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A Review on PCOD And Its Management

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Abstract: Polycystic ovary Disease (PCOD) is a common endocrine disorder that affects reproductive-aged women. It is characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovarian morphology. The exact cause of PCOD is not fully understood, but it is believed to be related to a combination of genetic and environmental factors.

The management and treatment of PCOD vary depending on the individual's symptoms and goals. Lifestyle modifications such as weight loss, exercise, and a healthy diet can be effective in managing symptoms such as irregular menstrual cycles and insulin resistance.

Medical management of PCOD typically involves hormonal therapies such as oral contraceptives, antiandrogens, and insulin-sensitizing agents. Fertility treatments such as ovulation induction and in vitro fertilization can also be used for women who wish to conceive.

In conclusion, PCOD is a common condition that can significantly impact a woman's health and quality of life. Appropriate management and treatment can help to alleviate symptoms and improve overall health outcomes. A multidisciplinary approach that includes lifestyle modifications, medical management, and fertility treatments, when necessary, can provide optimal care for women with PCOD.

Key Word: **PCOD: Polycystic Ovary Disease**

1.INTRODUCTION

About 10% of women of reproductive age have polycystic ovarian Disease, often known as infertility queen, which is a systemic endocrine and metabolic condition. It was formerly called as Stein Leventhal Syndrome and features oligo/amenorrhea, hirsutism, obesity, enlarged ovaries with numerous tiny cysts, thickened tunica, and other symptoms (Stein and Leventhal,1935). [1] Almost 10 million people worldwide are impacted by it. The current incidence of PCOD (5–6%) is rapidly rising due to stress and changing lifestyles. The prevalence of polycystic ovarian syndrome is typically believed to be between 3% and 10%, but it varies by ethnicity and region for particular subpopulations.[2] Depending on the research population, the prevalence of polycystic ovarian syndrome in India ranged from roughly three to twenty-two percent.[3] According to the study, 18% of Tamil Nadu residents had PCOD (based on Rotterdam's criteria), whereas rates in Maharashtra and south India were between 9% and 22% and 10.7% (by the standards of the Androgen Excess Society), respectively.[4] It is well known that this ailment is a lifestyle disease. It has a close connection to the metabolic syndrome caused by tissue-level insulin resistance and associated hyperinsulinism. A significant portion of women are affected. [5] Moreover, a Endometrial cancer (EC) and PCOD

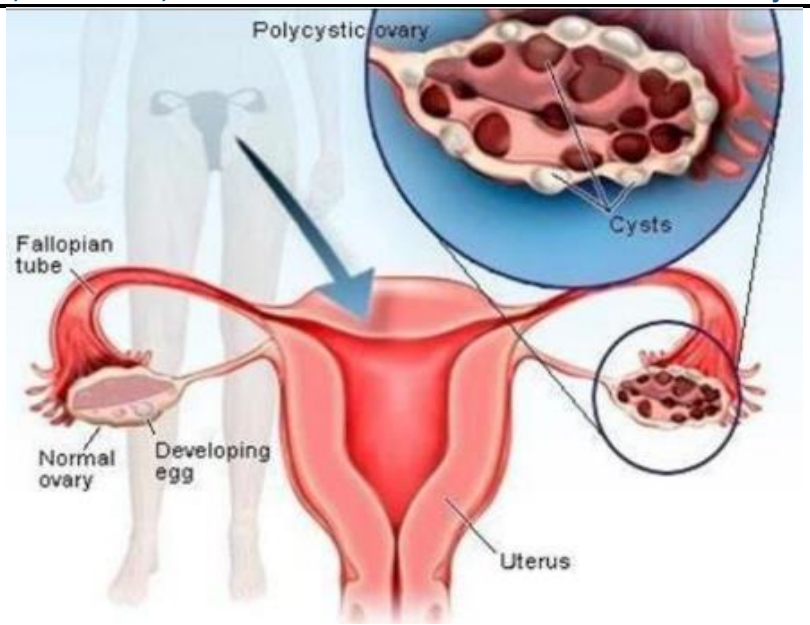


Fig. No 1.1

have intricate relationships that have been known for some time, and a number of risk factors, such as diabetes, obesity, anovulation, and nulliparity, are implicated. [6] Because of the variety of symptoms, PCOD is actually a syndrome rather than a disease. It suppresses not just one disease process but a number of disease processes. It is a condition that people have long disregarded, [7]

