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Development and Assessment of Polyherbal Capsule for Treatment of PCOS

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ABSTRACT: The purpose of the study was to develop and evaluate the herbal capsule of ashwagandha and Brahmi, the capsule was prepared by manual capsule filling machine in which herbal drugs ashwagandha, Brahmi, shatavari, liquorice and methyl Para benzoate and propyl Para benzoate as a preservative used the capsule were evaluated by weight variation test, content uniformity, Disintegration test, dissolution test. That capsule are useful in the management of PCOS by act on female reproductive hormones, in case of PCOS reproductive hormones were imbalance, ashwagandha and Brahmi are those drugs which are used to treat polycystic ovarian syndrome (PCOS).

KEYWORDS: PCOS, Ashwagandha, Brahmi, Hirsutism, Cyst

I. INTRODUCTION

Polycystic ovary syndrome (PCOS) is one of the most common female endocrine disorders. It is recognized by the presence of enlarged ovaries with multiple small cysts and a hyper-vascularized, androgen secreting stroma. This syndrome is characterized by menstrual abnormalities, infertility, obesity, excess hair growth, acanthosis nigricans and acne. Polycystic ovary syndrome (PCOS) is a heterogeneous endocrine disorder that impacts many women of the reproductive age worldwide. This syndrome is often associated with enlarged and dysfunctional ovaries, excess androgen levels, resistance to insulin, etc. It is estimated that approximately every 1 in 10 women face PCOS before menopause and struggle with its complications. Polycystic ovary syndrome (PCOS), a disorder primarily characterized by signs and symptoms of androgen excess and ovulatory dysfunction, disrupts HPO axis function. In 1935, Stein and Leventhal reported a series of 7 women who presented with oligo/amenorrhoea, hirsutism, obesity, infertility, and bilateral polycystic ovaries (Stein-Leventhal syndrome).

Education and Counselling

Education and counseling about the condition is very important. The explanation and discussion of PCOS should be culturally sensitive as well as appropriate, comprehensive, and tailored to the individual. This discussion should use an empathetic approach, promote self-care, and highlight peer support groups, which are available in multiple countries. Counseling about fertility concerns is important, as adolescents with PCOS are more concerned than their peers about future fertility after diagnosis.

- ✚ No universal treatment for PCOS is available
- ✚ Treatment is individualized, based on:
 - ✚ Woman's goal
 - ✚ Severity of symptoms
 - ✚ Modalities include:
 - ✚ Conservative
 - ✚ Medical
- ❖ **Medical management aims to**
 - ✚ Lower insulin levels
 - ✚ Restore regular menstruation
 - ✚ Restore fertility
 - ✚ Treat hirsutism or acne,
 - ✚ Prevent endometrial hyperplasia and endometrial cancer.



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❖ Restoration of ovulation/menstruation

- ✚ Combined Oral Contraceptive Pills
- ✚ Suppress gonadotropin release
- ✚ Reduce androgen levels
- ✚ Induce regular menstrual cycles
- ✚ Cyclic progestogens
- ✚ When COCP is contraindicated (e.g. MPA)
- ✚ Intrauterine progestogen device (IUS or implants)
- ✚ Insulin sensitizing agents

❖ Insulin resistance / hyperinsulinaemia

➤ Metformin

- improves peripheral insulin sensitivity by reducing hepatic glucose production
- increases target tissue sensitivity to insulin
- decreases androgen levels
- helps spontaneous ovulation

➤ Thiazolidine

- improves entry of glucose into muscle and fat

❖ Treatment of hirsutism

- ✚ COCP
- ✚ Lowers androgen level
- ✚ Oestrogen component increases SHBG
- ✚ Eflornithine hydrochloride
- ✚ GnRH agonists
- ✚ Antiandrogens (e.g. spironolactone, cyprotene acetate, flutamide)
- ✚ 5α reductase inhibitor (e.g. finasteride)
- ✚ Hair removal - depilation, epilation

❖ Treatment of acne

- ✚ COCP
- ✚ Topical Retinoids
- ✚ Topical Benzoyl Peroxide
- ✚ Topical and Systemic Antibiotics
- ✚ Isotretinoin

❖ Alternative medicine

- ✚ Acupuncture
- ✚ Helps menstrual regulation
- ✚ Decreases body weight
- ✚ Reduces headache
- ✚ Improves mood

❖ Surgeries

❖ Ovarian wedge resection (rarely done)

❖ Oophorectomy (rarely done)

- ✚ When fertility is not desired and symptoms are severe

❖ Laparoscopic ovarian drilling (laser, electrocautery, multiple biopsy)

- ✚ For clomiphene resistant
- ✚ Mechanism unclear
- ✚ May be due to destruction of androgen producing stroma ^[6]



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II. MATERIALS AND METHOD

Materials: There are many herbal drugs are used in the formulation of herbal capsule i.e. Ashwagandha, Shatavari, Cinnamon, Turmeric, Liquorice which are collected from local market and some excipients which are used in the formulation that are available in Parijat college of pharmacy, Indore.

