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A REVIEW ON POLYCYSTIC OVARIAN SYNDROME: IT'S ASSOCIATION WITH REPRODUCTIVE AND METABOLIC MANIFESTATIONS

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ABSTRACT:

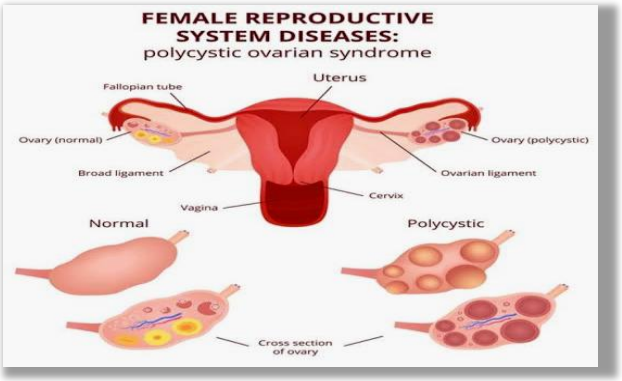
Polycystic ovarian syndrome (PCOS) is an endocrine disorder affecting many women of childbearing age. PCOS is a multifaceted lifestyle disorder characterized by various clinical manifestations like menstrual irregularity, reproductive infertility, hyperandrogenism, hirsutism, metabolic insulin resistance, diabetes mellitus and also various psychological features. But yet, the exact etiology of the disorder is not known till date. Literature was searched from Google scholar and PubMed. It affects 8% to 13% of reproductive women and is associated with reproductive and metabolic dysfunction. And the prevalence range mainly depends the methods applied and the studies based on Rotterdam criteria shows higher prevalence rate than any other methods. Genetic and environment contributes to the pathophysiology of the disease. Obesity worsens the presentation of PCOS and weight management and is proposed to be an initial strategy along with lifestyle modifications, dietary intake habit and physical exercises. Lifestyle modifications aimed at normalizing insulin resistance, improving androgen status and aiding weight management is recognized as a crucial initial treatment strategy. Monitoring and management of long term metabolic complications is also an important part of routine clinical care. Further research is required in this complex condition, emphasizing on lifestyle management as more and more cases has been rising in India till date.

KEYWORDS:

POLYCYSTIC OVARIAN SYNDROME, INSULIN RESISTANCE, INFERTILITY, MENSTRUAL IRREGULARITY, LIFESTYLE, DEPRESSION, ANXIETY.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a multifaceted lifestyle disorder. It is the most well – known endocrine condition among women of this generation worldwide affecting 6% – 12% of women of reproductive age and mostly starts among females of adolescent stage. 1, 2, 3 The endocrine system regulates and secretes hormones throughout the body. PCOS is often associated with hormone irregularities. However, the exact etiology for the cause of PCOS is unknown. Irregularity in menstruation, excess of body and facial hair growth, loss of hair in the scalp, heavy weight gain occurs among the women with PCOS. Throughout the world, prevalence of PCOS among general population is 5% – 10% in the women of reproductive age and about 40% women with PCOS experience depression and anxiety, most particularly it prevails among the young girls. 3 Two studies assessed the prevalence of anxiety and depressive disorders among women with PCOS and had found a prevalence of 28% and 39% for anxiety and 11% and 25% for depression. 4, 5 Particularly, women with PCOS have been found to be at an increased risk of social phobia and suicide attempts. 6 The high prevalence of anxiety and depression in PCOS women is however found to be very complex. 7 Some studies suggested the cause of psychological distress like anxiety and depression is due to the physical symptoms experienced by women having PCOS. 7 Anxiety disorders and depression significantly impacted the global burden of the disease. A study determined psychological distress in women with PCOS is significantly related to obesity, infertility, acne and hirsutism. 8 Women with PCOS have (3-8) time's higher prevalence of anxiety disorders than control groups. 9 There are multiple factors that are likely to contribute to the higher prevalence of anxiety disorders in women having PCOS. As a whole, in this article anxiety disorders among the women with PCOS is discussed and with probable management of the stress among the women.



MATERIALS AND METHODS

Prevalence of PCOS is assessed through peer-reviewed articles with diagnosis of anxiety and depressive disorder. Literature search was performed on Google scholar and a comprehensive search of PubMed is done. The most searched terms are polycystic ovarian syndrome, depression and anxiety disorders.