1.1. HISTORY:

Drs. Stein and Leventhal documented a number of amenorrheic women with polycystic ovaries in 1935. [8] Other diagnostic classifications concentrating on the clinical symptoms were subsequently created. The 1990 NIH Criteria, the 2003 Rotterdam Criteria, and the 2006 Androgen Excess-PCOD Criteria were all included in these classifications. These classifications, however, varied, resulting in uneven diagnostic criteria that impede the diagnosis and examination of PCOD-positive women. A further factor hindering a thorough knowledge of this condition is the prevalence of severely affected women in the majority of the current studies. [9] Lack of agreement and inconsistent provider understanding have resulted in improper diagnosis, including underdiagnosis, overdiagnosis, and misdiagnosis. Underdiagnosis and delayed diagnosis are common, which increases patient angst and mistrust while also reducing options for intervention and prevention. [10] Study among women who experienced delayed diagnosis emphasises the need of averting such a situation and giving them knowledge about their symptoms and worries. Research further demonstrates that patient discomfort is not caused by the diagnosis itself but rather by the associated comorbidities. Anxiety over the potential hazards of infertility, diabetes, cardiovascular disease, and obesity may be brought on by an overdiagnosis or a mistake. [11] Misdiagnosis may lead to unneeded exposure to oral contraceptive, spironolactone, or metformin adverse effects. Inaccurate health insurance labelling that can make it more difficult to get future health insurance coverage is another negative effect of misdiagnosis. Adolescence is when several PCOD symptoms like irregular menstrual cycles, acne, and multi-follicular ovarian shape may first appear. These characteristics, which are part of normal pubertal development, can, however, hinder a prompt and correct PCOD diagnosis. As a result, it may be overlooked to take advantage of appropriate opportunities to prevent and treat related comorbidities, particularly during the transition to adult health care providers. [12] A paediatric endocrinology international update was motivated to raise PCOD awareness by the realisation of numerous problems in the diagnosis and treatment of teenage and emerging adult women with the condition. [13] The International Evidence-Based Guideline for assessment and management of PCOD across the lifespan was subsequently developed through an international collaboration encompassing 38 societies and 71 nations. Patients (consumers) were included in multi-disciplinary guideline development groups that were set up to methodically assess the evidence that was available and generate practise recommendations utilising careful methodologies. The Assessment of Guidelines for Research and Evaluation-II process was applied to this guideline. Infertility assessment and management are covered in the five broad areas of lifestyle interventions, pharmacological treatment for nonfertility indications, screening, diagnosis, and risk assessment during life stages, emotional well-being screening, diagnosis, and treatment, and infertility assessment and management that result from the rigorous examination. 15 These recommendations place a strong emphasis on precise diagnosis, as well as the avoidance, detection, and management of PCOD-related comorbidities. . Three groups of common comorbidities can

be distinguished: reproductive, metabolic, and psychological. Hyperandrogenism, irregular menstruation, subfertility, and pregnancy difficulties are among the reproductive comorbidities. Insulin resistance, hyperinsulinemia, obesity, dyslipidemia, impaired glucose tolerance (IGT), type 2 diabetes mellitus (T2DM), hypertension, and risk factors for cardiovascular disease are some of the metabolic comorbidities. Anxiety, sadness, eating disorders, low self-esteem, psychosexual dysfunction, and a poor quality of life are some of the psychological comorbidities (QoL). The financial, emotional, and physical tolls associated with chronic comorbidities are significant. These international principles promote high standards for clinical practise and provide a wealth of e-health resources for both women and medical professionals. We will concentrate on the diagnosis, clinical manifestations, and prevention of the comorbidities associated with PCOD throughout a woman's lifetime given the influence of PCOD on women's health. [14]

1.2. SYMPTOMS:

Later, in your twenties or thirties, symptoms such as the onset of your first period or potential health problems began. Although the symptoms vary from woman to woman, at least two of the following must be present in order to be diagnosed with polycystic ovarian syndrome:

1. Absent periods
2. Acne not associated with puberty
3. Darkening of the skin
4. Excessive hair growth
5. Fatigue
6. Fluid retention
7. Heavy or prolonged periods
8. Infertility
9. Irregular periods
10. Male pattern baldness
11. Menstrual pain
12. Mood swings
13. Ovarian cysts
14. Weight gain

1.3. CAUSES:

1. Genetic predisposition
2. Strong stimulation in adrenals in childhood
3. Raised insulin levels
4. Contraceptive pills
5. Hormonal imbalance
6. Stress [**15**]

1.4. RISKS:

Women with PCOD are at risk for the following

1. Endometrial Cancer
2. Insulin resistance Type II diabetes
3. Hypertension
4. Cardiovascular disease
5. Weight gain
6. Osteoporosis
7. Miscarriage[**16**]

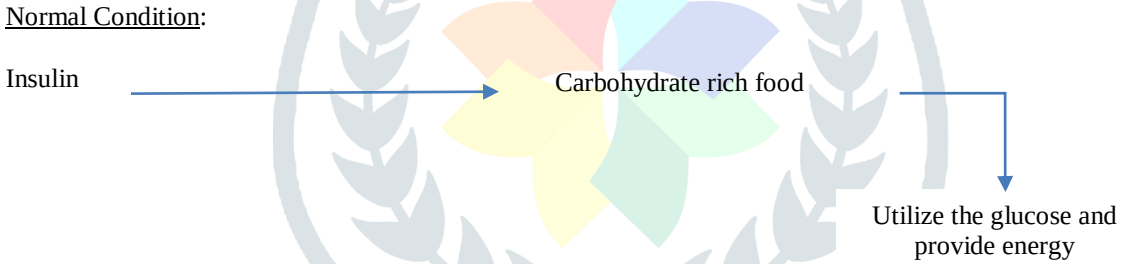


Fig No: 1.2

1.5 .PATHOLOGY:

Both of the ovaries are enlarged macroscopically. The ovary displays a large tunica albuginea capsule. Although there is a risk for lobulated ovarian surface, the periphery may be devoid of adhesions. The ovarian surface is dotted with numerous cysts (12 or more), ranging in size from 2 to 9 mm, giving it the appearance of an ultrasound necklace. These are the persistent atretic follicles. An increase in ovarian size of more than 10 cm3 in volume is caused by theca cell and stromal hyperplasia[17].

