

**COMPARATIVE STUDY OF PATHOGENESIS OF PCOS AND ITS CORRELATION
CITED IN VARIOUS AYURVEDIC AND MODERN RESEARCH PAPERS PUBLISHED**Swati S Mohite¹, Sonali Sanjay Chaudhari²,¹HOD and Professor Prasutitantra Evam Streeroga Department, College of Ayurved, Bharati Vidyapeeth Deemed (to be) University, Pune, Maharashtra, India²PG Scholar Prasutitantra Evam Streeroga Department, College of Ayurved, Bharati Vidyapeeth Deemed (to be) University, Pune, Maharashtra, IndiaCorresponding Author: sonalic164@gmail.com<https://doi.org/10.46607/iamj2108122020>

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**ABSTRACT**

PCOS is the most common endocrine condition in reproductive-aged women. The word “Syndrome” is used to describe PCOD because, it is a complex manifestation involving many factors and organs. It is characterized by reproductive, endocrine, metabolic and physiological features. The presence of polycystic ovaries is an important diagnostic criterion for PCOS. This syndrome can also be associated with metabolic issues including obesity, insulin resistance, hyperinsulinemia. Recently, there has been an increase in interest in the field of PCOS research. It is categorized as a chronic disease with treatments that only address symptoms, the condition is terrifying to most because of its painful and uncomfortable side effects, adverse impact on fertility, and high risk of complications. PCOS in *Ayurveda* is correlated with *Artavakshaya*. It needs early diagnosis and long-term management for avoiding long term complications. This article aims to provide a balanced review of the latest advances and current limitations in our knowledge about PCOS while also providing a few clear and simple principles, based on current evidence-based clinical guidelines, for the proper study of pathogenesis of PCOS, also by looking at the findings of modern medicine we are correlate here the exhibiting features of the disease with the dominate *Dosha* responsible for the disorder.

Keywords: Polycystic Ovary Syndrome, Pathogenesis, PCOS

INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a common and complex endocrine disorder.¹ In this study various research papers are studied and comparison of is done. Comparative research is the act of comparing two or more things with a view to discovering something about one or all of the things being compared. As pathogenesis of PCOS is not fully elucidated,² so its comparison is the main aim of this study. Pathogenesis is defined as the origination and production of the disease. Pathology is the study of the cause and effects of disease. It is an area which includes a number of distinct but inter-related medical specialties that diagnose disease. It may also refer to the predicted or actual progression of particular diseases. In general pathology addresses four components of disease: cause, mechanism of development (pathogenesis), structural alterations of cells (morphologic changes), and the consequences of changes (clinical manifestations). In this study pathogenesis i.e. factors which are responsible for the development of disease will be compared by viewing, the various *Ayurvedic* and Modern science research papers and studies. PCOS is an important example of a metabolic disorders.³ Modern science Diagnosis is currently based on a combination of the endocrine, metabolic and psychological features. The common pathological factors said by the researchers are Sedentary lifestyle, Hyperandrogenism, Insulin resistance and fat distribution, Folliculogenesis dysfunction, Neuroendocrine axis, Obesity, Genetic heritability and Environmental factors, etc. Somewhere found higher correlation for PCOS in monozygotic compared to dizygotic twins. This concluded high inheritance rates and heterogenous phenotype.⁴ Progesterone may also act to enhance upper airway dilator muscle activity and reduce airway resistance. Because women with PCOS having oligo- or anovulatory, they have low circulating progesterone concentrations which may contribute to the high prevalence of OSA in this disorder.⁵ *Ayurveda* deals with the cause *Hetu*, the manifestation or symptoms *Linga* and the therapy *Ausadha* of the two conditions a man's health *Swastha* or disease *Atura*.⁶ Departure from normal condition to an abnormal state of the function of

