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Management of Polycystic ovary syndrome using drugs of herbal origin

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ABSTRACT

Background and Aim: Polycystic ovarian syndrome (PCOS) is a complex syndrome that has significant clinical implications for reproductive, metabolic and psychological health. However conventional therapies can lead to intolerable side effects in PCOS. PCOS has no satisfactory treatment till now and most often patients get only symptomatic treatment with hormones and insulin sensitizers, and become drug-dependent in the long term. Unani physicians have recommended regular induction of menstruation, Correction in insulin levels, etc. as treatment modalities. This poster aims to systematically review the management of polycystic ovary syndrome using drugs of herbal origin. **Materials and Methods:** We conducted an exclusive search using various electronic databases such as PUBMED, BMJ, LANCET, WHO Website, Unicef Website and Google Scholar for studies related to Polycystic Ovary Syndrome and various drugs showing promising results in the management of polycystic ovary syndrome. **Results:** Many studies across the world have confirmed that PCOS can be treated with herbal remedies and lifestyle management. Unani physicians have recommended regular induction of menstruation as one of the treatment modalities applied for women who have developed masculine features suggestive of PCOS. Management based on correction of temperament, menstrual regulation by use of emmenagogue drugs and local application of herbs to reduce the severity of hair growth, acne and hyperpigmentation due to PCOs have also been reported. **Conclusion:** Preclinical and clinical studies have provided preliminary evidence that herbal medicines may have beneficial effects for women with PCOS. In addition, alternate therapeutic protocols have been followed to improve the quality of life in these patients. However Further investigations into the mechanisms of effect for herbal extracts are needed to complete our understanding of the reproductive endocrinological effects of herbal medicine for this condition.

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INTRODUCTION

Polycystic ovary syndrome (PCOS) is a heterogeneous endocrine disorder, that leads to several health complications, including menstrual dysfunction, infertility, hirsutism, acne, obesity, and metabolic syndrome. Polycystic ovary syndrome (PCOS) is a complex condition characterized by elevated androgen levels, menstrual irregularities, and/or small cysts on one or both ovaries. Polycystic ovary syndrome (PCOS) is one of the most common endocrine and metabolic disorders in premenopausal women [1, 2]. Heterogeneous by nature, PCOS is defined by a combination of signs and symptoms of androgen excess and ovarian dysfunction in the absence of other specific diagnoses. The etiology of this syndrome remains largely unknown, but mounting evidence suggests that PCOS might be a complex multigenic disorder with strong epigenetic and environmental influences, including diet and lifestyle factors. PCOS is frequently associated with abdominal adiposity, insulin resistance, obesity, metabolic disorders and cardiovascular risk factors [2, 3]. The exact pathophysiology of PCOS is complex and remains largely unclear. Genetic and environmental contributors to hormonal disturbances combine with other factors, including obesity, ovarian dysfunction and hypothalamic-pituitary abnormalities to contribute to the etiology of PCOS. However, a greater understanding of pathophysiological contributors in PCOS has been hampered by a lack of ideal methods to assess either hyperandrogenism or insulin resistance. Hyperandrogenism is a well-established contributor to PCOS etiology, detected in around

60% to 80% of cases. Insulin resistance is a pathophysiological contributor in around 50% to 80% of women with PCOS, especially in those with more severe PCOS diagnosed on National Institutes of Health (NIH) criteria and in women who are overweight [3, 4].

MATERIALS AND METHODS

We conducted an exclusive search using various electronic databases such as PUBMED, BMJ, LANCET, WHO Website, UNICEF website and Google Scholar for studies related to Polycystic Ovary Syndrome and various drugs showing promising results in the management of polycystic ovary syndrome.