1.6. PATHOPHYSIOLOGY:



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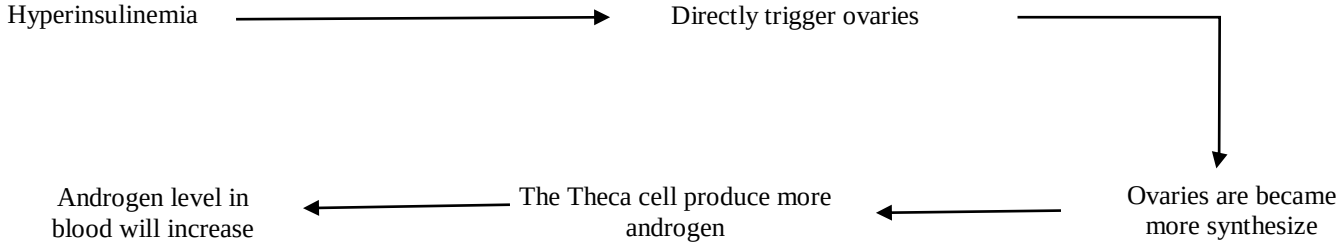
But in PCOD it is not work properly there is a insulin resistance in those women For the insulin resistance when the proper uptake of glucose is not occur and the pancreas producing more insulin and it is called as **Hyperinsulinemia**



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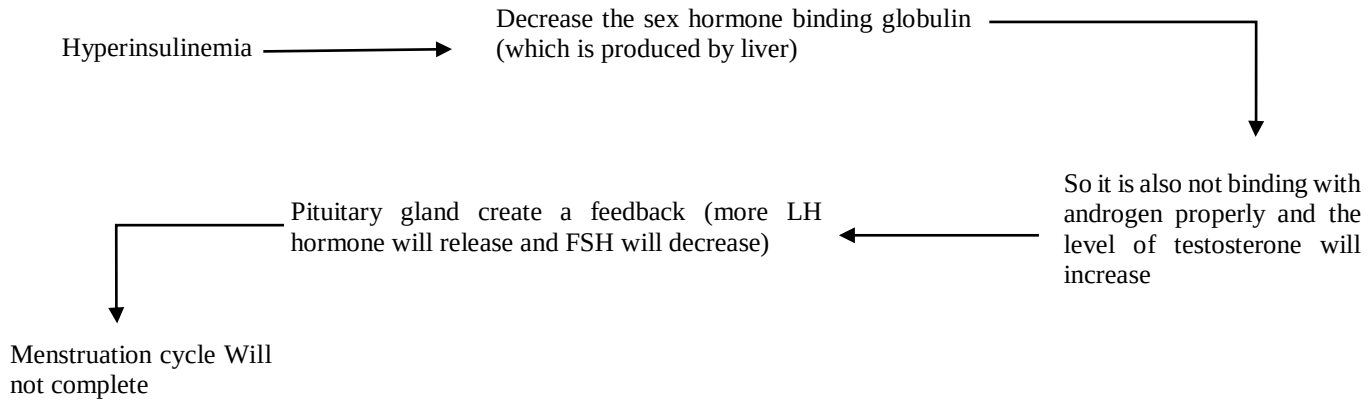

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1.7. DIAGNOSIS:

Rotterdam standards, The presence of any two of the next three criteria is required for a diagnosis to be made. [2003 European Society for Human Reproductive Embryology (ESHRE)/American Society for Reproductive Medicine (ASRM)] .

1. Oligomenorrhoea/amenorrhoea, anovulatory infertility, and
2. clinical/biochemical hyperandrogenism
3. Ultrasound results (Polycystic Ovary) [18]

Oligomenorrhoea: A woman who experiences erratic and uneven menstrual blood flow is said to have oligomenorrhoea. After menarche, after childbirth, or throughout the perimenopausal stage, some variation in menstrual flow is typical. Nevertheless, oligomenorrhea is the term used when a woman reports a menstrual cycle that lasts longer than 35 days or four to nine cycles in a year. [19]

Before oligomenorrhea begins to develop, menstrual flow should be regular. [20]

1.8. ETIOLOGY:

Oligomenorrhea frequently indicates an underlying illness. The following may be oligomenorrhea's causes.

- Polycystic ovarian disease[21]
- Androgen secreting tumor of the ovary[22]
- Androgen secreting tumor of the adrenal gland[23]
- Cushing syndrome
- Hyperthyroidism
- Prolactinomas
- Hypothalamic amenorrhea[24]
- Pelvic inflammatory disease

- Asherman syndrome
- Uncontrolled diabetes mellitus
- Type-1 diabetes mellitus[25]
- Congenital adrenal hyperplasia[26]
- Non-classic congenital adrenal hyperplasia.
- A side effect of oral contraceptive pills[27]
- Antipsychotics
- Antiepileptics
- Anatomic problems
- Primary ovarian insufficiency[28]
- Exercising women with polycystic ovarian disease. [29]

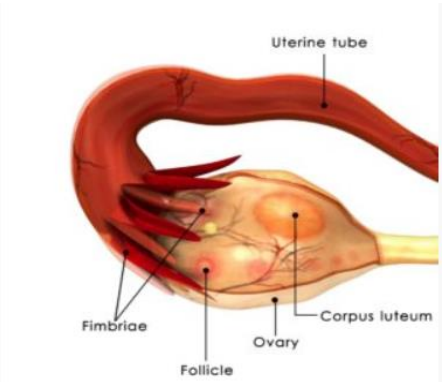

Fig No: 1.6

1.9. EPIDEMIOLOGY:

The following lab tests are used to determine the cause of oligomenorrhea:

Blood Tests:

- FSH Levels: Elevated levels indicate primary ovarian insufficiency. [30]
- TSH levels; if they fall, hyperthyroidism is present. [31]
- Prolactinoma may be the cause if prolactin levels are elevated. [32]
- LH levels; polycystic ovarian disease can be diagnosed using the FSH/LH ratio.
- Elevated free testosterone levels in polycystic ovarian disease and congenital adrenal hyperplasia. [33]
- Levels of 17-OH are helpful in identifying congenital adrenal hyperplasia as the cause of oligomenorrhea.
- An overnight dexamethasone suppression test is used to rule out Cushing syndrome as the cause of oligomenorrhea, particularly in cases where the patient exhibits symptoms of this disorder.
- HbA1C[34]

1.10. INVESTIGATIONS:

6 to 60% of sportsmen and 11 to 44% of dancers report having oligomenorrhea at some time in their lives. In the general population, oligomenorrhea affects 13.5% of women. For 4 to 10% of women of reproductive age who experience oligomenorrhea, the cause is a polycystic ovarian condition (from puberty to menopause).