Method:

Extraction Methods of Herbs: Preparation of ethanolic, acetonetic and aqueous extracts of ARP (Ashwagandha Root Powder) The powdered Ashwagandha root samples (50 g/250 ML) were extracted successively with methanol, acetone and water using 6376oxhlet apparatus at 55-850C for 8-10 h in order to extract the polar and non-polar compounds.

Herbal capsule ingredients:

S.No.	Name of Ingredients	Quantity required		
		F1	F2	F3
01.	Ashwagandha	100mg	100mg	100mg
02.	Turmeric	100mg	100mg	100mg
03.	Shatavari	100mg	100mg	100mg
04.	Liquorice	125mg	125mg	125mg
05.	Cinnamon	75mg	75mg	75mg
06.	Starch	42.5mg	42.5mg	42.5mg
07.	Magnesium Stearate	5mg	5mg	5mg
08.	Lactose	100mg	100mg	100mg

Table: Formulation of polyherbal capsule Procedure for formulation of herbal Capsule:

1. The first step is to place the encapsulation plate on top of the cap plate.
2. Place the encapsulation plate on top of the body plate.
3. Adjust the powder guard over the body plate in the third step. It will help in avoiding the fall of powder by the sides.
4. Fill the powder appropriately on the body plate with the use of a spreader.
5. Take the help of a tamping plate if the bottoms are not filled enough.
6. If still the bottoms are not filled, use the tamping plate.
7. The following step is to remove the filled cap plate and place the middle sheet on the top. (NOTE: the hole with the bigger diameter of the middle sheet faces the cap plate.)
8. Now, place both your hands on the top. Apply the equal push downwards and ensure the bodies and caps match together before direct press down.
9. Capsule filling Is done by using. Manual capsule filling machine.

Evaluation of herbal capsule

- a) **Description:** Size, shape, colour etc were evaluated (Lachman et al., 1987).
- b) **Uniformity of weight:** Test for uniformity of weight was performed as per Indian pharmacopoeia, 1996.
- c) **Determination of pH:** The test was performed same as earlier in the case of pH determination for extract. Here powder of one capsule was used.
- d) **Disintegration test for capsule:** Disintegration test was performed using the digital micro-processor based



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disintegration test apparatus. One capsule was introduced into each tube and added a disc to each tube. The assembly was suspended in the water in a 1000 ml beaker. The volume of water was such that the wire mesh at its highest point is at least 25 mm below the surface of the water, and at its lower point was at least 25 mm above the bottom of the beaker. The apparatus was operated and maintained the temperature at $370 \pm 20^\circ\text{C}$. Noted down the time require to all capsules to disintegrate and pass through wire mesh.

- e) **Disintegration test for capsule:** Disintegration test was performed using the digital micro-processor based disintegration test apparatus. One capsule was introduced into each tube and added a disc to each tube. The assembly was suspended in the water in a 1000 ml beaker. The volume of water was such that the wire mesh at its highest point is at least 25 mm below the surface of the water, and at its lower point was at least 25 mm above the bottom of the beaker. The apparatus was operated and maintained the temperature at $370 \pm 20^\circ\text{C}$. Noted down the time require to all capsules to disintegrate and pass through wire mesh.

III. RESULT AND DISCUSSION

The poly herbal Capsule of Ashwagandha, Turmeric, Shatavari, Liquorice and Cinnamon was prepared by manual capsule filling method. In this method the herbal extract of Ashwagandha, Turmeric, Shatavari, Liquorice and Cinnamon with some preservatives like Lactose, magnesium stearate and starch. Finally, the three formulation was prepared i.e. F1, F2, F3. And all the formulation was evaluated by various parameters like; physical evaluation, weight variation, disintegration, dissolution. The results of evaluation parameters are done and described in the table.

Organoleptic properties:

Ashwagandha is one of the most revered plants in traditional Ayurvedic medicine in India. It is an erect, greyish, subshrub with inconspicuous yellow or greenish flowers followed by small, spherical, orangish- red berries containing yellow, kidney shaped seeds. It grows three to five feet tall, mainly on waste land, but is cultivated widely as the whole plant. Most commonly the root and leaf are used medicinally.