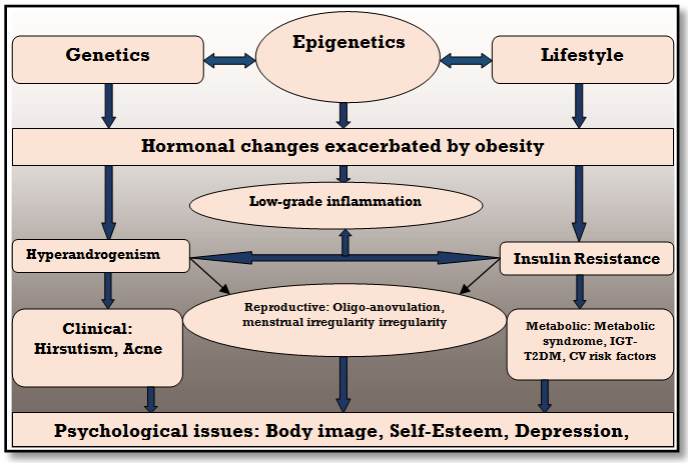
RESULTS

PREVALENCE OF THE DISEASE

Several studies reported PCOS prevalence ranging between 8% - 13%, depending on the population being studied within their reproductive age and anxiety disorders to be ranging from 34% - 57%. [6, 10, 11, 12] In few Asian countries prevalence figures are ranging from 2% to 7.5% in China and 6.3% in Sri Lanka. In South India and Maharashtra, prevalence of PCOS according to Rotterdam criteria was reported as 9.13% and 22.5% (10.7% by Androgen Excess Society criteria) respectively. [14] An estimated one in five (20%) Indian women suffer from PCOS. The prevalence rate differs with the different criteria used and as Rotterdam criteria is the most acceptable, therefore, studies adopting Rotterdam criteria reported higher prevalence rates when compared with other methods. [15] Media accounts suggested that PCOS is on the rise in India and most prevalent among the urban middle and upper classes because of their lifestyles. [16, 17, 18]

PATHOGENESIS

Both genetic and environment factors environment factors contribute to pathophysiology of PCOS. [19] The condition is markedly featured by the abundance of androgen activity. The key hormone contributing to pathophysiology of PCOS is evidenced by hyperandrogenism which can be marked by the raised levels of free testosterone. [20] In 1980's the administration of testosterone to female-to-male transsexuals was found to cause polycystic ovaries and ultrasonographic criteria was for the identification of polycystic ovarian morphology was developed. [21, 22] Meanwhile, significant insulin resistance was recognized to be related to hyperandrogenism and acanthosis nigricans and to occur independently of obesity in the syndrome. [23, 24, 25] Obesity, especially abdominal fat disposition, is the major predisposing factor for the expression of insulin resistance and metabolic phenotype in PCOS. [26] Leptin is a major intermediary between nutritional status and reproductive health of women. High levels of leptin have been found to be associated with the markers of IR in PCOS patients. [27, 28] PCOS has also long been suspected to have a component of autoimmune origin. [29] A study from New Delhi found higher prevalence of antithyroglobulin antibodies in PCOS women and suggested a possible role of autoimmunity in the pathogenesis of PCOS. [30]



CLINICAL FEATURES AND CO-MORBIDITIES OF PCOS

A study reported that phenotype with hyperandrogenism and regular menstrual cycles had higher insulin resistance and gonadotropic hormonal abnormalities. [31] Another study demonstrated that hyperandrogenism, in the form of high testosterone values, correlated well with obesity and sleep-disordered breathing in PCOS women, and this might be one of the reasons for high cardiovascular morbidity in the PCOS patients. [32] PCOS is found to occur in both obese and non-obese women, although markers of insulin resistance are more common in obese women. [33] A study has been reported that Acanthosis nigricans (AN) was found to be present in more than half of the PCOS women in Manipal, India. [34] The prevalence of abnormal glucose tolerance (AGT) detected by oral glucose tolerance test (OGTT) was found to be high (around 35%) in a large number of young Indian women with PCOS, and it was found that family history of diabetes was not a predictor of abnormal glucose tolerance test (AGT) in these women. [29] Therefore, many studies demonstrated the relationship between the well-known manifestation of hyperandrogenism among Indian PCOS women and metabolic morbidities including insulin resistance, glucose intolerance and cardiovascular risk in the population. [29]

PSYCHOLOGICAL FACTORS OF PCOS

The relationship between PCOS and psychosocial problems has come to the attention of the medical community very recently. [35, 36] And several reports have linked specific features of PCOS, such as infertility, hirsutism and acne to decreased the mental well-being. [37, 38, 39] Researchers suggested that women with PCOS tended to have elevated scores of anxiety and depression compared to non-PCOS women. [40] [41] described the pathways of testosterone leading to psychological distress, including direct and indirect effects through the unwelcome manifestations of PCOS. A study has also reported that women with PCOS tend to be more emotionally labile than women who do not suffer from PCOS, and they are most likely to express feelings of anger. [41] Mood disorders among PCOS sufferers may enhance their disease burden, as those suffering from depression

and anxiety may also present with significantly higher dehyroepiandrosterone sulfate (DHEAS) levels. [43] Depression is the most often studied syndrome in relation with PCOS and several studies have shown that women with PCOS are times higher. Anxiety disorders, especially social phobia and generalized anxiety disorders also had a higher prevalence in PCOS populations. [44] Psychosocial effects of PCOS can also be estimated via the concept of life satisfaction as well. [45] According to many relevant studies, changes in the appearance of the patients, especially overweight, skin problems and hair growth on the face, all influences their life satisfaction. [46] Based on above summary, it can be concluded that women with PCOS are exposed to various psychological problems that can be rather serious.