Management of Polycystic ovary Syndrome

PCOS is a highly prevalent heterogeneous syndrome of clinical and/or biochemical androgen excess, ovulatory dysfunction and polycystic ovaries (PCO). Despite it being one of the most common reproductive health problems of women, its effective treatment remains a significant challenge to medical profession. Guidelines recommend exercise therapy and calorie-restricted diet as a crucial part of the management of obesity in women with PCOS [5, 6]. In fact, lifestyle modifications are considered as a cost-effective first line treatment and as a necessary adjunct to medication. Because the primary cause of PCOS is unknown, treatment is directed at the symptoms. Few treatment approaches improve all aspects of the syndrome, and the patient's desire for fertility may prevent her from seeking treatment despite the presence

of symptoms. Treatment goals should include correcting anovulation, inhibiting the action of androgens on target tissues, and reducing insulin resistance. Weight reduction for obese patients with PCOS is beneficial in many ways. Weight loss helps to decrease androgen, luteinizing hormone (LH), and insulin levels [6].

Drugs of herbal origin for PCOS

Insulin resistance, obesity and elevated levels of male hormones (androgens) are associated with PCOS. The deskbound lifestyle, dietary variations, lack of exercise and stress, etc. are also contributory factors. Many plants like *Asparagus Racemosus*, *Grifola frondosa*, *Lepidium meyenii*, *Tinospora Cordifolia*, etc., have been highly esteemed sources that have the advantages of reducing PCOS and also having hypoglycemic and anti-obesity effects [7, 8].

Asparagus Racemosus (Shatavari)

Asparagus racemosus, (Asparagaceae) is traditionally used in Indian medicine (Ayurveda). It helps in promoting the normal development of ovarian follicles, regulates the menstrual cycle and revitalizes the female reproductive system mainly due to its phytoestrogen (natural plant-based estrogen). It also helps in combating the hyperinsulinemia [9].

Tinospora Cordifolia (Guduchi)

Tinospora cordifolia, (Menispermaceae) is a well-known medicinal plant for its hypoglycemic effects. *Tinospora Cordifolia* is a powerful anti-inflammatory herb. Chronic inflammation in tissues is the root cause of insulin imbalance and

ovarian cysts. It helps in lowering insulin resistance, revitalizing all the body tissues and boosting metabolism naturally [10].

Foeniculum vulgare (Shatapushpa)

Foeniculum vulgare, (Apiaceae) seeds are used as a good supplement for the management of PCOS. They are a rich source of phytoestrogens. Phytoestrogens content in fennel helps in reducing insulin resistance and in bringing down the inflammation in PCOS. It is also believed that it helps in reducing the cellular imbalance which leads to metabolic disturbances in PCOS [10, 11].

Ocimum tenuiflorum (Holy Basil)

Ocimum tenuiflorum L. (Lamiaceae) is a traditional herbal medicine commonly known as Tulsi. *Ocimum tenuiflorum* is potentially effective for polycystic ovarian syndrome. It has excellent anti-androgenic properties to decrease androgen production (Hyperandrogenism) [11].

Actaea racemosa (Black Cohosh)

Actaea racemosa (Ranunculanae) is used in various disorders of the female reproductive system viz. anovulation, infertility, and hormonal balance which are important issues in PCOS. Black Cohosh can induce ovulation in women with polycystic ovarian syndrome (PCOS). *Actaea racemosa* was renowned as a women's remedy associated with childbearing and the menstrual cycles. It was effective in treating amenorrhea, leucorrhoea, dysmenorrhoea and other menstrual, and uterine conditions [11].

Lepidium meyenii (Maca)

Lepidium meyenii from the Brassicaceae family is a traditional herbal medicine used in relieving menopausal symptoms, stimulates the endocrine system and acts as a natural hormonal balancer without side effects. Estrogen and progesterone hormones in the body help in encouraging a healthy menstrual cycle. It is an adaptogen and an incredible fertility superfood. *Lepidium meyenii* restores the levels of testosterone in Males [12].