1.11. EVALUATION:

- Abdominal and pelvic ultrasound; it may reveal polycystic ovaries, pelvic inflammation, and ascites.
- When there is a possibility of adrenal or adnexal masses, a CT scan is helpful.
- Prolactin levels rising indicates prolactinoma, which is confirmed by an MRI of the pituitary.
- If there are indications of pelvic inflammatory illness, endocervical swabs are taken.

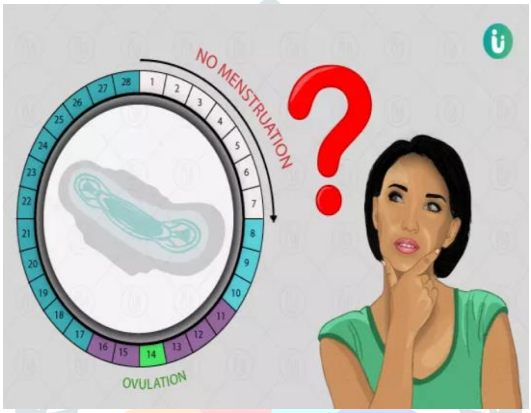

Fig No: 1.7

1.12. MANAGEMENT:

The primary factor influencing oligomenorrhea treatment is the underlying cause;

1.12.1LIFESTYLE CHANGES:

Oligomenorrhea can be treated with behaviour modification, diet, psychotherapy, and stress reduction strategies when low basal metabolic index and high amounts of stress are the underlying causes. When obesity is the cause of anovulatory problems, weight loss is a management option.

1.12.2HORMONAL THERAPY:

Especially in cases with polycystic ovarian disease, birth control tablets are frequently used to restore the regularity of the monthly cycle. Particularly when the patient does not want to become pregnant, they are safe to use.

1.12.3TREATING THE UNDERLYING MEDICAL CONDITIONS:

If hyperthyroidism is the underlying reason, treatment options include radioactive iodine, thyroid surgery, and antithyroid medications. If Cushing syndrome is the cause, it is treated with drugs that stop the overproduction of cortisol, such as ketoconazole, mitotane, and metyrapone. If prolactinomas are mild, dopamine agonists like bromocriptine and cabergoline can be used to treat them.

1.12.4SURGICAL MANAGEMENT:

- Adnexal tumours and adrenal tumours may require surgery.

- Thyroid surgery can be required for hyperthyroidism.
- Prolactinoma may need to be surgically removed if it is large enough to cause compressive symptoms.

1.13. HYPERANDROGENISM:

The disorder known as hyperandrogenism occurs when a woman's level of androgens (male hormones) rises over what is considered normal. Ovarian and extraovarian hyperandrogenism is regarded as one of the main symptoms of PCOD. The androgen production that takes place in the ovarian cells' theca cells contributes to the hyperandrogenic state [35]. The most prevalent hyperandrogenic conditions include 21 hydroxylase deficiency, PCOD, and idiopathic hyperandrogenism. The level of testosterone in PCOD patients will be significantly higher than that in the normal range. The levels of total testosterone, free testosterone, SHBG, androstenedione, and dehydroepiandrosterone are typically used to diagnose hyperandrogenism (DHEA). The formula for calculating the free androgen index (FAI) is FAI = (Total Testosterone/SHBG) 100 [36]. Although though testosterone is a male reproductive hormone, women also release modest amounts of androgens as part of regular metabolic activity. Typically, the quantities of androgens produced by the ovaries and adrenal glands in women are nearly identical [37]. Increased levels of ovarian androgen are thought to be a common sign of hyperandrogenism in PCOD, which impairs follicular maturation by possibly negatively affecting follicular growth and causing atresia. In PCOD, the ovaries are typically thought to be the primary source of androgen excess, although it has been discovered that 20 to 30% of patients have elevated levels of adrenal androgen [38, 39]. According to certain scientific studies, there is a strong correlation between the excess of ovarian androgen and the excess of adrenal androgen in PCOD patients. Adrenal hyperandrogenism is only seen in a very small minority of patients. Adrenal hyperandrogenism could not be investigated at the molecular level due to the hazards associated with collecting the adrenal glands from the patients. Sufficient research has demonstrated the ovarian androgen excess as a prominent criterion in PCOD women at the molecular level.[40,41] When the liver produces less sex hormone binding globulin SHBG as a result of hyperinsulinaemia, there is an increase in the amount of free testosterone in the blood [42]. According to some studies, the elevated levels of adrenal androgens in PCOD-afflicted women may be responsible for the increased insulin levels.[43] Several hyperandrogenic diseases have distinct androgen sources. While in idiopathic hyperandrogenism both the ovaries and the adrenal glands are known to contribute to the androgen excess, the ovary serves as the primary androgen source in PCOD [44]. The adrenal gland appears to be in charge of the excess androgen in the non-classic 21 hydroxylase deficiency [45].



