

Polycystic ovarian syndrome (pcos) causes and symptoms



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Polycystic Ovarian Syndrome in the Reproductive Woman: An Epidemiological Approach

Abstract

One of the most prevalent disorders among women with reproductive age is polycystic ovarian syndrome (PCOS). Though the etiology of this syndrome is unknown, it can be diagnosed on the basis of three cardinal characteristics. This paper defines the issue along with a brief background and its significance. It also explores the prevalence and incidence rate worldwide and especially in Pakistan. Moreover, it will enlighten the major risk factors and long term concerns which have made life of women miserable. A review of treatment which includes pharmacological and non-pharmacological ways that is diet and exercises will be highlighted. Furthermore, it provides recommendation at individual, community, institutional, national and government level. It also explores the need of future researches among women with PCOS. By approaching all these aspects, women can combat with PCOS and reduce forthcoming morbidities.

Women of all ages experience multiple health issues. Particularly, women during her reproductive years encounter gynecological and endocrine disorders that exasperate their lives. Among all disorders, polycystic ovarian syndrome (PCOS) is the most common endocrinopathy. PCOS was referred as Stein-Leventhal Syndrome after Irving Stein and Micheal Leventhal, who first described it in 1935 (KINZA). However, record of PCOS dates back from atavistic era. Hippocrates, Soranus of Ephesus and Moises Maimonides identified women with oligomenorrhea, sterile conditions, masculine and

healthy appearance which suggests PCOS (Azziz, Dumessic, & Goodarzi, 2011). According to National Institute of Health Conference (1990), " Women are defined to have PCOS if they have chronic anovulation and evidence of androgen excess for which there is no other cause" (Guzick, 2004, p. 181).

The diagnostic criteria's for PCOS are convened by the National Institute of Health in 1992, the European Society for Human Reproduction and Embryology/American Society for Reproductive Medicine i. e. Rotterdam criterion in 2004 and the Androgen Excess and PCOS Society in 2006.

However, a Rotterdam criterion is widely used. According to Rotterdam criterion, presence of any two cardinal features is sufficient to diagnose a woman with PCOS. These features include oligomenorrhea or anovulation, clinical or biochemical hyperandrogenism and polycystic ovaries. This criterion also defines the morphology of polycystic ovaries i. e. " the presence of 12 or more follicles measuring between 2 and 9 mm in diameter and/or an increased ovarian volume of greater than 10 cm³" (Sirmans & Pate, 2014, p. 3).

PCOS has a high prevalence and incidences not only in western areas, but also in Eastern areas, specifically in Asia. Rehman, Salahuddin and Obaid-ur-Rehman (2005) estimated 20% women from the general population, and 10% women of reproductive age suffer from PCOS. A study conducted in UK reported that 20% - 25% white women suffer from PCOS whereas the ratio was found to be much higher in South Asian women i. e. 52% (" Karachi: Seminar told ovarian disease," 2010). A prospective study conducted in Greece, Spain and United States concluded that about 4% - 8% of women were diagnosed with PCOS (Teed, Deeks & Moran, 2010). In India, a cross-
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sectional study revealed that 51 out of 96 women have PCOS (Bhattacharya & Jha, 2011). Furthermore, 20.7% women of reproductive age group are affected in Pakistan (Baqai, Khanam, & Parveen, 2010). The morbidity rate of PCOS is expanding to a great momentum due to lack of awareness regarding preventive measures and inappropriate healthcare facilities. Its long term consequences do not limit to the reproductive axis; women with PCOS are at high risk for acquiring metabolic and cardiovascular illnesses (Avery & Mayer, 2007). In spite of its deleterious impacts PCOS has persisted for many years. It also remains a challenge for the clinician's to diagnose and manage it. However, better understanding of the complexities of PCOS will ultimately lead to improved health outcomes and effective clinical care. This compelled us to converse over the epidemiology of PCOS. "PCOS has been identified as an area of clinical need and as a public health issue" (Hailes, 2011, p. 28).

