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PCOD A LIFESTYLE DISORDER IMPACTING FERTILITY

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- **ABSTRACT:-**

Other names:- Hyperandrogenic anovulation (HA), Stein- Leventhal syndrome.

- **WHAT IS PCOD/PCOS?**

PCOD is a **POLYCYSTIC OVARY SYNDROME**.

PCOD/PCOS is a most common complex hormonal disorder which very less and now-a-days PCOD problem has become and common disorder because of sedentary lifestyle. Though researchers do not know the exact of cause, they suspect that the body's regulation of hormones, such as insulin & androgens (also called male hormones), may be responsible.

This disorder is found in 8-13% of women about one into from where the periods begin till menopause.

PCOD is imbalance between follicle-stimulating hormone (FSH) and luteinizing hormone (LH) where, FSH level is decreased and LH level is increased.

- **INTRODUCTION:-**

In PCOS, female body produces male hormones more than normal.

Two hormones found in excess that leads to androgen or male like properties in women during PCOS are insulin and LH.

Insulin hormone is responsible for controlling blood sugar levels in human body. When cells become resistant to insulin action is said to be insulin resistance.

Excess insulin production results more androgen production i.e. male hormones (generally in normal present in very less amount).

Also more amount of LH production, causes increased level of androgen.

No impact/action is showed on blood sugar levels, hence body produces more amount of insulin.

PCOD is a heterogenous condition which is related to the endocrine reproductive disorder of female.

It occurs because of a second gene modifying the action of a dominant gene i.e., oligogenic disorder.

Although the genetic etiology of PCOD is unknown, however a family history may be the reason and it is relatively common. As we know family history to PCOD is unclear.

Factors which are mainly implicated in PCOD (e.g. obesity) can be worsen by poor dietary, sedentary life styles and lack of physical activity, toxins may also play an important role.

It can be reduce by modifications such as weight loss and exercise.

- **Keywords:-** Menstrual cycle, medicines, treatment

➤ **NORMAL MENSTRUAL CYCLE:-**

The length of the menstrual cycle varies from woman to woman, but the average is to have a periods every 28 days.

Regular, cycles that are longer or shorter than this, from 21 days to 40 days are normal.

A. **Phase 1(MENSTRUATION PHASE):-**

- i. Is a phase where the thick lining on the uterus is eliminated out through the vagina when there is no pregnancy.
- ii. Low estrogen and progesterone levels.
- iii. Loss of energy, mood swings.

B. **Phase 2 (FOLLICULAR PHASE):-**

(ESTROGEN HORMONE)

- i. It starts with the first day of menstrual cycle.
- ii. Hypothalamus signals the pituitary gland to release the Follicle stimulating hormone.
- iii. It stimulates the ovaries to create follicles. Each follicle contain immature eggs.
- iv. As follicle mature, estrogen rises and reaches its peak.
- v. Hunger is at the lowest. Better insulin sensitivity.
- vi. Better training performance.
- vii. No water retention elevator mode.

C. **Phase 3(OVULATION PHASE):-**

(LUTEINIZING HORMONE)

- i. Rising estrogen signals the pituitary gland to release luteinizing hormone.
- ii. Released by pituitary glands.
- iii. Luteinizing hormones prepares for the releasing of the mature egg from the ovary into the uterus through the fallopian tube.

D. **Phase (LUTEAL PHASE):-**

(PROGESTERONE HORMONE)

- i. Remaining follicle forms a cyst like structure called corpus luteum. It leads to release of progesterone.
- ii. This helps in thickening of the uterine wall to carry the egg.
- iii. Water retention increases, body temperature increases.
- iv. Insulin sensitivity reduces.

