EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 7
Issue: 9
102-105
Year: 2020

POLYHERBAL FORMULATION AS AN ALTERNATIVE TREATMENT FOR POLYCYSTIC OVARIAN SYNDROME

Adeeba Usmani[1]* and Aamir Khan Yusuf Khan[2]

[1]Student, Deccan School of Pharmacy, [2]Assistant Professor, Deccan School of Pharmacy, Department of Pharmacology, Darussalam, Aghapura, Hyderabad-500001, Telangana, India.

***Corresponding Author: Adeeba Usmani**
Department of Pharmacology, Government Medical College, Haldwani, Nainital, Uttarakhand, India-263139.

Article Received on 15/06/2020 **Article Revised on 05/07/2020** **Article Accepted on 26/07/2020**

ABSTRACT
Polycystic Ovarian Syndrome (PCOS) is a complex endocrine and metabolic disorder affecting 5-10% of the females of reproductive as well as pre-menopausal age. It is indicated by menstrual cycle disturbances, acne, hirsutism, obesity and high testosterone levels. Polycystic Ovarian Syndrome can be managed by herbal therapy because of its lesser side effects, low cost, easy availability and presence of multiple herbs in a formulation which gives the best results as conventional therapy is not so effective. This study helps to examine the reproductive endocrine effects in PCOS. The focus of the article is mainly concerned with PCOS that can be tested by polyherbal formulation.

KEYWORDS: Polycystic Ovarian Syndrome, Polyherbal Formulation, Pharmacological Action, Menorrhagia, Dysmenorrhea, Ayurvedic Importance, Medicine of India, Ashoka, Dhaiphool.

1. INTRODUCTION

Polycystic ovary/ovarian syndrome (PCOS) is a set of symptoms associated with an imbalance of hormones that can affect the females of reproductive age. It is indicated by a combination of signs and symptoms of androgen excess, ovarian dysfunction *(Stein I.F et al., 1935).*

However, not all women with polycystic ovaries exhibit the clinical and biochemical features which define the syndrome of PCOS. These features include menstrual cycle disturbances, obesity, hirsutism, acne, and abnormalities of biochemical profiles including elevated serum concentrations of LH, testosterone, androstenedione, and insulin *(Balen, A.H., 1999).*

In women, though, even slightly elevated levels of androgens can cause the ovaries to prevent producing mature follicles, the small cystic incubators for developing eggs. Each month, follicles attempt to grow in an exceedingly normal fashion, but become arrested in their growth if exposed to inappropriate amounts of androgens. Over longer periods of time, the underdeveloped follicles build up in the ovary, resulting in a polycystic appearance. The positive feedback of "hyperandrogenism" and "anovulation" (lack of ovulation) tends to worsen over time. Women with long-standing PCOS have high risk for infertility, menorrhagia, pre-cancerous and cancerous changes within the uterus, hirsutism, acne, diabetes, lipid abnormalities, and possibly coronary heart disease. This syndrome can affect adolescents, females of childbearing and post- menopausal age. Women of virtually all ethnic backgrounds are also affected, arguing against a single gene abnormality. The syndrome does tend to run in families, however, suggesting a hereditary pre-disposition *(Ronald F.).*

Polycystic ovaries are commonly detected by ultrasound or other varieties of pelvic imaging, with estimates of the prevalence within the general population being within the order of 20–33% *(Polson, D.W.et al., 1988; Clayton R.N. et al., 1992; Farquhar C.M. et al., 1994; Michelmore K.F. et al., 1999).*

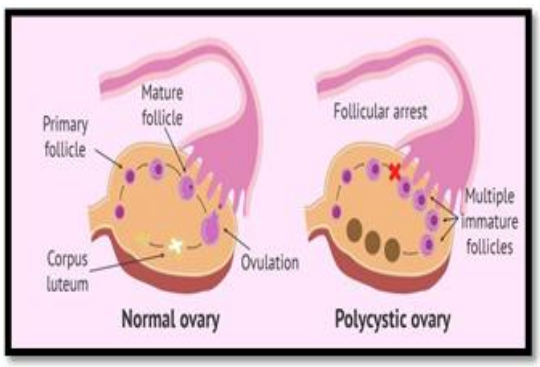

Figure 1: Difference between Normal and Polycystic Ovary.