The exact etiology of PCOS is yet unknown, but several sufficient determinants are associated with its occurrence (Rehman et al., 2005). Insulin resistance is the major underlying factor. About 50-80% of the women with insulin resistance reported to have PCOS. Insulin plays both direct and indirect roles in the appearance of the disease. High levels of insulin work synergistically to the luteinizing hormone. Together they increase the androgen production of theca cells which lead to lipid abnormalities (Zacur, 2003). Moreover, elevated insulin level inhibits hepatic synthesis of sex hormone-binding globulin leading to increase amount of unbound or free testosterone (Ehrmann, 2005). Ahmed et al. (2008) highlighted genetics as an important risk factor for PCOS. Deregulation of the cytochrome P450c17 gene affects ovarian function which results in hyperandrogenism (Ahmed et

al., 2008). Ehrmann (2005) reported that an abnormality in the hypothalamic-pituitary-ovarian axis (HPOA) is associated with PCOS. Rojas et al. (2014) concluded that an increase impulse frequency of HPOA raises the production of luteinizing hormone (LH). This in turn increases the synthesis of androgens, suggestive of PCOS (Ehrmann, 2005). Other factors include altered steroid metabolism that is dysregulation of 11 β -hydroxy steroid dehydrogenase (Ahmed et al. 2008). In a retrospective study, women on antiepileptic drugs reported menstrual irregularities. Hence a positive relation between antiepileptic drugs and PCOS was found (Zacur, H., 2005; American Pregnancy Association, 2014). Vitamin D deficiency may place a woman to develop PCOS (Thys-Jacobs, Donovan, Papadopoulos, Sarrel, & Bilezikian, 1999). Serum 25-hydroxyvitamin D (25OHD) decreases if women have higher body mass index (BMI), fat and insulin resistance. Hence, vitamin D deficiency alters intracellular calcium, which results in ovarian dysfunction (Khan et al., 2014).

Untreated PCOS have various ramifications, including reproductive, metabolic, cardiovascular and psychological alterations. According to Legro et al. (2013), endometrial hyperplasia and endometrial cancer may occur due to deficiency of progesterone. Moreover, women with PCOS are prone to develop Diabetes Mellitus (DM) type II in later life. A case control study revealed that 7.5% of women end up with DM type II (Legro, Kunesman, Dodson, & Dunaif, 1999). In addition, PCOS can affect circulatory system in an indirect way as women develop dyslipidemia and cardiovascular diseases. Anxiety and depression are the most common psychological issues reported by women with PCOS (Way, 2013).

Lifestyle modification should be adopted by women suffering from PCOS. These amendments include weight control, stress management and dietary modification. A small amount of weight loss as little as 5% can help a woman to regulate the menstrual cycle and ovulation. Weight control can be beneficial for a woman to sustain mental well-being, and enables her to partially culminate the risk of cardiac and metabolic disorders (Boyle & Teede, 2012). Moreover, dietary management includes the consumption of low glycemic index, high fiber and low fat diet to reduce the associated symptoms of PCOS.

No ideal pharmacological treatment has yet been found that completely treats PCOS. However, symptomatic treatment is usually preferred. Low dose of oral contraceptive pill, cyclic progestin and metformin are used as first line treatment for PCOS. These drugs help in treating ovarian dysfunction, menstrual irregularities and hyperandrogenism (Garad, Teede, & Moran, 2011). Elter and colleagues concluded from their clinical trial that OCP in combination with metformin is more effective in suppressing the androgen level as compared to OCP alone (Ahmed, Qureshi, Anjum, Akhtar, & Anhalt, 2008). In presence of hirsutism spironolactone (200mg/d) is commonly prescribed (Guzick, 2004). Clomiphene citrate is recommended to induce fertility in women with PCOS. It triggers FSH secretion and mature ovarian follicle. Herbal therapies are also used to cure PCOS which includes liquorice, kasip fatimah, spearmint tea, etc. All three herbs have anti-androgenic properties. In Turkey, RCT concluded that women who receive spearmint tea have decreased levels of free testosterone (Goswami, Khale, & Ogale, 2012).