the body give rise to disease this is called as *Vaisamya* or disorder. In the body the *Doshas*, *Dhatus* and *Malas* are distributed and the disturbance in them leads to the disorder. Not only in their quantity but also in their quality i.e. properties and functions. In *Ayurveda* the evaluation of disease is the knowledge of *Vaisamya*. *Samprapti* is defined as the process of disease formation i.e. it tells how a disease is formed including the entire process right from the exposure to causative factors to the initial disturbances produced by those causative factors in the physical body and mind to the production of premonitory symptoms and symptoms of the disease.⁷ The term *Samprapti* from *Ayurvedic* literature can be correlated with the term pathogenesis. To understand the process of *Vaisamya*, a principle of the response of three factors i.e. *Nidana*-causative factors, *Dosas* and *Dusyās*. According to these principles *Dosas* get first vitiated by the causative factors then they vitiate the tissues of the body which are called *Dusyās* in *Ayurveda*. The development of disease is generally a prolonged process made of six stages are as follows: *Sancaya*, *Prakopa*, *Prasara*, *Sthana Samsraya*, *Vyakti* and *Bheda* together called as *Shatkriyakala* (disease process). It entirely means the accumulation, circulating to all over the body; setting down on the specific spot and produce well defined characteristics of a disease.⁸ Disease begins with the accumulation of one or more *Doshas*. When the three *Doshas* are in balance, the person enjoys good health. However, through imbalance diet, lifestyle, and exposure to stress and environmental factors, one or more of the *Doshas* can begin to become imbalanced. In this the *Dosha* increases in quantity and accumulates in its natural seat (*Sancaya*) i.e. Accumulation. After this qualitative change in the *Doshas* occurs, the *Doshas* acquires the tendency to spread beyond its normal place (*Prakopa*) Aggravation. The *Dosha* moves out of its place and circulates in the body. There are no specific symptoms during this stage (*Prasara*) i.e. Dissemination. The *Dosha* localizes in a tissue outside of its seat and begins to disrupt the function of that tissue (*Dhatu*) called (*Sthana Samsraya*) i.e. Localization. In this stage the

disease manifest clearly. The functioning of the tissues is disrupted by the imbalanced *Dosha (Vyakti)* called Manifestation. In this stage the disease become so embedded in the tissues that the body is not able to reverse it. Then the disruption of functioning becomes a long-term (*Bheda*) – Chronicity. In the first two of the six stages, there are no symptoms. In the third stage there may be vague, no-specific symptoms which become more pronounced in the fourth stage. Only in the fifth stage do symptoms manifest that are specific to a particular disease. Exposure to the etiological factors will disturb the equilibrium of the *Doshas* and cause their vitiation. The concept of ‘*Agni*’ in *Ayurveda* is a unique way to the understanding of the physiology of digestion and metabolism. The *Agni* is derived from the ‘*Tejas*’ *Tatva* of *Panchamahabhuta* which is closely related to the *Pitta Dosha*.⁹ When the *Agni* becomes weak (*Mandagni*), a number of unwanted byproducts of digestion and metabolism start accumulating in the body such products are collectively called *Ama* and act as toxic materials. This causes the accumulation of *Doshas* and is the first *Kriyakala* in the sequence of development of disease.¹⁰ *Ama* has the properties such as *Guru* (heavy), *Snigdha* (unctuous), *Picchila* (sticky), *Avipaka* (undigested). *Atiguru Ahara* qualitatively while *Atimatrashana* and *Adhyashana* quantitatively becomes load over *Agni*, hence are responsible for *Ama*. *Divasvapa* leads to the *Kapha-Pitta Vriddhi* due to which the consumed food doesn’t digest properly and causes the *Ama* production. *Chinta* is mentioned as causative factor for the production of *Ama*. A person having stress doesn’t follow the proper diet and it leads to the indigestion and production of *Ama*.¹¹ The above conditions by which *Ama* is produce theses are causative factors for the development PCOS too. Thus, *Mandagni*, *Amavastha* are precipitating events for the *Sanchaya of Doshas*, which is the first stage of disease according to *Ayurveda*. The study includes the correlation of modern pathological factors with the factors explained in *Ayurveda* for the development of PCOS. The purpose of this article is to present a review of the literature by searching the databases Pub med, focusing on publications related to polycystic ovaries, including its pathogenesis.

NEED FOR STUDY

Occurrence of PCOS in various stages of life of women i.e. in Adolescent, Fertile and Menopausal stage. PCOS is very common, but it remains undiagnosed and unmanaged in most people who have it. PCOS is underdiagnosed and undertreated. This may be because symptoms can be mild or seem unrelated. But untreated PCOS can lead to a wide range of more serious health conditions, and the symptoms of the disorder can cause significant distress. Unmanaged PCOS is associated with type 2 diabetes, infertility, cardiovascular disease, obesity, sleep apnea, and depression. The cause of PCOS is unknown, thus there is no cure and its management remain suboptimal. We review here the strong support for develop a pathogenesis of PCOS said by the various research papers. The various metabolic, endocrine and psychological features in relation to the pathogenesis of PCOS highlight the multifaceted nature of the disorder and the need for the further research into the subject to better mark the contribution of each of these features in the development of PCOS. The need for the study of the pathogenesis of PCOS is to overcome the above said conditions and to maintain the health of the women; by referring various research papers this an effort to compare and correlate the pathogenesis of PCOS.