Fig No: 1.8

1.14. POLYCYSTIC OVARY:

Ovarian follicular arrest, which usually occurs in PCOD, is characterised by the inhibition of follicle maturation and the development of cysts, which are fluid-filled sacs. One notable characteristic in the PCOD diagnosis is the presence of polycystic ovaries. The PCOD diagnosiscondition is based on the presence of an excessive number of developing follicles as well as the existence of enlarged cysts [46]. Although PCOM is omitted in some PCOD phenotypes, the presence of poly cystic ovarian morphology (PCOM) is a diagnostic requirement for PCOD. According to numerous studies, ovarian size, taking into account

ovarian volume and ovarian area, is an important factor in the diagnosis of PCOD. Women with polycystic ovaries may occasionally not have PCOD [47].

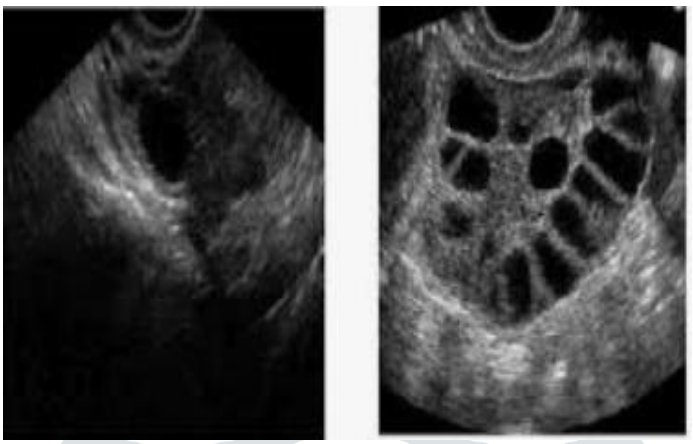

Fig No: 1.9

1.15. TREATMENT:

1.15.1 HOMEOPATHIC TREATMENT:

1.15.1.1 INTRODUCTION: The fundamental issue is addressed through homoeopathy in order to normalise the serum testosterone level. The hair growth slows down with time, and the related issues are also resolved at the same time. A case can be used to show it. The fingerpost at the crossroads of healing that points the route to a secure and long-lasting cure is homoeopathy. Homeopathy promotes the natural world. All homoeopathic medications have been tested on humans. It is quite polished. It enhances modern living comfort. The drugs have no harmful side effects. They are secure, efficient, and simple to get well with. Homeopathic drugs are administered to naturally stimulate ovulation rather than to cause menstruation. Homeopathic medications won't induce artificial menstruation. They abide with the natural order. The condition is managed by the system. Ovulation and menstruation can be achieved naturally by taking homoeopathic medications.

1.15.1.2. HOMOEOPATHIC THERAPEUTICS IN PCOD:

Other than hormonal therapy and lifestyle changes, there is no known cure for PCOD in contemporary medicine. According to the dynamising principles of homoeopathy, which emphasise the patient's physical and psychological welfare, a well-indicated constitutional remedy based on the totality of symptoms can be effective. Given on the basis of similarities, medications like Natrum Mur, Pulsatilla, Apis, Ignatia, Calc. carb, Kali brom, Sepia, etc. have a significant impact and are also prescribed in the majority of PCOD cases. Nonetheless, indigenous, uncommon, and other medicines may be taken into consideration when polychrest or constitutional therapies are not suggested or do not provide relief [8]. There are other uncommon medications that also have significant effects in PCOD instances but are typically ignored by the prescribers. Symptoms and characteristics of lesser-known homoeopathic **TREATMENTS** for PCOD include:

1.15.1.2.1 Aurum iodatum: Ovarian cyst, uterine myomata [9]. Ovarian ovulation duration. definite craving for fresh air. extraordinary thirst [10].

1.15.1.2.2Aurum muriaticum natronatum: Ovaries were inflamed. abdomen's coldness. Leucorrhoea combined with spasmodic vaginal contractions [9]. ovarian and uterine tumours without symptoms. Atonic amenorrhea, scanty and erratic menstruation, insufficient libido, ovarian torpor-related infertility, and ovarian dropsy [10] are among the symptoms.

1.15.1.2.3. Eupionum: ovary on the right burning. Leucorrhoea that flows. Yellow leucorrhoea and a terrible pain after menstruation. Sacrum hurts like it's broken. intense perspiration even with minimal effort [9].

1.15.1.2.4. Gossypium herbaceum: Ovarian pain that comes and goes. Before breakfast, you have morning sickness with saliva flow and a sensitive uterine area. menstruation that is suppressed. Back pain, weight, and pelvic dragging[9, 10].

1.15.1.2.5. Oleum jecori aselli: establishes the menstrual flow and, if it becomes erratic, returns it. abnormal facial hair growth. a yellow diarrhoea. Everywhere there is pain [10].

1.15.1.2.6. Oophorinum/ Ovininum: following an ovariotomy, agony. broad climatic disturbances. cysts on an ovary. Rosacea and acne-related skin conditions [9].

1.15.1.2.7. Ova tosta: Leucorrhoea that is excessive and unpleasant with symptoms like the back is being cut in half and tied with a string [9].

1.15.1.2.8. Chronic oophoritis: palladium metallicum. Right ovarian area achy and swollen. Pelvic pains that are bearing down and are shooting or scorching; relief from rubbing. ache and sharp pain that travels from the navel to the breast. Affected right ovary [9].