● **CAUSE OF PCOS/PCOD:-**

1. Sedentary lifestyle
2. Improper diet
3. No exercise
4. Sleeping pattern
5. Genetics hormones

● **5 REASONS OF PCOS/PCOD:-**

1. Hyper Androgenism
2. Menstrual Abnormalities
3. Polycystic (i.e. Many cysts in the ovary)
4. Decrease fertility
5. Chronic Anovulation

- **SYMPTOMS:-**

- In women with PCOS/PCOD, two hormones are mainly responsible -i) Insulin
ii) Androgen (male-type hormones)
- They are produced in higher levels.
- 1) Irregular periods
- 2) Hair growth on face, stomach and back.
- 3) Loss or thinning of scalp hair.
- 4) Acne (pimples)
- 5) Weight gain
- 6) Emotional problems (anxiety, depression)
- 7) Difficulties getting pregnant
- 8) Increased risk of type 2 diabetes

- **DIAGNOSIS:-**

There is no definite test of PCOS. Your doctor would likely discuss about the medical history. The medical history will include your menstrual periods, your weight changes and physical examination like excess hair growth, acne, insulin resistance, discolored skin.

- 1) Medical history, blood tests,
- 2) Ultrasound (sonography)
- 3) Periods less regular

The doctor might recommend-

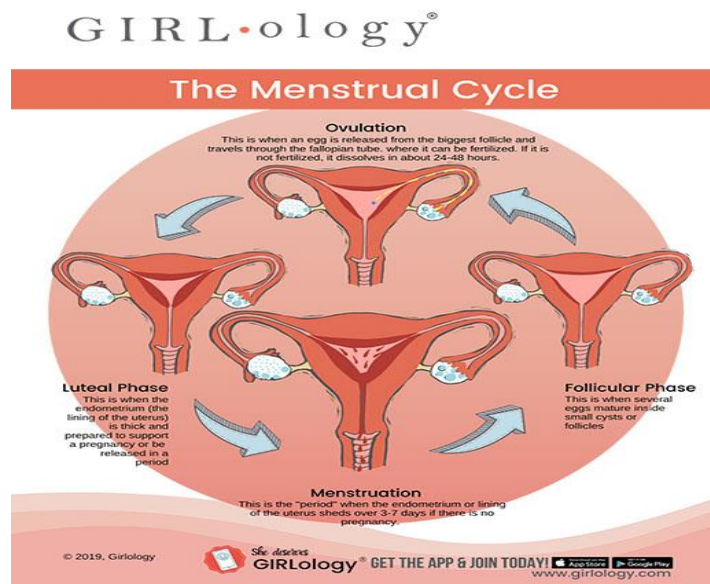
- a. A pelvic examination:-

Doctor manually and visually inspect the abnormalities and the reproductive organs.

- b. Blood tests:-

➤ Blood test is done to check hormone levels. This may include tests like fasting cholesterol, triglyceride level and glucose tolerance(to check diabetes).

- i. Follicle stimulating hormone(FSH):- Lower than normal of having PCOS (responsible for getting pregnant).
- ii. Luteinizing hormone(LH):- Responsible for ovulation. It may be higher than normal.



- iii. Estrogen :- These are group of hormones responsible for getting periods. Estrogen level may be normal or high if having PCOS.
- iv. Glucose level/tolerance to check diabetes:- Insulin is used to control blood sugar level. If body does not respond to insulin it means you have insulin resistance.

c. An ultrasound (Sonography):-

- Doctor checks the appearance of ovaries and thickens lining of the uterus, fallopian tube, rectum, cervix. A wandlike device is introduced into vagina and sound wave is emitted into it which are translated into images on a computer screen.
- They will also check for cysts in ovaries. The lining may be thicker than normal if having PCOS problem.
- Ovaries may be 1^{1/2} to 3 times larger than normal.

• **TREATMENT:-**

To treat PCOS, you doctor might recommend below-

1. **Combination birth control pills-**

Combination of estrogen and progesterone clearance production of androgen and regulate estrogen.

By regulating hormone level it may lower risk of endometrial cancer and it may regular your periods, also lower hair growth and acne.

2. **Progestin therapy-**

By using progestin therapy for 10 to 14 days every 1 to 2 months can regulate your periods. It may also protect from endometrial cancer.

3. **Medications like Allopathy-**

- i. Metformin- Metformin is used for type 2 diabetes. It is used for lowering insulin level in our body.
- ii. Letrozole- It is used for cancer treatment. It can help to stimulate ovaries.
- iii. Spironolactone- Spironolactone blocks the androgen effect on skin. It may includes excessive hair growth and acne. Spironolactone can cause defects in birth so effective birth control medication must be taken.

