

A REVIEW ON POLY CYSTIC OVARIAN DISORDER AND TREATMENT OF INFERTILITY IN WOMEN

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Abstract –

-Polycystic ovary syndrome is a complex disorder for which multiple treatment approaches are required, depending on the reason a patient seeks treatment. Its deal with pregnancy with pcos and how to cure, commonly treatment and medication which are used for pcos, infertility will affect women pregnancy and cure how to give hormonal therapy and alternative remedies for pcos like diet excessive, insulin resistance, pills or surgical , Clomiphene has shown the best results in treating infertility, whereas data are limited regarding the pharmacological treatment of androgenic symptoms. Long-term consequences of PCOS, which include type-2 diabetes and cardiovascular disease, can be treated with antidiabetic drugs and statins. Pcos inflammable to tissue and pathophysiology of pcos

Key words-

Pcos, hormonal level, treatment, pcos in pregnancy, alternative remedies, pathophysiology of pcos

INTRODUCTION

Polycystic ovary syndrome (PCOD) is a condition that affects a woman's hormone levels. Women with PCOD produce higher-than-normal amounts of male hormones. This hormone imbalance causes their body to skip menstrual periods and makes it harder for them to get pregnant. Birth control pills and diabetes drugs (which combat insulin resistance, a PCOD symptom) can help fix the hormone imbalance and improve symptoms. Read on for a look at the possible causes of PCOD and its possible effects on a woman's body

Polycystic ovarian condition (PCOD) is a heterogeneous endocrine problem recognized by the appearance of ovarian pimples, anovulation, and endocrine variety that seriously sway the existence of a lady. PCOD also causes hair growth on the face and body, and baldness. And it can contribute to long-term health problems like diabetes and heart disease The unsettling influence in the regenerative chemicals like LH, FSH, estrogen, testosterone interferes with the ordinary feminine cycle and would prompt oligomenorrhoea, amenorrhoea like anomalies.

PCOS is a problem with hormones that affects women during their childbearing years (ages 15 to 44). Between 2.2 and 26.7 percent of women in this age group have PCOS (Bharathi et al., 2017). Many women have PCOS but don't know it. In one study, up to 70 percent of women with PCOS hadn't been diagnosed.

PCOS is determined to have hyperandrogenism, feminine abnormalities, and fluctuating size of pimples in ovaries, albeit significant contrasts exist between people. This multifactorial condition at first creates in young people who are at high gamble for the development of a few comorbidities including stoutness, type II diabetes, fruitlessness, endometrial dysplasia, cardiovascular problems, and maniacal issues (El Hayek et al., 2016, Goodarzi et al., 2011).

Attributable to the multifaceted design of this condition, different arrangements of symptomatic rules have been started for the affirmation of PCOS which are recorded beneath in Fig. 1 (Lizneva et al., 2016, Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group 2004). Other than three demonstrative measures, Anti-Mullerian chemical (AMH) is additionally an obvious hormonal marker and significant in development and improvement of ovarian follicles in PCOS ladies (Broekmans et al., 2008). Over discharge of AMH obstruct the follicular advancement which results into ovarian glitch

PCOS affects a woman's ovaries, the reproductive organs that produce estrogen and progesterone — hormones that regulate the menstrual cycle. The ovaries also produce a small amount of male hormones called androgens. The ovaries release eggs to be fertilized by a man's sperm. The release of an egg each month is called ovulation.

Follicle-stimulating hormone (FSH) and luteinizing hormone (LH), which are produced in the pituitary gland, control ovulation.

FSH stimulates the ovary to produce a follicle — a sac that contains an egg — and then LH triggers the ovary to release a mature egg.

PCOS is a “syndrome,” or group of symptoms that affects the ovaries and ovulation. Its three main features are:

- cysts in the ovaries
- high levels of male hormones
- irregular or skipped periods

In PCOS, many small, fluid-filled sacs grow inside the ovaries. The word “polycystic” means “many cysts.”

These sacs are actually follicles, each one containing an immature egg. The eggs never mature enough to trigger ovulation.