Aswagandha: It is used as a general health tonic for elderly persons and lactating women. It is known for antiseptic properties and can be used as narcotic anti- epileptic, against female sterility.

Synonym: Withania somnifera

Family: Solanaceae

Common name: Asgandh Parts used: dried roots

Shape: smaller size, straight unbranched

Colour: outer surface is buff to grey yellow with wrinkles

Odour: characteristics Taste: bitter and acrid

Brahmi: It has various medicinal properties like an anti-inflammatory, analgesic, antipyretic, sedative, antiepileptic and antioxidant, immuno-modulatory, memory enhancing, anti-stress, antianxiety, and anticancer.

Family: Scrophulariaceae **Common name:** Brahmi **Colour:** Bright green **Odour:** Characteristics

Shape: Leaves: sessile, succulent, opposite, obovate-oblong

Botanical Description: The plant is a shrub growing to around 3–4 feet. It is usually erect and tomentose. The leaves of Ashwagandha are simple, ovate, exstipulate, glabrous and petiolate. The margin of the leaves is complete with acute to thick apex and cuneate or oblique base. The leaves are large and arranged alternate on the vegetative shoot but are opposite on floral branches

➤ Therapeutic Uses of Ashwagandha

Recent scientific studies have validated many of the traditional uses of Ashwagandha and explored its mechanisms of action. Some notable findings include:

a) Stress Reduction

Several studies have demonstrated Ashwagandha's ability to reduce stress levels by regulating the HPA axis and reducing cortisol, the stress hormone. These effects make it valuable in managing stress-related disorders.

b) Antioxidant Effects

Ashwagandha's antioxidant properties help protect cells from oxidative damage caused by free radicals. This may have implications for various chronic disease.

c) Immune Modulation

Research has shown that Ashwagandha can enhance immune function by increasing the activity of immune cells such



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as lymphocytes and natural killer cells.

d) Anti-Inflammatory Properties:

Ashwagandha's anti-inflammatory effects have been attributed to its ability to inhibit pro-inflammatory cytokines, making it potentially useful in managing inflammatory conditions.

e) Enhancing Cognitive Function:

It is believed to have neuroprotective effects, supporting brain health and cognitive function. Some studies suggest that ashwagandha may improve memory, focus, and attention, making it beneficial for those with cognitive decline.

Flow Properties

Bulk and Tapped density: Bulk density measurement carried out by using flat- round measuring cylinder with a volume of 100 ml.

Angle of repose: It was determined by fixed funnel method onto a bottom graph paper. The funnel was fixed on a height, and moved according to the height of the conical heap in order to keep a constant distance between the top of the heap and the funnel.

Flow Properties	Result				
	Ashwagandha	Turmeric	Cinnamon	Shatavari	Liquorice
Bulk Density(g/ml)	0.41 g/ml	0.45 g/ml	0.56g/ml	0.27 g/ml	0.41 g/ml
Tapped Density	0.61 g/ml	0.62 g/ml	0.43 g/ml	0.37 g/ml	0.54 g/ml
Carr's Index	25.45 %	27.5 %	17.6 %	27.02 %	25.45 %
Hausner's Ratio	1.34 g/ml	1.37 g/ml	1.21 g/ml	1.37 g/ml	1.34 g/ml
Angle of Repose	27.80° (Good flow)	33° (Good flow)	34° (Good flow)	37° (Fair Flow)	27.80° (Excellent flow)

Table: Flow properties

Weight Variation:

Weight variation is done by weighing balance data is mention in below table:

Sr No.	F1(mg)	F2(mg)	F3(mg)
1	460	480	480
2	470	480	470
3	480	480	460
4	470	490	460
5	470	470	480
6	480	480	480



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7	490	470	470
8	480	460	480
9	470	480	490
10	490	470	470
11	480	450	460
12	470	460	450
13	460	450	460
14	450	470	470
15	460	480	480
16	480	480	490
17	470	470	470
18	470	470	460
19	490	480	450
20	480	490	480

Table: Table of Weight Variation

Disintegration test for capsule:

Disintegration test was performed using the digital micro-processor \based disintegration test apparatus by VEEGO. One capsule was introduced into each tube and added a disc to each tube. The assembly was suspended in the water in a 1000 ml beaker.