2. AYURVEDA AND GYNECOLOGICAL PROBLEMS

The word 'Ayurveda' is taken from two Sanskrit terms where *Ayur* means life, while *Veda* converts into science. The principle of Ayurveda states that the mind and body are connected and also the mind has the ability to heal and transform a person's whole being. Medical systems like Ayurveda which is the most preferred health system of India that are rooted in knowledge and availability of medicinal plants and herbs is the major component of contemporary medicine, and play an increasingly crucial role in modern cultures. Plants are identified from the available traditional literature on Ayurveda. Remedies for the subsequent disorders were noted: amenorrhea, dysmenorrhea, emmenogogue, leucorrhea, metrorrhagia, menstrual disorder, post partum bleeding, irregular menstruation, uterine pain, vaginal pain, uterine tonic, cleaning uterus. Ayurveda continues to evolve because it responds to the recognition of recent diseases and provides a good alternative for people who cannot afford the price demanded by modern medical treatment due to socio-economic factors. Hence, the Ayurveda has answer to several diseases including PCOS and can be tested by polyherbal formulation *(Jadhav A.N et al., 2005).*

POLYHERBAL FORMULATION – ACTIFEM

The blend of the Herbs employed in Actifem (SIDDHAYU Ayurvedic Research Foundation Pvt. Ltd.) for e.g. Saraca indica and Symplocos racemosa provides estrogen like activity, which improves the repair of endometrium and helps to arrest the bleeding.

Actifem regulates and restores normal menstrual blood. It is useful in irregular menstrual cycles and helps to lessen menorrhagia. Improves blood supply to pelvic organs and reduces the inflammation of uterus and also useful in pelvic inflammatory diseases. It is useful in leucorrhea. It has relaxation action useful in relieving dysmenorrhea. It improves the general health of females. It also corrects the hormonal imbalance in menopausal phase *(Dr. Veena).*

SOME IMPORTANT PHARMACOLOGICAL ACTIONS OF HERBS IN ACTIFEM

Important pharmacological actions of some of the herbs in ACTIFEM are.

1. **Ashoka (*Saraca indica*):**
   - Anti-inflammatory
   - Anti-menorrhagic
   - Uterine tonic
2. **Dhaiphool *(Woodfordia fruticosa)***:
   - Anti-fertility
   - Anti-inflammatory
   - Anti-hyperglycemic

2.1 ASHOKA (*Saraca indica)*

BIOLOGICAL SOURCE: Ashoka is one among the foremost legendary and sacred trees of India. Ashoka tree, known by its binomial name *Saraca asoca (Roxb.), De.wild or Saraca indica* belonging to the family *leguminaceae.*

CHEMICAL CONSTITUENTS: Constituents present in the stem bark of Asoka are ash (2.43%–6.69%), tannins (0.57%– 7.85%), and other extracts (5.74%–14.07%). Seed and pod contains oleic, linoleic, saturated fatty acids such as palmitic, and stearic acid, catechol, epicatechol, and leucocyanidine. Leaves and stem contains quercetin, quercetin-3-O-α-L-rhmanoside, kaempferol 3-O-L- rhamnoside, amyrin, ceryl alcohol and ß-sitosterol. An outsized variation has been observed within the quality of Asoka crude drug collected from important markets within the country. Age factor may probably be accountable for such quality variations *(Angad Verma. et al., 2010).*

Figure 2: Ashoka Leaves.