The lack of ovulation alters levels of estrogen, progesterone, FSH, and LH. Progesterone levels are lower than usual, while androgen levels are higher than usual.

Extra male hormones disrupt the menstrual cycle, so women with PCOS get fewer periods than usual.

Common symptoms of PCOS

Some women start seeing symptoms around the time of their first period. Others only discover they have PCOS after they've gained a lot of weight or they've had trouble getting pregnant.

The most common PCOS symptoms are:

- **Irregular periods.** A lack of ovulation prevents the uterine lining from shedding every month. Some women with PCOS get fewer than eight periods a year or none at all (10Trusted Source).
- **Heavy bleeding.** The uterine lining builds up for a longer period of time, so the periods you do get can be heavier than normal.
- **Hair growth.** More than 70 percent of women with this condition grow hair on their face and body — including on their back, belly, and chest (11). Excess hair growth is called hirsutism.
- **Acne.** Male hormones can make the skin oilier than usual and cause breakouts on areas like the face, chest, and upper back.
- **Weight gain.** Up to 80 percent of women with PCOS are overweight or have obesity (11).

- **Male pattern baldness.** Hair on the scalp gets thinner and may fall out.
- **Darkening of the skin.** Dark patches of skin can form in body creases like those on the neck, in the groin, and under the breasts.
- **Headaches.** Hormone changes can trigger headaches in some women.
- Having higher-than-normal androgen levels can affect your fertility and other aspects of your health.
- To get pregnant, you have to ovulate. Women who don't ovulate regularly don't release as many eggs to be fertilized. PCOS is one of the leading causes of infertility in women (12).

Up to 80 percent of women with PCOS are overweight or have obesity (13Trusted Source). Both obesity and PCOS increase your risk for:

- high blood sugar
- high blood pressure
- low HDL “good” cholesterol
- high LDL “bad” cholesterol

Together, these factors are called metabolic syndrome, and they increase the risk for:

- heart disease
- diabetes
- stroke

Sleep apnea

This condition causes repeated pauses in breathing during the night, which interrupt sleep.

Sleep apnea is more common in women who are overweight — especially if they also have PCOS. The risk for sleep apnea is 5 to 10 times higher in women who have both obesity and PCOS than in those without PCOS (14).

Endometrial cancer

During ovulation, the uterine lining sheds. If you don't ovulate every month, the lining can build up. A thickened uterine lining can increase your risk for endometrial cancer (15).

Depression

Both hormonal changes and symptoms like unwanted hair growth can negatively affect your emotions. Many with PCOS eventually experience depression and anxiety

Doctors typically diagnose PCOS in women who have at least two of these three symptoms (17Trusted Source):

- high androgen levels
- irregular menstrual cycles
- cysts in the ovaries

Your doctor should also ask whether you've had symptoms like acne, face and body hair growth, and weight gain.

A pelvic exam can look for any problems with your ovaries or other parts of your reproductive tract. During this test, your doctor inserts gloved fingers into your vagina and checks for any growths in your ovaries or uterus.

Blood tests check for higher-than-normal levels of male hormones.

You might also have blood tests to check your cholesterol, insulin, and triglyceride levels to evaluate your risk for related conditions like heart disease and diabetes.

An ultrasound uses sound waves to look for abnormal follicles and other problems with your ovaries and uterus.

Pregnancy and PCOS

PCOS interrupts the normal menstrual cycle and makes it harder to get pregnant. Between 70 and 80 percent of women with PCOS have fertility problems (18Trusted Source).

This condition can also increase the risk for pregnancy complications.

Women with PCOS are twice as likely as women without the condition to deliver their baby prematurely. They're also at greater risk for miscarriage, high blood pressure, and gestational diabetes (19).

However, women with PCOS can get pregnant using fertility treatments that improve ovulation. Losing weight and lowering blood sugar levels can improve your chances of having a healthy pregnancy.

Common medical treatments

Birth control pills and other medications can help regulate the menstrual cycle and treat PCOS symptoms like hair growth and acne.