1.15.1.2.9.Senecio: Suppressed or delayed menstruation. Young females with back pain who have functional amenorrhea. Inflammatory bladder, chest, and throat conditions that occur before periods. They get better as menstruation starts [9]. Ovarian to breast pain [10]. [12]

1.15.2Ayurvedic Treatment:

i. Shandi Yoni Vyapad (C.S.): "Bijdoshattu garbha sthmarutophatshya. Nradweshinyastani chaiv shandi syadanupkramah"(C.S.Ch. 30/34-35)

- A congenital condition (bijadosha).
- breasts not developing or developing very slightly;
- dislike of coitus;
- incurable disease.

ii. Shandi Yoni Vyapad (S.S.): "Anartavstna shandi kharsparsha cha maithune. Chasrashvapi chadhyasu sarvlingochhitirbhavet" (S.S.Ut. 38/18-20).

- Primary amenorrhea (anartava);
- lack of breast growth (astana);
- ability to reproduce, but rough vaginal canal.

iii. Bandhya: "Yada hyasyah shonite garbha shyabeejbhagah pradoshmapadyate. Tada bandhyam janyati" (C.S.Sh. 4/30). If a portion of the bija responsible for the development of the uterus is deficient, the resultant girl infant will be bandhya (chromosomal genetic disorders) (infertile)

iv. Bandhya Yoni Vyapad: "Bandhyam nashtartvam vidhyat chashrastpichadyasu bhavantyanilvednah" (S.S.Ut. 38/10-11).

- Has breast development (the one characteristic that sets shandi apart)
- Has amenorrhoea (nastratava considered as destruction of artava of female foetus).

v. Vikuta Jatiharini: "Kalvarnapramanerya vishmam pushpamrichhati. Animittbalglanirvikuta nam sa smrita" (Ka.S.K. 6/34-35).

- Menstrual irregularities such oligomanorrhea and
- excessive or insufficient menstruation (metabolic manifestation).

vi. Pushpaghni Jatiharini: "Vritha pushpam tu yo nri yathakal prapashyati. Sthulalomashganda vpushpaghni sa api revati" (Ka S.K.6/32-33).

Woman menstruate at due time, however it is ineffective (vyathpushpa, or anovulatory cycle). Has hirsutism, or chubby cheeks with hair, which may be caused by hyperandrogenism.

Therefore it appears that Pushpaghni Jatiharini is more similar to polycystic ovarian syndrome. Acharya Charak's description of the sthula purusha (fat person) in the ashtanindiya (censurable person) has eight flaws listed, including polyuria, polydipsia, and short life. This disease might mimic hyperinsulinemic syndrome. A censurable individual is also an atiloma with profuse hair growth. The first two symptoms may be signs that a woman has PCOD. [1]

1.15.2.1herbal treatment for PCOD in Ayurveda:

Using a multi-pronged strategy, ayurvedic treatment aims to:

• Correct hormonal imbalance;

• Cure obesity and lower cholesterol levels;

• Address insulin resistance.

1.15.2.1.1 Liquorice: Botanical Name: Glycyrrhiza glabra, Family: Leguminosae.

In the luteal phase of the menstrual cycle, nine healthy women between the ages of 22 and 26 examined the impact of licorice on androgen metabolism. For two cycles, they received 3.5 g of a commercial licorice preparation containing 7.6% W/W glycyrrhizic acid each day. [48] They weren't receiving any other medical care. Radioimmunoassay was used to evaluate plasma renin activity, serum adrenal and gonadal androgens, aldosterone, and cortisol. Within two months, the total serum testosterone level gradually fell. After treatment was stopped, it went back to its previous levels. Licorice can lower serum testosterone, most likely as a result of the enzymes 17-hydroxysteroid dehydrogenase and 17-20 lyase being blocked. Licorice may be used as a complementary treatment for hirsutism and polycystic ovary syndrome.



Fig No: 1.10

1.15.2.1.2 Aloe-vera:

Botanical Name: Aloe barbadensis, Family: Liliaceae.

In a study, the effectiveness of an Aloe vera gel formulation was evaluated in a rat model of PCOD. Letrozole, a non-steroidal aromatase inhibitor, was orally administered to five-month-old female Charles Foster rats to elicit PCOD. The Aloe vera gel concoction was then administered orally to the rats (1 ml dose daily for 45 days). Their steroidogenic activity, glucose sensitivity, and estrus cyclicity were all recovered as a result. [49] The development of



Fig No: 1.11

the PCOD phenotype was stopped by combining the inductive drug (letrozole) with the aloe vera gel. By restoring the ovarian steroid status and changing important steroidogenic activity, aloe vera gel formulation has a protective impact against the PCOD phenotype. This is explained by the phytocomponents in the extract.

1.15.2.1.3 Flax Seed:

Botanical Name: Linum usitatissimum, Family: Linaceae.

In a study, the hormonal responses to flaxseed supplementation (30 g/day) in a 31-year-old PCOD patient were noted. The patient consumed 83% of the recommended flaxseed dose over the course of four months. Body Mass Index (BMI), insulin, total serum testosterone, and free serum testosterone levels all significantly decreased between baseline and the 4-month follow-up in height-weight measurements and fasting blood samples. By the end of the research period, the patient also noted a reduction in hirsutism. the hirsutism documented in this case study, along with a clinically substantial decline in testosterone levels. [50]



Fig No: 1.12

1.15.2.1.4 Gymnema sylvestre (Gymnema):

Gymnema is a common Ayurveda herb that supports weight loss and is used as an anti-diabetic, hypoglycemic, lipid-lowering, and anti-lipid agent. Gymnema may have trophorestorative effects on the pancreatic beta cells. The leaf is the plant portion used in medicine. Due to its ability to modulate insulin and the additional advantages of lowering the high triglycerides related to PCOD, gymnema is a good candidate for treating PCOD. [51] Saponins, particularly gymnemic acids, are important Gymnema components. Gymnemic acid conceals the sweet flavour when taken before food since it lowers the sweet taste on the taste buds. Gymnema has proven to have hypoglycemic effects in diabetic experimental models and to control blood sugar levels in hyperglycemia. The suppression of glucose absorption in the gut is another component of the mechanism of action. Gymnema is taken orally as 3.5 to 11 mL of 1:1 liquid extract daily. Gymnema may prove to be one of the most important herbs in the treatment of the underlying factor of insulin resistance because current medical models are focusing on pharmaceutical agents like metformin to regulate PCOD.