Aim and Objectives

AIM- Comparative study of pathogenesis of PCOS and its correlation cited in various *Ayurvedic* and Modern Research papers published.

OBJECTIVES-

1. To refer and study of *Ayurvedic* and modern papers of pathogenesis of PCOS.
2. To study the general pathogenesis and specific pathogenesis in development of PCOS.
3. Compare and correlate the pathogenesis of PCOS said by *Ayurvedic* and modern research Papers.

Literature Review

Ayurvedic perspective describes a PCOS to have an equal involvement of the *Dosha*, *Dhatu* and *Upadhatu*. It does not correlate the condition to a single disease or syndrome but the symptoms bears a resemblance to the terminologies defined as *Anartava* – Amenorrhoea, *Yonivyapada* - anatomical and physiological disorder

of the reproductive system like *Arjaska* - oligomenorrhoea due to vitiation of *Vata Dosha*, *Lohitakshaya*- oligomenorrhoea due to vitiation of *Vata-Pitta Dosha*, *Vandhya* - Infertility, *Pushpaghni- Revati*- Idiopathic anovulatory menstruation, *Abeejata* - anovulation. Vitiation of *Vata* due to genetic factors causes menstrual irregularities which may or may not be associated with anovulation. *Vishama Ahara* and *Vihara* (improper diet and activities) which causes reduced digestion and metabolism leading to immaturity of digestive extract and formation of immature *Rasa* which vitiates menstrual blood and leads to increase in *Meda Dhatu* and *Kapha* which causes obstruction of body channels and *Vata Prakopa* causing obesity and amenorrhea. *Vata* and *Kapha Doshas* as well as *Vishama Aahar* and *Vihara* leads to reduced digestive fire and causes production of *Ama* (undigested food). This *Ama* production causes improper enzymatic reaction leading to incomplete metabolism and hormonal imbalance. This hormonal imbalance causes hyperinsulinemia and hyperandrogenism ultimately leading to anovulation/amenorrhea and ovarian abnormalities like polycystic ovaries. The action of the hormones expresses the nature of the *Pitta*, the energy responsible for transformation. If *Pitta* predominates it manifests as hair loss, acne, painful menses, clots and heart problems. *Kapha*'s heavy cool qualities nourish the development of the tissues that form and support the reproductive system including the nurturing energy supporting growth of the follicle during the ovarian cycle. *Kapha* predominance manifests as increased weight, subfertility, hirsutism, diabetic tendencies and coldness. *Vata* is reliable for affecting the movement of the follicle during the ovarian cycle, the breakdown of the ovary wall for releasing the matured ovum, the movement of the fimbriae- direct the ovum into the fallopian tubes and the movement of the ovum near the uterus. The predominance of *Vata* is manifested as painful menses, scanty or less menstrual blood and severe menstrual irregularities.¹²

Ayurveda suggest that this is a *Vata* type disorder (*Apan Vayu*) through the involvement of other *Dosha* can be there but in some measure because the gynecological disorder is mainly supposed to be due to