PHARMACOLOGICAL ACTIVITY

❖ ***Anti-inflammatory Activity***

The ethanolic extract of *Saraca indica* leaves detect the anti-inflammatory activity. The leaves of *Saraca indica* determined the anti-inflammatory activity against Carrageenan induce paw edema in animal is best suited test procedure to screen anti-inflammatory activity. The ethanolic extracts of *Saraca indica* reduce the paw edema significantly. The plant extract at dose of 200 mg/kg detected significant anti-inflammatory activity. It caused 56.95% inhibition in increase paw volume, though of a short duration and intensity, as compare thereto of 10 mg / kg diclofenec *(Shelar DB. et al., 2010).*

❖ ***Anti-menorrhagic Activity***

Ashoka dried bark has been employed in India for menorrhagia *(B. Middelkoop et al., 1986; M J. Bhandary et al., 1995). Saraca asoca* dried bark and flowers are given as a tonic in case of uterine disorder to women in India. *Saraca asoca* stem bark is additionally employed to treat all the disorders related with menstrual cycle *(Y. Kumar et al., 1980; T. B. Middelkoop et al., 1985).* In Sri Lanka, Ashoka bark is employed for menstrual disorders and in menorrhagia *(T. B. Middelkoop et al., 1985; G. V.*

Satyavati et al., 1970). In India, *Saraca asoca* bark is employed as a uterine sedative and its extract to stimulate the uterus just like ergot, but without producing tonic contractions. Also given in menorrhagia, as an emmenagogue, uterine sedative, uterine affections moreover as employed in many preparations related to female disorders *(J. C. Saha et al., 1961; C. R. Karnick et al., 1970; M. A. Khan et al., 1994; D. John, 1984).* In Pakistan, *Saraca indica* bark is employed to cure uterine affection and menorrhagia. In India, dried bark of *Saraca asoca* is employed as an astringent to prevent excessive uterine bleeding *(S. P. Son, 1963).* Extract of the bark is reported to contain active compounds; one is stimulating while the alternate is relaxing the plain muscles of ileum in guinea pig. The drug is found to stimulate the uterus, and makes the contractions more frequently and prolonged. The crystalline glycoside substance is reported to stimulate the uterine contractions *(M. Ali, 2003).*

❖ ***Uterine Tonic Activity***

In Ayurvedic medicine *Saraca asoca* could also be a drug of choice for its stimulant activity on the endometrium and ovarian tissue. The estrogenic effect of U- 3107 (1mg/kg p.o) was studied in healthy and overiectomised rats. U-3107 is an aqueous suspension was administered for a period of 21 days. The management of overiectomised rats failed to expand on uterine weight. U-3107 performs the estrogenic activity within the presence of functional ovary and lacks the progestational activity. U-3107 could also be a herbal preparation which is formulated by using various plant extract and is beneficial in many kinds of menstrual disorders like puberty, menorrhoea, Dysmenorrhoea, premenstrual syndrome, abnormal bleeding and stillbirth *(S. K. Mitra et al., 1999).*

2.2 DHAIPHOOL (*Woodfordia fruticosa)*

BIOLOGICAL SOURCE: It is a widely used medicinal herb which consist flowers of *Woodfordia fruticosa* belonging to the family Lythraceae *(Oudhia P, 2003).*

CHEMICAL CONSTITUENTS: *Woodfordia fruticosa* are predominantly reported to contain phenolics, particularly hydrolysable tannins and flavonoids. Flowers as well as practically the whole plant yields tannins up to 20 percent. The flowers and leaves were found to contain polyphenols- ellagic acid, polystachoside and myricetin-3- galactoside. Flowers also contained anthocyanins-pelargonidin- 3,5-diglucoside and cyanidin-3,5-diglucoside, octacosanol, P-sitosterol and chrysophanol-8-O- PD-glucopyranoside. Hecogenin, mesoinositol and flavone glycosides-quercetin-3- rhamnoside, naringenin-7-glucoside and kaempferol are also reported from flowers *(Chauhan JS et al., 1979b).*

Figure 3: Dhaiphool.