• **NEW TREATMENTS FOR PCOS:-**

- Glucagon like peptide-1 receptor analogs (GCP-1RA) :-

- i. It is used for the treatment of obese women with PCOS.
- ii. It is used to reduce body weight increase in menstruation frequency.

- Sodium glucose co-transporter 2 inhibitors (SGLT-2):-

- i. It is a new class of anti-diabetic agents.
- ii. It is beneficial for cardiovascular, reduce body weight, lower insulin level.
- iii. Although SGLT-2 inhibitor are NOT YET APPROVED for the treatment of PCOS as it is beneficial glycaemic.

• **NATURAL TREATMENT:-**

1) **Weight loss:-**

- Maintaining health is an important part of controlling PCOD/PCOD.
- Overweight can worsen PCOD symptoms.

2) **Diet changes:-**

- Eating balanced diet can help with PCOD.
- People with PCOD tend to have higher levels of insulin, it may help stop responding to the hormone as will.

3) Exercise:-

- It is an important component of weight loss.
- Regular exercise can help to tower insulin levels.

4) Supplements:-

- Some people use nutritional supplement to control PCOD.
- It is necessary to concern with a doctor before taking any nutritional supplement, because it may interfere with other medications.
- It are used to regulate hormone insulin resistance and inflammation associated with PCOS.
- Supplements are NOT REGUALATED BY U.S. FDA. Firstly, discuss about the supplement with your doctor and take advice of them. Because of some of them supplements may interact with PCOS treatment.

i. Inositol-

- It is a vitamin B.
- It is used to help to improve insulin resistance.
- It is also been found to help with fertility in many of the cases of PCOS.

ii. Cinnamon –

- Cinnamon is extract from the bark of cinnamon.
- Its extraction has been shown a positive effect on insulin resistance.
- It may also used to regulate menstruation for woman with PCOS.

iii. Turmeric-

- Curcumin is active ingredient in the turmeric.
- The biological name of *Curcumin longa*.
- Turmeric may decrease insulin resistance.
- It is also used as anti-inflammatory agent.

iv. Liquoriceroot-

- Liquorice root contains glycyrrhizin as an active ingredient which helps as anti- inflammatory agent.
- It works to metabolize sugar.

v. Ashwangandha-

- Ashwangandhais also called as Indian Ginseng.
- It is help to balance cortisol and which could improve stress and improve symptoms of PCOS.

INFERTILITY

Infertility has become and global health issue which are affecting millions of people of reproductive age worldwide. Available data suggests that between 48 million couples and 186 million individuals have infertility globally. Infertility is a disease of male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse. WHO's International Classification of Diseases provides more information on the many primary and secondary causes of infertility in both women and men. Primary infertility is the inability to have any pregnancy, while secondary infertility is the inability to have a pregnancy after previously successful conception.

The factors behind infertility includes male factors, female factors, a combination of male or female factors or may be unexplained. It may also include environmental factors and lifestyle such as smoking, excessive alcohol intake, obesity and exposure to environmental pollutants have been associated with the lower fertility rates.

- General factors-

Diabetes mellitus, thyroid disorders, undiagnosed and untreated coeliac disease, adrenal disease.

- Environmental factors-

Toxins such as glues, volatile organic solvents or silicones, physical agents, chemical dusts, and pesticides. Tobacco smokers are 60% more likely to be infertile than non-smokers.

Many more couples, however, experience involuntary childlessness for at least one year: estimates range from 12% to 28%. The main cause of infertility in humans is the age, in addition the effect of an advanced maternal age can rise the probability of suffering a spontaneous abortion during pregnancy.

- **World Health Organization**

The World Health Organization defines infertility as follows-

Infertility is "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (and there is no other reason, such as breastfeeding or postpartum amenorrhoea). Primary infertility is infertility in a couple who have never had a child. Secondary infertility is failure to conceive following a previous pregnancy. Infertility may be caused by infection in the man or woman, but often there is no obvious underlying cause".

- **CAUSES-**

- **Iodine Deficiency-**

Iodine deficiency may lead to infertility.

