

## Chapter 6

# An Insight on Polycystic Ovary Syndrome (PCOS) and Use of Herbal Medicines as Alternative Treatment

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### ABSTRACT

*One of the most common endocrine disorder in females during reproductive age which leads to infertility, metabolic derangements, and also psychological impairments is polycystic ovary syndrome (PCOS). This syndrome has been known to increase the risk of type 2 diabetes, obesity, hypertension, cardiovascular diseases, lipid disorders, and also autoimmune thyroiditis. Impending complication list includes malignancies like breast and endometrial cancer. The actual cause of this syndrome is unknown, and perhaps, it could be due to a combination of various unmodifiable genetic factors and modifiable environmental factors. Several research studies have been carried out on management of PCOS, and many medicinal plants have been used as an alternative therapy for oligo/amenorrhoea, hyperandrogenism, and PCOS in women. The chapter gives an insight on PCOS, its management, and elucidates the effects of medicinal plants on PCOS.*

### INTRODUCTION

In the developed world, one of the debatable heterogeneous endocrine disorder, known to affect females in reproductive age, causing health complications namely infertility, menstrual dysfunction, obesity, acne and metabolic syndrome is Polycystic ovary syndrome (PCOS) (Dargham et al, 2017; Norman, 2007; Knochenhauer et al., 1998). About 12-24% have been known to be affected by PCOS leading to infertility (Nirav, 2017), characterized by imbalance of sex hormones (Khomami, 2015).

Infertility is known to affect three million couples in US and 17% of couples in industrialized countries are known to seek help for infertility. It is reported that 40% of cases are due to factors related to

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females, 30% due to male, 20% are usually combination of both male and female factors and 10% are due to unknown cause. The cause for infertility may be due to endometriosis, tubal damage, ovary failure or low sperm count (Siladitya, 2010; Marcelle 2005). The problems in ovulation in females has been related to cause of infertility in PCOS women. Apart from PCOS, fertility is also affected by some of the other hormonal conditions like premature ovarian failure, diabetes, thyroid problems, and sometimes Cushing's syndrome. (Marcelle 2005).

The reproductive system is an integral part of the endocrine system, and this syndrome is characterized by endocrine, metabolic and genetic disorder (Zahra et al, 2018). The organs involved in PCOS are ovary, adrenal gland, pancreas and the pituitary gland (Shantaram, 2019). It is a condition with epigenetic origins influenced by uterine environment and also behavioral factors (Norman et al., 2007). Dietary pattern along with physical activity, stress and smoking are some of the environmental factors that have an important role to play in the manifestation of the syndrome (Xita & Tsatsoulis, 2006; Nardo et al, 2008; Abbott et al., 2002). The management depends on symptoms like ovulatory dysfunction, androgen-related symptoms or menstrual disorders (Ahmed & Abubaker, 2011). Traditional medicinal plants have found its use since thousands of years in the treatment of various ailments and research findings on herbal medicine and its effectiveness on PCOS treatment is available for some of the herbs.

The present chapter deals with PCOS prevalence, etiology, clinical manifestations, associated comorbidities, conventional treatment and management along with its drawbacks, and an insight on alternative therapy for PCOS management with special reference to the beneficial effects of medicinal or herbal plants used in Ayurvedic practice in India, Tradition Arabic /Persian medicine, Traditional Chinese Medicine as well as Korean herbal medicine practice. Concerns related to herbal medicine supplements and strategies for safe use has also been dealt with in the chapter.

## **BACKGROUND**

PCOS, also known as 'Stein-Leventhal Syndrome', is a persistent global health problem known to have an impact on multiple organ systems that exerts reproductive and metabolic manifestations (Nirav, 2017; Tracy et al., 2016). This complex (Tracy et al., 2016; March et al., 2010; El-Sharkawy et al., 2014; Richard et al., 2013; Robert & David, 2016) trait results from the interaction of genetic and also environmental factors that manifests usually at puberty (Robert & David, 2016). The clinical characteristics and features of this syndrome first described in 1935 by Irving Stein and Michael Leventhal, develops when the ovaries are stimulated to produce excess androgens, particularly testosterone (Stein & Leventhal, 1935, Strauss, 2003). The resultant increase in male hormone leads to polycystic ovaries (Strauss, 2003).

Diagnostic criteria for PCOS have been set by National Institutes of Health (NIH) 1990, Rotterdam 2003, AE-PCOS Society 2006, NIH 2012/International PCOS Guidelines 2018. To determine the presence or absence of PCOS, each of these suggests criteria that have slightly different biological, clinical and image-based findings (Okoroh, 2012). An international evidence-based guideline for the assessment and management of PCOS released in 2018 recommends the use of the Rotterdam diagnostic criteria (Teede et al., 2018). Rotterdam criteria is accepted criteria in Asia, Australia and Europe (Stepito et al., 2013; Yildiz et al., 2012.). This criteria described presence of polycystic ovaries and hyperandrogenism in females with normal menstrual cycles, and also women with polycystic ovaries and ovulatory disturbance without hyperandrogenism (Broekmans et al., 2006). The diagnosis necessitates the presence

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