Birth control

Taking progestin daily can:

- restore a normal hormone balance
- regulate ovulation
- relieve symptoms like excess hair growth
- protect against endometrial cancer

These hormones come in a pill, patch, or vaginal ring.

Metformin

Metformin (Glucophage, Fortamet) is a drug used to treat type 2 diabetes. It also treats PCOS by improving insulin levels. One study found that taking metformin while making changes to diet and exercise improves weight loss, lowers blood sugar, and restores a normal menstrual cycle better than changes to diet and exercise alone (25).

Clomiphene

Clomiphene (Clomid) is a fertility drug that can help women with PCOS get pregnant.

It's important to note that, as you're discussing family planning, to keep in mind that clomiphene increases the chances for twins and other multiple births (26).

Hair removal medications

A few treatments can help get rid of unwanted hair or stop it from growing.

Eflornithine (Vaniqa) cream is a prescription drug that slows hair growth. Laser hair removal and electrolysis can get rid of unwanted hair on your face and body.

Surgery

Surgery can be an option to improve fertility if other treatments don't work. Ovarian drilling is a procedure that makes tiny holes in the ovary with a laser or thin heated needle to restore normal ovulation.

Oral contraceptives

Oral contraceptives (birth control pills) are sometimes used to treat hormonal acne. However, not just any birth control pill will do.

Combination pills are the only birth control pills that will help stabilize your hormone levels throughout your entire menstrual cycle.

They usually contain a mix of ethinyl estradiol and one or more of the following:

- progestin norgestimate
- drospirenone
- norethindrone acetate

Birth control pills aren't for everyone, though. You shouldn't use the pill if you're over age 35 or have a history of:

- breast cancer
- blood clots
- high blood pressure (hypertension)
- smoking

Anti-androgen drugs

Anti-androgen drugs are prescription medications that decrease testosterone levels.

Although androgens are classified as "male" hormones, women have naturally occurring androgens too. The difference is that women have lower amounts. Sometimes PCOS and other hormonal conditions can create too much testosterone in the body. This can increase sebum and skin cell production, leading to acne. Not everyone with hormonal acne has high androgen levels, so your doctor will likely draw a blood sample to test your levels.

Retinoids

OTC retinoids are traditionally used to fill in the appearance of wrinkles and help with uneven skin tone. Some formulas are also used for acne, but these are most often geared toward teens.

If you have PCOS-related acne, skip the OTC retinoids and see your dermatologist about prescription-strength options. They can be taken orally or applied as a topical cream or gel. The oral retinoid isotretinoin (Accutane) is the most popular option.

Retinoids make your skin extremely sensitive to the sun's UV rays, so it's important to apply sunscreen liberally throughout the day. If your skin is left unprotected, your risk for hyperpigmentation and even skin cancer will increase.

If you opt for topical retinoids, you should only apply them in the evening. Applying them during the day can increase your risk for sun-related side effects.

Topical retinoids may also be drying at first. You might need to start by using the gel or cream every other day and gradually working your way up to the recommended dosage.

How PCOS impacts fertility

People with PCOS have a hormonal imbalance that can lead to:

- high levels of hormones called androgens
- the formation of small, painless, fluid-filled sacs in the ovaries
- thickening of the outer shell of the ovaries
- high levels of insulin in your blood

These are all things that can interfere with ovulation. One sign that this is happening is irregular or missed periods.

The prevalence of infertility in people with PCOS is thought to be between 70 and 80 percent

Fertility treatments for women with PCOS

There's currently no cure for PCOS, so treatment and management depends on the goal.

For infertility caused by PCOS, treatment involves correcting any ovulation issues and tackling metabolic problems, such as insulin resistance.

Hormonal birth control pills can be helpful for those who don't wish to get pregnant. And there are treatments to help you ovulate and conceive. It can also be used to help regulate menstrual cycles and provide protection from endometriosis in women with irregular periods associated with PCOS.

Your doctor will probably recommend some basic health measures first.

Maintaining a healthy weight for your body can help regulate menstruation and keep blood glucose levels under control. So a healthy, balanced diet and regular exercise are vital.