- **Delayed puberty-**

Delayed puberty, puberty absent past or occurring later than the average onset (between the ages of ten and fourteen), may be a cause of infertility. In the United States, girls are considered to have delayed puberty if they have not started menstruating by age 16 (alongside lacking breast development by age 13). Boys are considered to have delayed puberty if they lack enlargement of the testicles by age 14. Delayed puberty affects about 2% of adolescents.

- **Natural infertility-**

Before puberty, humans are naturally infertile; their gonads have not yet developed the gametes required to reproduce: boys' testicles have not developed the sperm cells required to impregnate a female; girls have not begun the process of ovulation which activates the fertility of their egg cells (ovulation is confirmed by the first menstrual cycle, known as menarche, which signals the biological possibility of pregnancy).

- **Sexually transmitted infections-**

Infections with the following sexually transmitted pathogens have a negative effect on fertility: Chlamydia trachomatis and Neisseria gonorrhoeae. There is a consistent association of Mycoplasma genitalium infection and female reproductive tract syndromes. M. genitalium infection is associated with increased risk of infertility.

Other causes-

Factors that can cause male as well as female infertility are:

- **DNA damage-**

DNA damage reduces fertility in female oocytes, as caused by smoking, other xenobiotic DNA damaging agents (such as radiation or chemotherapy) or accumulation of the oxidative DNA damage 8-hydroxy-deoxyguanosine.

DNA damage reduces fertility in male sperm, as caused by oxidative DNA damage, smoking, other xenobiotic DNA damaging agents (such as drugs or chemotherapy) or other DNA damaging agents including reactive oxygen species, fever or high testicular temperature.

- Common causes of infertility of females include:

- 1)Ovulation problems (e.g. PCOS, the leading reason why women present to fertility clinics due to anovulatory infertility.
- 2)Tubal blockage.
- 3)Pelvic inflammatory disease caused by infections like tuberculosis.
- 4)Age-related factors.
- 5)Uterine problems.
- 6)Previous tubal ligation.
- 7)Endometriosis.
- 8)Advanced maternal age.
- 9)Immune infertility.

- **DIAGNOSIS-**

- Fertility testing-

If both partners are young and healthy and have been trying to conceive for one year without success, a visit to a physician or women's health nurse practitioner (WHNP) could help to highlight potential medical problems earlier rather than later. The doctor or WHNP may also be able to suggest lifestyle changes to increase the chances of conceiving.

Women over the age of 35 should see their physician or WHNP after six months as fertility tests can take some time to complete, and age may affect the treatment options that are open in that case.

A doctor or WHNP takes a medical history and gives a physical examination. They can also carry out some basic tests on both partners to see if there is an identifiable reason for not having achieved a pregnancy. If necessary, they refer patients to a fertility clinic or local hospital for more specialized tests. The results of these tests help determine the best fertility treatment.

- Imaging testing-

A pelvic ultrasound looks for uterine or fallopian tube disease. Sometimes a sonohysterogram, also called a saline infusion sonogram, or a hysteroscopy is used to see details inside the uterus that can't be seen on a regular ultrasound.

- Other hormone testing-

Other hormone tests check levels of ovulatory hormones as well as thyroid and pituitary hormones that control reproductive processes.

Depending on your situation, rarely your testing might include:

- Genetic testing-

Genetic testing helps determine whether there any changes to your genes that may be causing infertility.

- Laparoscopy-

This minimally invasive surgery involves making a small incision beneath your navel and inserting a thin viewing device to examine your fallopian tubes, ovaries and uterus. A laparoscopy can identify endometriosis, scarring, blockages or irregularities of the fallopian tubes, and problems with the ovaries and uterus.

• **TREATMENT-**

Treatment depends on the cause of infertility, but may include counselling, fertility treatments, which include in vitro fertilization. According to ESHRE recommendations, couples with an estimated live birth rate of 40% or higher per year are encouraged to continue aiming for a spontaneous pregnancy. Treatment methods for infertility may be grouped as medical or complementary and alternative treatments. Some methods may be used in concert with other methods. Drugs used for both women and men include clomiphene citrate, human menopausal gonadotropin (hMG), follicle-stimulating hormone (FSH), human chorionic gonadotropin (hCG), gonadotropin-releasing hormone (GnRH) analogues, aromatase inhibitors, and metformin.

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