Formulation	Time (min)
F1	30
F2	30
F3	30

Table: Disintegration test



Fig.: Distegration and Dissolution test



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Fig.: Formulation

IV. SUMMARY AND CONCLUSION

The polyherbal capsules including Ashwagandha, Turmeric, Shatavari, Liquorice and Cinnamon were aimed to treat the PCOS or any type of symptoms of PCOS like hirsutism, infertility etc. In the various research it's seen that Ayurveda interventions with Ashwagandha, Turmeric, Shatavari, Liquorice and Cinnamon had a beneficial role in the management of PCOS. This activity may be attributed to the multiple pharmacological activities like estrogenic, antihyperlipidemic, hypoglycemic and antioxidant activity of various phytoconstituents present in the polyherbal formulation which could be useful in the effective management of PCOS and thereby preventing ovarian cell dysfunction and improving fertility. Together broad spectrum of the biological effects of polyherbal formulation makes it a promising alternative for treating clinical and pathological abnormalities in PCOS conditions

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REFERENCES

- 1) Yasin M, Yasmeen F. Polycystic ovarian syndrome; pattern of disease in patients, The Professional Medical Journal, 2014, page no 179-184
- 2) Mohammad H.S., Adeli I., Calina D., Mousavi T., Marzieh D., and Mohammad A., Polycystic Ovary Syndrome: A Comprehensive Review of Pathogenesis, Management, and Drug Repurposing, International Journal of Molecular Sciences, 2022, page no 1-33.
- 3) Dr. Madnani N., Khan K., Chauhan P., Parmar G., Polycystic ovarian syndrome, Indian Journal of Dermatology, Venereology, and Leprology, vol 79, 2013, page no. 310-321.
- 4) Angie E., Robinson M. G., Polycystic Ovary Syndrome A Review of Treatment Options with a Focus on Pharmacological Approaches, P&T, Vol. 38No. 6, June 2013, page no 336-355.
- 5) Arun Kumar Pal., et al. A Review on Health Care Surveillance of PCOD, PriMera Scientific Medicine and Public Health, 2023, page no. 03-15.
- 6) Kabel A. M., Polycystic ovarian syndrome: insights into pathogenesis, diagnosis, prognosis, pharmacological and nonpharmacological treatment, Pharm. Bioprocess. 2016, page no. 7–12.



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- 7) Prajapati D, published by Journal of health management, Development & evaluation of Polyherbal formulation for Polycystic Ovarian Syndrome, Jun 2022.
- 8) Sudhakar P, published by science direct, Formulation against Letrozole induced PCOS in Rats updated on May 2023, page no. 1-19
- 9) Arentz S, Smith C.A, published by Biomed center, Herbal medicine for the management of Polycystic Ovary Syndrome and associated with oligo/amenorrhea and hyperandrogenism; review of the laboratory evidence for effects with corroborative clinical findings, Aug 2014, page no 1-19.
- 10) Roy R.K, published by International journal of homeopathic science, Efficiency of homeopathic treatment in case of PCOS, May 2023, page no 505-510.
- 11) Dehparvar N, Mohammad G, published by Avicenna journal of phytomedicine, vol 14 June 2024 page no.278.
- 12) Legro RS., *et.al*, The Journal of Clinical Endocrinology & Metabolism (2013).
- 13) Anjali C.S., *et.al*, published by World Journal of Pharmaceutical Research, PCOD in female Reproductive age -A Review, volume 09, Oct 2019.
- 14) Wang Y., Peter Leung, Rong Li, Yanting Wu, and Hefeng Huang, Polycystic ovary syndrome (PCOS): Mechanism and management, Frontiers in Endocrinology, 2022, Page no 01-04.
- 15) Deshmukh R., Gajbe H., Dr Sankhe A., Research OF POLYCYSTIC OVARIAN SYNDROME(PCOS), World Journal of Pharmaceutical and Medical Research, 2022, Page no 215-226.
- 16) Zhao H., Zhang J., Cheng X., Nie x., Insulin resistance in polycystic ovary syndrome across various tissues: an updated review of pathogenesis, evaluation, and treatment, Journal of Ovarian Research 2023, Page no 1-17.
- 17) Kurdukar and Jogdand, Brief Review on Shatavari (*Asparagus racemosus*) and Its Medicinal Uses, Journal of Pharmaceutical Research International, 2021; Page no 1552-1559.
- 18) Sasikala R, Shanmugham D, Varghese J, Saravanan DK. A study of knowledge and awareness on polycystic ovarian syndrome among nursing students in a tertiary centre in South India. The New Indian Journal of OBGYN., 2021, Page no 121-25.



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