Recommendation and future research

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PCOS is endemic in Pakistan, particularly in the reproductive women. To reduce the incidence rate following recommendation can be helpful. At an individual level, it is significant to provide psychological support to the women suffering from PCOS. This will enhance her self-confidence and enable her to cope effectively. Moreover, counseling services should be readily available for newly diagnosed women. These services should emphasize on weight management via diet and exercise. Proper instructions regarding drug dosage, side effects and the importance of compliance is crucial. The physical changes in the women with PCOS not only impact her well-being, but her family is equally affected. Therefore, family concerns should be addressed. Further, regular follow up should be stressed.

It is estimated that 70% of women with PCOS remain undiagnosed in the community due to lack of awareness (March et al., 2010). Therefore, several screening programs should be organized to assess women's physical, metabolic, and reproductive health. These programs help women to identify any alterations in their bodily functions. Further, it helps health care workers to plan effective need based interventions for them. Community health centers should arrange weekly monitoring of blood pressure, weight and BMI. Health institutions should initiate yearly screening programs for lipid profile, glucose levels (Boyle et al., 2012) and Vitamin D levels.

Various mediums can be used to increase awareness in the population. Women should be educated to self-monitor the symptoms of PCOS. This could be achieved through the distribution of pamphlets, brochures, and flyers at institutional level. Similarly, at national level mass media like television shows and commercials, plays an important role.

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Awareness is an essential tool to save future daughters, wives and mothers from PCOS. Government in affiliation with health and education sectors should make policies to initiate awareness among school going girls, regarding menstrual irregularities and warning signs of PCOS. Also, the government should introduce free health services in district and tehsil hospitals to maintain sexual health of women (Beydoun et al., 2009). In collaboration with non-governmental organizations awareness sessions and support groups should be planned for high risk and previously diagnosed women to prevent them from complications. More parks and walking tracks should be made, and specific hours should be allocated for women.

PCOS remains a debating issue for researchers as its causes and outcomes are emerging day by day. Matzke (2011) suggested that large sample studies in non-randomized clinical trials should be conducted. This would increase validity, reliability and applicability of the researches. Longitudinal studies should be conducted, and an individual should be followed for more than 5 years exactly after the diagnosis. The purpose of long term monitoring is to evaluate the significant changes that occur due to PCOS (Matzke, 2011). There is a need to modify the name of PCOS as this term only focuses on cyst and ovaries. Therefore, a name that defines its intricacy and reflects its characteristics in metabolic, hypothalamus, pituitary, ovarian, and adrenal interactions should be suggested (National Institute of Health, 2012). A few studies indicate that fertility drug such as clomiphene citrate may increase the risk of ovarian cyst if taken for a long period (American Pregnancy Association, 2014). In this regard, further experimental researches should be performed to evaluate the evidence of PCOS in such

women. A Chinese medicine cryptotanshinone is known for its significant effect in endocrine and metabolic disorders. However, this medicine is only tested on rats and showed a significant decrease in the symptoms of PCOS (Yu et al., 2014). Therefore, clinical trials of this drug are suggested.

Ayurveda is a traditionally used treatment regimen. An experimental uncontrolled study was done to investigate the effectiveness of samprapti kriya and other herbs for curing sub-fertility in PCOS. Results showed that 85% of the women get cured and 75% were able to conceive (Siriwardene, Karunathilaka, Kodituwakku, & Karunarathne, 2010). About 70% of Pakistani people prefer alternative therapies over conventional medicines (Kokab & Ahmad, 2011). Therefore, further research is required to validate the effectiveness of ayurveda treatment.

In conclusion, PCOS have emerged as a devastating endocrine disorder among women worldwide. The chief cause is unknown yet. This syndrome displays a variety of reproductive, metabolic, cardiovascular and psychological features. Management primarily focuses on lifestyle modification along with certain pharmacological medications for presenting symptoms. To eradicate this disorder, efforts are required at individual, community, institution and governmental level. Working on future research needs would help us to achieve better outcomes in upcoming years.