Grifola frondosa (Maitake Mushroom)

Grifola frondosa (Meripilaceae) is a perennial fungus widely used in hypoglycemic effect and May be beneficial in the management of Diabetes. *Grifola frondosa* extract can able to induce ovulation in women with polycystic ovarian syndrome (PCOS) in animal studies. The proposed mechanism of action of *Grifola frondosa* is the modulation of blood glucose levels and enhancement of insulin sensitivity [13].

Taraxacum officinale (Dandelion Root)

Taraxacum officinale (Asteraceae) is an effective bile flow stimulant and liver detoxifier. It is used to cleanse the liver and get rid of any build-up of hormones. This cleanup can stimulate the production of SHGB which reduces the free testosterone in the blood which is used in PCOS treatment because menstrual irregularities are often affected by the liver which is backed up with excessive hormones. It also helps in the removal of toxins from the body, thus helping women who are experiencing fertility problems and menstrual issues [14].

Pergularia daemia (Veli paruthi)

Pergularia daemia (Asclepiadaceae) is known as “Veliparuthi” in Tamil, “Uttaravaruni in Sanskrit. Traditionally *Pergularia daemia* is used for its various pharmacological activities. It has a potential effect on normalizing menstrual irregularities and regularizing the estrous cycle. So the restoration of the estrous cycle reduces the development of follicular cyst [15].

Galega officinalis (Goats Rue)

Galega officinalis (Fabaceae) requires more clinical studies to reveal its beneficial effect in women with polycystic ovarian syndrome. *Galega officinalis* has been known since the Middle Ages for relieving the symptoms of diabetes mellitus, it turned out into guanidine, a substance that decreases blood sugar by decreasing insulin resistance. However, it is the natural source of guanidine which is an anti-diabetic drug from the biguanides class. A commonly used drug for PCOS is Metformin which belongs to the biguanide class. This association alone should garner this herb as a second look for treating polycystic ovarian syndrome [16, 17].

Areca catechu (Betel Palm)

Areca catechu (Arecaceae) tenderly maintains the healthy production of female hormones & relieves congestion of the blood vessels in abdominal area. *Areca catechu* maintains healthy female reproductive system, eases menopausal transition and helps in supporting healthy libido. It helps in increasing the retentive power of the

uterus and is used to remove debility after childbirth [18].

Cinnamomum zeylanicum (Cinnamon)

Clinical trials on PCOS women showed a significant reduction in insulin resistance by increasing phosphatidylinositol 3-kinase activity in the insulin signaling pathway due to the presence of insulin potentiating factor which enhances the insulin activity in carbohydrate metabolism [19].

Glycyrrhiza glabra (Licorice)

Clinical studies conducted on licorice confirmed that it reduces serum testosterone probably due to the block of 17-hydroxysteroid dehydrogenase and 17-20 lyase in PCOS [20].

Nigella sativa Linn (Kalonji)

Kalonji oil was proven to be effective in patients with insulin resistance syndrome and in alleviating obesity mainly due to its insulin-sensitizing action. Various components of kalonji like thymoquinone, thymol, unsaturated fatty acids, lipase and tannins are responsible for its beneficial effects in insulin resistance syndrome [21].

CONCLUSION

Many studies across the world have confirmed that PCOS can be treated with herbal remedies and lifestyle management. Unani physicians have recommended regular induction of menstruation as one of the treatment modalities applied for women who have developed masculine features suggestive of PCOS. Management based on

correction of temperament, menstrual regulation by use of emmenagogue drugs and local application of herbs to reduce the severity of hair growth, acne, and hyperpigmentation due to PCOs have also been reported. Preclinical and clinical studies have provided preliminary evidence that herbal medicines may have beneficial effects for women with PCOS. In addition, alternate therapeutic protocols have been followed to improve the quality of life in these patients. However Further investigations into the mechanisms of effect for herbal extracts are needed to complete our understanding of the reproductive endocrinological effects of herbal medicine for this condition.

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