MANAGEMENT OF PCOS

The choice of treatment of PCOS depends on the symptoms with which a patient presents. And it is complex as the condition itself. The management of PCOS includes a healthy diet, regular physical activity and medications, which addresses the associated manifestations and co-morbidities. [29] It mainly include managing menstrual regularities, controlling of hyperandrogenism (acne and hirsutism), management of infertility and insulin resistance along with its associated risk factors (type 2 diabetes mellitus, hyperlipidaemia and obesity). [29] There are two kinds of management strategies for treatment of PCOS – non-pharmacological and pharmacological strategies which is important for overall management of PCOS.

Over half of all PCOS sufferers are overweight or obese, so PCOS patients are primarily recommended to reduce weight since a good, balanced diet combined with regular exercise can raise their metabolism, improve insulin sensitivity, and help those lose weight safely. [47, 48] PCOS women most commonly suffers from hormonal imbalances, high blood cholesterol levels, and are obese. Therefore, working out alone will never be enough for treating PCOS. It is also important to have a balanced healthy diet. [49] According to research, reducing up to 5% of one's initial weight can help restore regular menstruation and boost the reaction to ovulation and reproductive medications. [48] A study on reproductive-age women with PCOS, improvement in novel inflammatory cardiac risk factors such as hs-CRP was reported with lifestyle modification, although metformin was given to the study participants. [50] Use of metformin in PCOS women with luteal-phase progesterone deficiency and reported improvement in the same after four weeks of treatment with metformin 500 mg thrice a day. [51]

Education on short-term and long-term sequelae of PCOS from a reliable independent source is important in allaying anxiety and minimizing the impact of illness in chronic disease. [52] As a prelude to treatment psychological features need to be acknowledged, discussed and counseling considered, to enable lifestyle change which is unlikely to be successful without first addressing education and psychological issues. [52] Lifestyle changes are the first line treatment in an evidence-based approach in the management of the majority of PCOS women who are overweight. [53] Evidence shows that lifestyle change with small achievable goals results in clinical benefits even when women remain in the overweight or obese range. [54, 55, 56] Standard dietary management of obesity and related comorbidities is a nutritionally adequate, low fat and high carbohydrate intake, with increase fiber-rich whole gram breads, cereals, fruits and vegetables and moderate regular exercise. [57] Incorporating simple moderate physical activity including structured exercises and incidental exercises increases the outcomes in PCOS, compared to diet alone. [58] Exercise alone also improves clinical outcomes. As in general population, goals for exercise must focus on overall health benefits not weight loss per se.

Currently, there is no cure of PCOS. Oral contraceptive pills (OCP) does improve hyperandrogenism and insulin sensitizers (primarily metformin) reduce insulin resistance in PCOS. [59] Generally, medical therapy is targeted to symptoms and should not be used as an alternative to lifestyle therapy in PCOS. [10] OCP has long been used in PCOS to induce regular cycles, protect the endometrium and treat hyperandrogenism. It also reduces ovarian androgen production. [52] Metformin has had also important significant role in the management of PCOS improved to manage ovulation, menstrual cycles and potentially hirsutism. [52, 60] Based on International Diabetes Federation recommendations, metformin has a role in prevention of diabetes where lifestyle therapy is inadequate. [59, 61] A study reported that neither metformin nor OCP are approved by most regulatory authorities specifically for PCOS. OCP is for contraception and metformin is used for the treatment of diabetes. [10]

SUMMARY AND CONCLUSION

PCOS is a common complex condition in women associated with psychological, reproductive and metabolic features. It is a chronically multifaceted disorder with various clinical manifestations which affected the quality of life and represents an economic and psychological burden. Hyperandrogenism and insulin resistance contribute to pathophysiology of PCOS. The classic reproductive and dermatological features of PCOS are just the visible part of this complex disorder. The inflammatory and metabolic derangements associated with PCOS are explained in part by the coexistence of insulin resistance and obesity but are fuelled by the androgen excess. Insulin resistance occurs mostly among the overweight women with PCOS and these women have a high risk of various metabolic syndrome. Medically PCOS cannot be cured till today. Therefore, PCOS can be managed by focusing on awareness, support, strongly stressing on a healthy lifestyle and proper dietary intake. Small achievable goals of 5% loss of body weight result in significant clinical improvement even if women remain clinically in the unhealthy overweight or obese range. Further research is required in this complex condition, emphasizing on lifestyle management as more and more cases has been rising in India till date.

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