Fig No: 1.13

1.15.2.1.5 Fennel Seeds:

Fennel seeds contain anti-hirsutism characteristics and are thought to help treat PCOD by lowering levels of androgen (male hormones).



Fig No: 1.14

1.15.2.1.6 Cinnamon

Botanical Name: Cinnamomum zeylanicum, Family: Lauraceae.

By boosting phosphatidylinositol 3-kinase activity in the insulin signalling pathway and so potentiating insulin action, cinnamon extract has been proven in in vitro and in vivo experiments to improve insulin resistance. During eight weeks, 15 PCOD patients were randomly assigned to receive either daily oral cinnamon or a placebo. [52] Fasting and 2-hour oral glucose tolerance tests used to compare post-treatment to baseline insulin sensitivity indices revealed significant improvements in insulin resistance in the cinnamon group but not in the placebo group.



Fig No: 1.15

1.15.2.1.7 Stinging Nettle (Urtica Dioica):

The creation of SHBG (sex hormone-binding globulin), which is increased by this plant's root and lowers blood levels of free testosterone, contributes to the normalisation of hormone levels. Women with polycystic ovarian syndrome frequently have low SHBG levels.

Side effect: The use of nettle root should not be prolonged. Do not take this herb if you are on diuretics or a blood pressure-lowering medicine because it can drop blood pressure.



Fig No: 1.16

1.15.2.1.8 Green Tea:

The strong antioxidants found in green tea, specifically catechins, are what reduce the hormone levels that cause ovarian cysts and other associated symptoms. The antioxidants in green tea also help to regulate insulin levels. Daily green tea consumption has an effect on PCOD-related weight gain and aids in your effort to lose this extra weight.



Fig No: 1.17

1.15.2.1.9 Amla:

Amla is a fantastic cholesterol-lowering and detoxifying supplement. Its anti-inflammatory and free radical scavenging properties can aid in reestablishing the body's hormonal balance.



Fig No: 1.18

1.15.2.1.10 Sesame Seeds:

Patients with PCOD can benefit from the minerals found in sesame seeds. Its beneficial fats aid in controlling blood sugar levels. Moreover, it includes minerals like calcium.

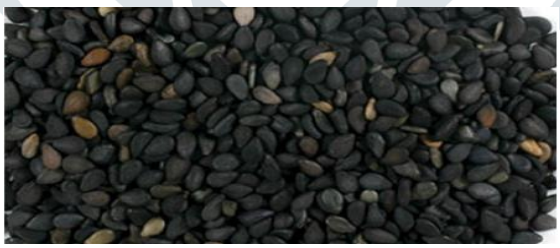

Fig No: 1.19

1.15.2.1.11 Pumpkin Seeds:

Pumpkin seeds also include the beneficial omega-3 fatty acids that can help control the elevated insulin and cholesterol levels associated with PCOD. They also include beta-sitosterol, which can reduce too much androgen and treat PCOD symptoms like hirsutism, acne, and weight gain. [53]



Fig No: 1.20

1.15.2.1.12 Tulsi:

Because the ovulation process does not occur, androgens are not used. Moreover, liver produces very little SHBG protein. Women experience difficulty conceiving, increased facial hair growth, and acne because of this. Tulsi can reduce insulin levels and regulate androgens. It works wonders as an antioxidant. At least ten leaves should be chewed on an empty stomach in the early morning. regularly consume boiled tulsi water.



Fig No: 1.21

1.15.2.1.13 Curcumin:

In female Wistar rats with Letrozole-induced PCOD, curcumin shown therapeutic effects. Its effects were comparable to those of Clomiphene citrate, the most popular medication for PCOD ovulation induction.



Fig No: 1.22

1.15.2.1.14 Chaste berry (Vitex agnus-castus):

One of the most popular herbs used to treat PCOD is chaste berry since it aids in stimulating and stabilising the pituitary gland's function. Luteinizing hormone, which can lower levels of oestrogen and androgen while increasing levels of progesterone, is released by the pituitary gland.

Side effect: Although this herb is not known to have many serious adverse effects, it can cause nausea, rash, and dizziness. Women who are pregnant or on birth control pills should avoid this plant because it affects hormones. Chaste berry should not be consumed by those using dopamine-related medications, such as Parkinson's meds or antipsychotics.



Fig No: 1.23

1.15.3 ALLOPATHIC TREATMENT: Allopathic medicine, sometimes known as allopathy, is a derogatory phrase used to describe modern, scientific medicine.

Medications:

A doctor can suggest one of the following to control periods:

• Combination birth control tablets. Estrogen and progestin-containing pills reduce androgen production and control oestrogen. By balancing your hormones, you can reduce your chance of endometrial cancer and get rid of acne, unwanted hair growth, and irregular bleeding.

• The use of progestins. Your cycles can be controlled and endometrial cancer can be avoided by taking progestin for 10 to 14 days every one to two months. This progestin medication won't stop pregnancy and doesn't raise testosterone levels. If you also want to prevent conception, the progestin-only minipill or progestin-containing intrauterine device is a preferable option.