If you don't already, it's a good time to start tracking your periods. There are many calendars and fertility apps designed to help you figure out which days you're most likely ovulating.

Clomiphene citrate (Clomid)

Clomiphene citrate is an ovulatory stimulant. It works by blocking estrogen feedback to the brain.

This oral medication is taken once a day for 5 days at the beginning of your menstrual cycle. You'll start with the lowest possible dose. Your doctor can increase it as needed.

Clomiphene citrate (Clomid) is quite effective in helping women with PCOS to ovulate. However, about 15 percent of women with PCOS don't respond to the maximum dose.

Letrozole

Letrozole (Femara) is an aromatase inhibitor. It's used to treat breast cancer and for jump-starting ovulation in people with PCOS.

This medication blocks estrogen production and increases the release of follicle-stimulating hormone (FSH) to stimulate ovulation.

Metformin

Metformin is used to treat type 2 diabetes. It boosts the body's ability to effectively use insulin.

This isn't a first-line treatment for PCOS, but can be used to encourage regular periods and ovulation. Metformin is not usually recommended for women with PCOS who have difficulty becoming pregnant, because it's not as effective as letrozole and clomiphene. But, it can encourage ovulation, so women taking metformin who do not want to become pregnant should use birth control, as they may start ovulating.

Gonadotropins

Gonadotropins are injectable hormones that can help you ovulate. This treatment may require frequent doctor's visits to see how your body is responding.

Surgery

If you haven't responded to medication, a type of surgery called laparoscopic ovarian drilling may be an option, though this is rarely done in practice.

PCOS can thicken the outer shell of the ovaries and block ovulation. In this procedure, the surgeon will make several tiny incisions. Through one incision, a laparoscope will be used to view your internal organs. Then, a laser or fine needle will be inserted to make a few holes on the surface of the ovary. This generally restores ovulation for 6 to 8 months. It's usually performed under general anesthesia as an outpatient procedure. Results aren't permanent.

Alternative remedies

Diet and exercise

A healthy diet is important to overall health for anyone. But a low calorie, low carb diet that provides all essential nutrients is said to significantly improve Trusted Source insulin sensitivity and fertility in people with PCOS.

Aiming for at least 30 minutes of moderate exercise 3 times per week is also beneficial.

If your BMI is high, symptoms of PCOS can be improved by losing excess weight. It's also helpful to speak with a dietitian or nutritionist, who can provide input on healthy eating and offer motivation.

what type of PCOS do I have?

In order to effectively treat PCOS and reverse symptoms naturally, you need to know the type of PCOS you're dealing with. The 4 types of PCOS include:

Insulin resistant PCOS

This is the most common type of PCOS, affecting around 70% of people. Insulin resistance is basically where there are higher levels of insulin than normal in the body - also known as hyperinsulinemia. This happens when our cells become a bit "numb" to the effects of insulin, which causes the pancreas to pump out more and more insulin until the cells get the message. In this type of PCOS, you may be struggling with your weight, holding weight around the stomach/abdomen, have sugar cravings as well as symptoms like fatigue or brain fog. It's high levels of insulin that drives up androgen levels which cause issues like excess hair, male pattern hair loss and acne.

Often doctors will just test HbA1c or glucose levels, which while gives us some information about

your blood sugar levels, doesn't give us the full picture. To rule out insulin resistance, you NEED to have your fasting insulin tested. Normal fasting insulin levels are less than 10 mIU/L (60 pmol/L).

To help treat insulin resistant PCOS, the key is down to improving your insulin sensitivity. You can work on this through:

Regular exercise and movement throughout the day helps your body to burn sugar, build muscle and improve your sensitivity to insulin.

Avoiding high sugar foods and having a lower carbohydrate diet that is also rich in protein and fat to balance blood sugar levels.

Prioritising sleep and reducing stress can also help to manage blood sugar and insulin levels.

Supplementation of key nutrients such as magnesium, chromium, NAC, inositol and berberine can also be extremely helpful. I strongly advise working with a nutritionist or naturopath to find out what is best for you at what dosage, as this will vary from person to person and is key to getting results.