PHARMACOLOGICAL ACTIVITY

❖ ***Anti-fertility Activity***

Anti fertility activity is determined in female albino rats by employing various extract of dried flowers of *W. fruticosa*. The ethanolic extract of the dried flowers powder was prepared by extracting successively with petroleum ether, chloroform, benzene, and ethanol and was also extracted individually with 50% aqueous alcohol and water. Anti fertility activity of successive alcoholic, aqueous and hydro alcoholic extracts was studied in female albino rats. The results showed that the alcoholic extract possessed significant abortifacient activity, whereas aqueous and hydro alcoholic extracts showed moderate activity as compared to the control. Thus, the successive alcoholic extract showed promising abortifacient activity at 100kg/mg weight of the body *(Kushlani H et al., 2006).*

❖ ***Anti-inflammatory Activity***

Anti-inflammatory activity was determined by two doses (400 and 600 mg/Kg) against the carrageenan, histamine, dextran, serotonin and formaldehyde-induced rat paw edema, cotton pellet induced granuloma and formaldehyde-induced analgesia in rats. The extract showed significant ($p < 0.05$) decrease in paw volume in different models of paw edema and also inhibited the formation of granuloma in cotton pellet induced granuloma and reduced the frequency of formaldehyde-induced paw licking. These results revealed that the methanol extract of *W. fruticosa* flowers have potent anti-inflammatory compounds and confirms the traditional uses for the treatment of inflammatory conditions *(Baravalia Y et al., 2012).*

❖ ***Anti-hyperglycemic Activity***

After 21 days treatment in streptozotocin diabetic rats, the ethanolic extract of *W. fruticosa* flowers (250 and 500mg/kg) significantly reduced fasting blood glucose level and increased insulin level was observed. The extract also reduced lipid peroxidation and increased superoxide dismutase, glutathione reductase, catalase, glutathione peroxidase activities significantly. In ethanolic extract treated diabetic rats, increase in glycolytic enzymes while a decrease was observed in the levels of the gluconeogenic enzymes. In streptozotocin

induced diabetic rats, the extract also had a favorable effect on the histopathological changes of the pancreatic β-cells. The results revealed that the extract of *W. fruticosa* flowers possess potential anti-hyperglycemic effect by regulating glucose homeostasis *(Verma N et al., 2012).*

CONCLUSION

Pre-clinical studies provide preliminary evidence that herbal medicines may have beneficial effect for women with oligo/amenorrhea, hyperandrogenism and PCOS. Polyherbal formulation is a blend of various herbs which is traditionally used in female gynecological problems. Herbs like Ashoka, which contain phytoestrogen, Lodhra has anti-androgenic activity which helps in balancing hormone. The present article concludes that the use of polyherbal formulation from reviewing different studies is a better option for PCOS with lesser side effects.