Your doctor may advise the following to assist you in ovulating so that you can get pregnant:

- Clomiphene: Use this oral contraceptive during the initial phase of your menstrual cycle.
- Letrozole (Femara): This breast cancer treatment can work to stimulate the ovaries.
- Metformin: This oral type 2 diabetes medication enhances insulin resistance and reduces insulin levels. Your doctor may advise adding metformin to assist you ovulate if you are on clomiphene and are unable to become pregnant. Metformin can help you lose weight and delay the onset of type 2 diabetes if you have prediabetes.
- Gonadotropins: These hormone medicines are administered intravenously.

If necessary, discuss possible methods to aid in conception with your healthcare physician. In vitro fertilisation is one such possibility.

Your doctor may advise the following to treat acne or lessen excessive hair growth:

contraceptive tablets. These pills limit the production of androgen, which can lead to acne and excessive hair growth.

Spironolactone (Aldactone): The effects of androgen on the skin, such as increased hair growth and acne, are blocked by this medicine. While using this drug, effective birth control is required because spirolactone might lead to birth abnormalities. If you are pregnant or intend to become pregnant, you shouldn't use this drug.

Eflornithine (Vaniqa): This lotion can slow the growth of facial hair.

hair removal: There are two methods for getting rid of hair: electrolysis and laser hair removal. Each hair follicle is punctured by a small needle during electrolysis. Electric current pulses out of the needle. The follicle is damaged by the current before being destroyed. A focused light beam is used during the medical treatment of laser hair removal to remove unwanted hair. You might require a number of electrolysis or laser hair removal sessions. Other treatments include shaving, hair removal by plucking, or lotions that destroy unwanted hair. They are only temporary, and as the hair regrows, it could become thicker.

acne remedies: Acne may be improved with medications, including oral pills and topical creams or gels. Discuss your choices with your healthcare practitioner.

1.15.4 YOGA IN PCOD:

Yoga is a complete remedy for a healthy body and mind that can eradicate PCOD's primary causes, stress and obesity. Yoga is also an excellent stress reliever because stress in women's lives can actually cause undesirable weight gain. The production of the stress

hormone cortisol, one of the main factors in the body's storage of fat, is reduced when one enters a tranquil condition. Yoga simply promotes stepping beyond of one's comfort zone in order to, perhaps, better comprehend oneself from a very different perspective. leads to an improvement in life quality.



Fig No: 1.24

1.15.4.1 How Can Yoga Help Women with PCOD?

The science of yoga targets stress and obesity as the primary causes of PCOD. Yoga goes well beyond merely the level of the physical body. Yoga helps to relieve deeply buried tension in the system, which can help reduce PCOD symptoms.

1. Maintaining positions that require weight improves muscle. In consequence, increasing muscle mass helps to reduce insulin resistance - one of the keys to PCOD control.
2. A vigorous yoga practise raises heart rate, resulting in a cardio workout and weight loss.
3. By promoting hormonal balance and profound relaxation, asanas and pranayama can help stressed-out PCOD brains and bodies stabilise their adrenal and cortisol levels.
4. To bring the body into balance and stimulate energy systems that may be sluggish in women with PCOD, specific poses are described in the yoga and ayurvedic traditions.

   Nevertheless, the advantages of yoga for PCOD-affected individuals go beyond the physical. Yoga means "to unify," and contemporary yoga practise unites the body, mind, breath, and spirit.

1.15.5 Unani Treatment:

Several unani doctors have given vivid descriptions of PCOD under the titles of ehtebase tams and uqr in the unani system of medicine. Sue mizaj barid, or abnormally cool disposition, of the liver has been linked to aberrant phlegm production. Cysts could grow in the ovaries if khilte balgham (phlegm) is dominant. Infertility in females caused by obesity and PCOD, as characterised by modern medicine, is remarkably similar to uqr in unani medicine in terms of its causes and characteristics. Unani doctors noted a mix of symptoms that are suggestive of PCOD, such as hirsutism, obesity, acne, hoarseness of voice, and infertility, together with monthly irregularities such amenorrhoea, oligomenorrhea, and DUB. It is also stated that women have amenorrhea if their mizaj changes to a more masculine state and exhibits traits like male pattern hair growth and hoarseness.

1.15.5.1 Medication:

1. Abhal Juniperus communis Emmenogague, analgesic, anti-inflammatory

2. The cytotoxic, anti-inflammatory, antioxidant, and antibacterial properties of Badyan (Sounf) Foenicul vulgare Linn Habbe Balsan

3. anti-inflammatory, and antioxidant Aspand Peganum harmala Linn

4. Anti-depressant,

5. Indian rhubarb (Rewand chini) antioxidant, protective of the liver.

6. Tribulus terresteris of Kharkhask Aphrodisiac, diuretic, hypotensive Seven. Jadwar Delphidium denudatum Linn Hepatoprotective, antioxidant, and tonic

8. Anacyclus pyrethrum linn, Akarkarha Aphrodisiac, ejaculatory function restored, antioxidant, immunomodulator, and anti-diabetic PCOD and diet

Effective weight loss is considered to be the most effective way of reestablishing natural ovulation/menstruation when PCOD is associated with obesity or overweight. In comparison to a macronutrient-balanced healthy diet, a lower GI diet plan, where a major portion of total carbs are obtained from fresh fruit, vegetables, and whole-grain resources, has led to more significant menstrual consistency. A diet should be light, filling, and simple to digest. Consumption of fibre foods, such as fresh fruit and green leafy vegetables. Avoid eating anything that will take a long time to digest, anything that is heavy, or anything that is spicy. Conclusion Even though there is no cure for PCOD, the right unani medical procedures and lifestyle adjustments can lessen the signs and symptoms and restore fertility.

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