicles and endometrial cells from oxidative damage.
- Hormonal Regulation→ It modulates the hypothalamic-pituitary-ovarian (HPO) axis, improving follicular growth, ovulation, and luteal function.
- Anti-inflammatory Action→ Suppresses pro-inflammatory cytokines (TNF-α, IL-6), reducing pelvic inflammation and improving uterine receptivity.
- Mitochondrial Protection→ Enhances mitochondrial function in oocytes, improving energy metabolism and reducing apoptosis.
- Stress Adaptation→ Its adaptogenic properties lower cortisol and stress-induced reproductive dysfunction, indirectly supporting fertility.
- By combining Ayurvedic *Rasayana* & *Artavajanana* actions with modern antioxidant and adaptogenic mechanisms, restores the balance of *Vata* and *Kapha*, reduces oxidative stress, rejuvenates reproductive tissues, and supports proper ovulation and implantation.

CONCLUSION

- This comparative analysis underscores that while all groups benefited from intervention, Group III (combined therapy) achieved the maximum result evidently and maximum psychological relief, thereby highlighting its superior efficacy in mitigating distress associated with infertility. The therapeutic effect on oxidative stress and Applebaum score was found to be moderately significant in Group II (*Ashwagandha Churna* orally), and highly significant in Group 1 (*Shatpushpa Taila Uttar Basti* and Group III (combined *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* orally).
- Also, there is more percentage relief in libido observed in Group III (62.3%) and Group II (53.5%), which received *Ashwagandha Churna* and *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* orally respectively compared to Group I which receive *Shatpushpa Taila Uttar Basti* only.
- The comparative evaluation of subjective and objective criteria predominantly revealed statistically non-significant differences across groups. However, certain parameters demonstrated significant therapeutic distinctions: In Group I vs Group II, the Psychological Evaluation Test showed a statistically significant improvement in Group I, indicating superior psychological relief.
- In Group II vs Group III, statistically significant differences were observed in pain during menses and libido, with Group III demonstrating better outcomes. In Group I vs Group III, significant improvement was noted in *Balkshaya* (generalized weakness) and Serum Progesterone, with Group III outperforming Group I. In the three-group comparison, statistically significant differences emerged in pain during menses and Serum Progesterone, where Group III exhibited superior therapeutic efficacy compared to both Group I and Group II.
- Thus, it can be concluded that the combined regimen of *Shatpushpa Taila Uttar Basti* and *Ashwagandha Churna* resides around *Vata-Kapha Shamana, Aam Pachana*, *Agni Vardhana, Uttaro-Uttar Dhatu Poshana, Artavavaha Srotoshuddhi*, and ultimately *Samyaka Artava Pravritti,* menstrual regularity and ovulation, which together lead to *Samprapti Vighatana* of *Bandhyatva* and proved effective in restoring reproductive balance and reducing oxidative stress, thereby offering a promising integrative approach in the management of female infertility.
- Psychological counselling remains the cornerstone in the management of infertility. By fostering calmness of mind, it effectively reduces cortisol levels, thereby alleviating stress. This neuroendocrine balance enhances HPO axis functioning, leading to timely ovulation and improved endometrial receptivity.

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