vitiation of *Vata*. PCOS is a disorder involving *Pitta*, *Kapha*, *Medas*, *Ambuvahastrotasa* and *Artava Dhatu*. The cause of PCOS as per Ayurveda can be taken as eating excessive sweet and Kaphagenic foods, *Mandagni* because of this *Kapha* is getting aggravated in PCOS, we find *Kapha* disorder as *Pitta* and *Vata* disorder. Because of all three *Doshas* play important and distinctive role in the production, development, maturation and release of ovum and therefore the ovarian cycle and menstrual cycle is under control of three *Doshas*.¹³ The most common symptom of PCOS patient is oligomenorrhea which can be correlated to *Aartava Kshaya* in *Ayurveda*, also the mechanism of development of other symptoms like Obesity, Hyperinsulinemia are explained in *Ayurveda* as the accumulation of *Medo Dhatu* in the *Strotas* leads to the nourishment of *Medo Dhatu* only and other *Dhatu*s undergo diminution which further leads to *Medo Dhatu Vriddhi*. Sedentary lifestyle like consuming high caloric products and decrease the consumption of natural and healthy foods, resting and performing less physical activity, etc. This kind of eating behavior and physical factors may lead to *Mandagni* and production of *Ama* which further leads to *Medo Dhatu Vriddhi*. Due to above pathogenesis this may lead to rise in insulin level i.e. (Hyperinsulinemia) and weight gain which leads to obesity. These factors may affect the metabolic activity like dyslipidemia, hypercholesterolemia, PCOS. Polycystic ovary syndrome (PCOS) is a common and complex endocrine disorder that affects 5-20% of reproductive age women. PCOS clinical symptoms include hirsutism, menstrual dysfunction, infertility, obesity and metabolic syndrome. There is a wide heterogeneity in clinical manifestations and metabolic complications. The pathogenesis of PCOS is not fully elucidated, but four aspects seem to contribute to the syndrome to different degrees: increased ovarian and/or adrenal androgen secretion, partial folliculo genesis arrest, insulin resistance and neuroendocrine axis dysfunction. A definitive etiology remains to be elucidated, but PCOS has a strong heritable component indicated by familial clustering and twin studies. Genome Wide Association Studies (GWAS) have identified several new risk loci and candidate genes for PCOS.¹⁴ Polycystic ovary syndrome

(PCOS) is currently the leading cause of menstrual complications in women. It is characterized by clinical and/or biochemical hyperandrogenism, ovulation abnormalities and the presence of enlarged and/or polycystic ovaries in ultrasound images (12 or more small bubbles located circumferentially and/or ovarian volume >10 mL). It is often comorbid with hyperinsulinemia, dyslipidemia, overweight or obesity, and is a risk factor for the development of diabetes and cardiovascular diseases (CVDs). Polycystic ovary syndrome (PCOS) is a common female condition typified by reproductive, hyperandrogenic, and metabolic features. There is a close link between obesity and PCOS based on epidemiological data, and more recently corroborated through genetic studies. There are many mechanisms mediating the effects of weight-gain and obesity on the development of PCOS. The metabolic effects of insulin resistance and steroidogenic and reproductive effects of hyperinsulinemia are important mechanisms. Adipokine production by subcutaneous and visceral fat appears to play a part in metabolic function. However, given the complexity of PCOS pathogenesis, it is important also to consider possible effects of PCOS on further weight-gain, or at least on hampering attempts at weight-loss and maintenance through lifestyle changes. Possible mediators of these effects include changes in energy expenditure, mental ill health, or physical inactivity.

Methods

The Pubmed database search was done using the phrase "polycystic ovary syndrome". This search yielded various research papers and some of them were selected for the study and their relevant references. The study has a correlation of pathological factors of modern medicine with the *Doshas* explained in *Ayurveda* which leads to the development of PCOS.

DISCUSSION

PCOS symptoms can result in remarkable worsening of life quality and may be highly stressful, adversely affecting psychological, social well-being. Inconsistent diagnostic criteria, lack of challenges for the care of women with PCOS. These factors encourage inaccurate diagnosis. This unfavorable diagnostic experience

affected the women life. Recognition of these issues for the better understanding of disease pathway is much more needed. From this review article it is observed that the disease like PCOS involves the combination of symptoms explained as per modern and *Ayurvedic* view and its exact pathogenesis is not fully elucidated. Each individual's body has different mechanism to develop a disease. So, in this article *Ayurveda* explained the common pathogenesis conditions step wise which are responsible for the development of any type of disease. Modern science explained the condition as a result of hampered normal metabolic and systemic pathway. Here found some pathological factors which can correlate with the features explained in *Ayurveda*. This article uses the evidence to inform the suggestions regarding known and unknown factors which affects the routine or health of women.

CONCLUSION

By the outlook of the pathogenesis of PCOS as per modern description, it becomes clear that even though they are not compiled as a syndrome in *Ayurveda* most of them have been described as features of separate disease or conditions. If we summarize this than we can find these symptoms in *Ayurveda* as: Menstrual irregularities have been described under *Artava Vyapadas* or *Yonirogas* (uterine disorders). Anovulation is included under *Vandhyatva* (infertility). Obesity is the condition described as *Sthaulya*., Hyperinsulinemia leads to type 2 Diabetes mellitus, and is described under *Prameha*. It is also manifested as a complication of *Sthaulya*., Since menstrual irregularities including anovulation and obesity are the commonly seen symptoms these two has to be taken care with due attention.

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