REFERENCES

1. Actifem Product Manual by Dr. Veena.
2. Baravalia Y, Kumar YV, Chanda S. Brine shrimp cytotoxicity, anti inflammatory and analgesic properties of *Woodfordia fruticosa kurz* flowers. Iran J Pharm Res, 2012; 11: 854-861.
3. Balen, A.H. The pathogenesis of polycystic ovary syndrome: the enigma unravels. *Lancet*, 1999; 354: 966–967.
4. B. Middelkoop and R. P. Labadie. Int. J. Crude Drug Rec, 1986; 24(1): 41-44.
5. Borokar A. A.1* ,, International journal of ayurvedic & herbal medicine, March.-April 2017; 7(2): 2524-2.
6. Chauhan JS, Srivastava SK, Srivastava SD. Chemical constituents of the flowers of *Woodfordia fruticosa linn.* Journal of Indian Chemical Society, 1979b; 56: 1041.
7. Clayton, R.N., Ogden, V., Hodgkinson, J., Worswick, L., Rodin, D.A., Dyer, S. and Meade, T.W. How common are polycystic ovaries in normal women and what is their significance for the fertility of the population? *Clin. Endocrinol. (Oxf.)*, 1992; 37: 127– 134.
8. C. R. Karnick. Acta Phytother, 1970; 17: 181.
9. C. John. International Journal of Crude Drug Research, 1984; 22(1): 17-39.
10. Farquhar, C.M., Birdsall, M., Manning, P. and Mitchell, J.M. Transabdominal versus transvaginal ultrasound in the diagnosis of polycystic ovaries in a population of randomly selected women. *Ultrasound Obstet. Gynecol*, 1994; 4: 54–59.
11. G. V. Satyavati, D. N. Prasad et al.Ind. Journal of Medical Research, 1970; 58: 947.
12. Jadhav A.N, Bhutani K.K. Ayurveda and gynecological disorders. Journal of Ethanopharmacology, 2005; 97: 151-159.
13. J. C. Saha, E. C. Savini and S. Kasinathan. Ind. Journal of Medical Research, 1961; 49: P.130-151.
14. Kushlani H, Tatke P, Singh KK. Antifertility activity of dried flowers of *Woodfordia fruticosa Kurz.* Indian Journal of Pharmaceutical Sciences, 2006; 68: 512- 529.
15. Michelmore, K.F., Balen, A.H., Dunger, D.B. and Vessey, M.P. Polycystic ovaries and associated clinical and biochemical features in young women. *Clin. Endocrinol. (Oxf.)*, 1999; 51: 779–786.
16. M. A. Khan, T. Khan and Z. Ahmad. Fitoterapia, 1994; 65(5): 444-46.
17. M. Ali. Pharmacognosy and Phytochemistry. Career publication. Nashik, 2003; 269-270.
18. M J. Bhandary, K. R. Chandrasekhar and K.M.K averiappa. J. Ethnopharmacol, 1995; 47(3): 149-158.
19. Oudhia P. Interaction with the Herb Collectors of Gandai Region, Chhatisgarh, MP, India, 2003.
20. Pharmacological Evaluation of Saraca indica Leaves for Central Nervous System Depressant Activity in Mice / Angad Verma, Goutam Kr. Jana, Saikat Sen*, Raja Chakraborty, Sandeep Sachan, Ashutosh Mishra J. Pharm. Sci. & Res, 2010; 2(6): 338-343.
21. Polson, D.W., Adams, J., Wadsworth, J. and Franks, S. (1988) Polycystic ovaries–a common finding in normal women. *Lancet*, i, 870–872.
22. Ronald F. Feinberg M.D., Ph.D. Shelar DB, Shirot PJ and Naik NS. anti-inflammatory activity and brine shrimps lethality test of Saraca indica leaves extract. journal of pharmacy research, 2010; 3(8): 2004-2006.
23. Stein I.F., Leventhal M.L. Amenorrhea associated with bilateral polycystic ovaries. Am J Obstet Gynecol, 1935; 29: 181–191.
24. S. K. Mitra, S. Gopumadhavan et al. Uterine tonic activity of U-3107(even care), a herbal preparation in rats. Indian Journal of Pharmacology, 1999; 31: 200-203.
25. S. P. Son. Curr Sci, 1963; 32: 502-503.
26. S. B. Middelkoop and R. P. Labadie. Z. Naturforch Ser, 1985; 40(6): 855-57.
27. T. B. Middelkoop and R. P. Labadie. Z. Naturforch Ser c 40, 1985; 718: 523-26.
28. Verma N, Amresh G, Sahu PK, Rao V, Singh AP. Antihyperglycemic activity of *Woodfordia fruticosa Kurz* flowers extracts in glucose metabolism and lipid peroxidation in streptozotocin induced diabetic rats. Indian Journal of Experimental Biology, 2012; 50: 351- 358.
29. Y. Kumar, K. Haridasan and R. R. Rao. Bull. Bot. Surv. India, 1980; 22(1/4): 161-65.