Post-pill PCOS

Post-pill PCOS occurs in some people after they stop taking the oral contraceptive pill. In this type, symptoms like acne, irregular periods and excess hair growth were not present prior to starting the pill at all. Oral contraceptives such as Ginnet, Yasmin and Yaz are often involved in this type of PCOS due to the type of synthetic progestins used. After coming off the pill, your ovaries basically throw a party and there is a natural surge in androgens which can cause typical PCOS symptoms, however in this type there is no insulin resistance. I typically see this in clients in 3-6 months after stopping the pill. Keep in mind that this type can take time to heal on its own, but can be addressed more quickly with the right nutrition, lifestyle changes and supplementation or herbal medicine support.

To help treat post-pill PCOS:

Be patient. This type can take some time to reverse, but remember it is a temporary situation.

Speak to a practitioner about supplementation. Nutrients such as magnesium, vitamin E, vitamin B6, zinc as well as specific herbs like chaste tree and peony can be helpful to support ovulation and lower excess androgens.

Prioritise sleep and stress management. Like insulin resistance PCOS, it is important to get a good quality sleep and reduce stress levels to support overall hormonal balance.

Adrenal PCOS

This type of PCOS is due to an abnormal stress response and affects around 10% of those diagnosed. Typically DHEA-S (another type of androgen from the adrenal glands) will be elevated alone, and

high levels of testosterone and androstenedione are not seen. This type of androgen unfortunately isn't often tested, unless you go through an endocrinologist or other specialist.

To help treat adrenal PCOS:

Manage stress. Reducing stress levels through activities like yoga, meditation, mindfulness and journaling will help to support your nervous system and your hormones.

Get enough sleep each night. Make sure you're getting at least 8 hours of sleep each night to support your stress levels and recovery.

Avoid high intensity exercise. Limit excessive and high intensity training as this can further put a stress on your adrenals.

Avoid caffeine from coffee, tea and fizzy drinks.

Speak to a practitioner about herbs and supplements. Specific herbs like withania, rhodiola and liquorice can help the body adapt and recover from stress. Nutrients like magnesium, vitamin B5 and vitamin C are also important to support the adrenal glands and nervous system. You'll need to speak to a professional about correct dosages and which supplements to take, especially when it comes to herbs as they may not be right for you.

Inflammatory PCOS

In inflammatory PCOS, chronic inflammation causes the ovaries to make excess testosterone, resulting in physical symptoms and issues with ovulation. Signs of inflammation in this type of PCOS include headaches, joint pain, unexplained fatigue, skin issues like eczema and bowel issues like IBS. Typically, you will see raised inflammatory markers on a blood test, such as a high CRP (C reactive protein) above 5. Other tests such as fasting glucose and insulin are in the normal range, but can sometimes be affected as inflammation can affect these numbers.

To help treat inflammatory PCOS:

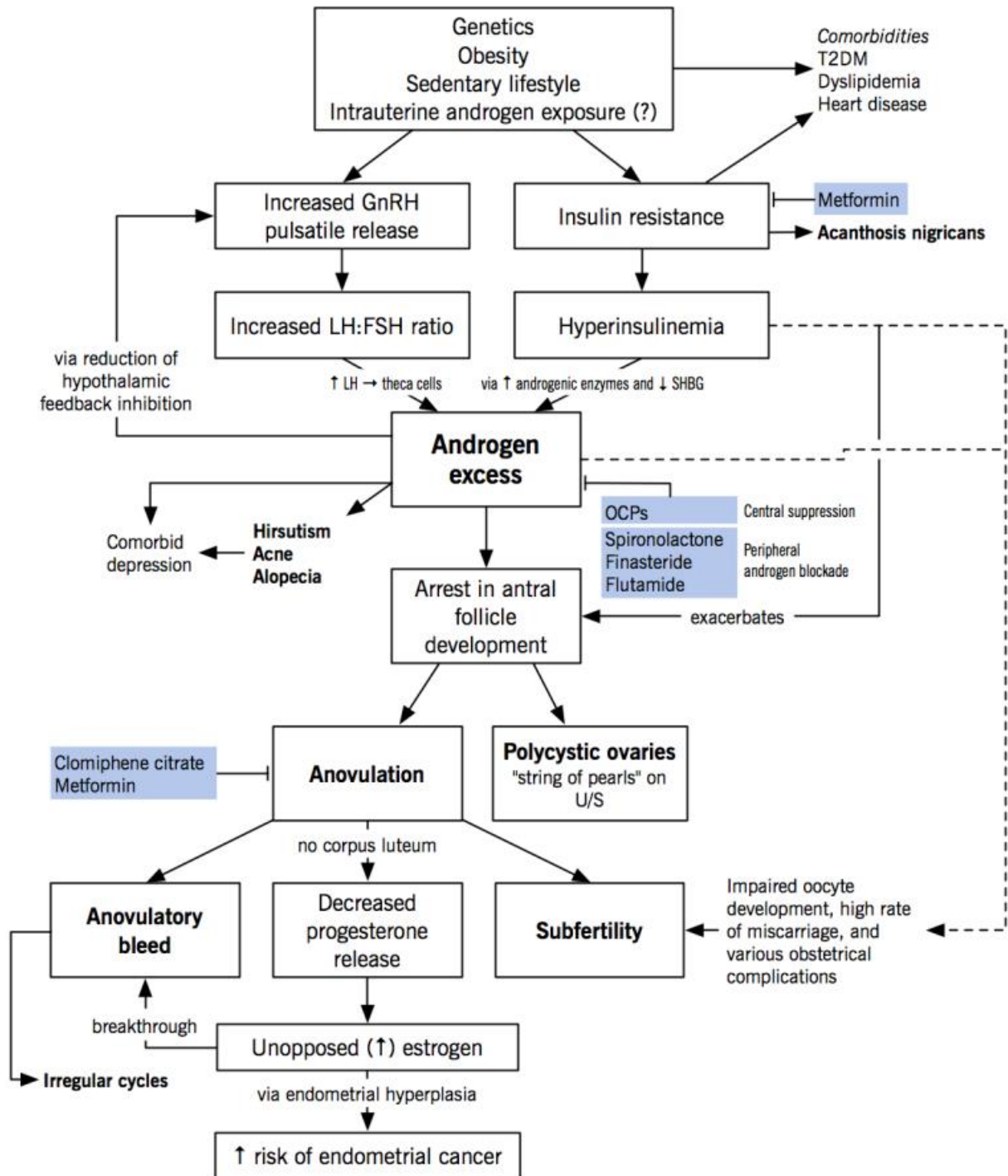
Address gut health. Repairing leaky gut tissue, balancing gut bacteria, improving digestive enzymes and eliminating pathogenic bacteria are all important steps to reduce overall inflammation.

Remove food triggers. Addressing potential food sensitivities and removal of inflammatory foods is a vital step to help address inflammation. It can sometimes be quite difficult to figure out what foods might be driving your inflammation, so it's best to work with a nutritionist on this who can help you.

Natural anti-inflammatories such as turmeric, omega 3 fatty acids as well as antioxidants like NAC can help to support this type of PCOS. Always speak to a practitioner first to see if these are right for you, and in what dosages to take them for them to be effective.

Pathophysiology of PCOS

Alex Rotstein, Ragini Srinivasan, and Eric Wong



he pathophysiology of PCOS Hypersecretion of androgens by the stromal theca cells of the polycystic ovary leads not only to the cardinal clinical manifestation of the syndrome, hyperandrogenism, but is also one of the mechanisms whereby follicular growth is inhibited with the resultant excess of immature follicles. Hypersecretion of luteinizing hormone (LH) by the pituitary – a result both of disordered ovarian-pituitary feedback and exaggerated pulses of GnRH from the hypothalamus – stimulates testosterone secretion by the ovary. Furthermore, insulin is a potent stimulus for androgen secretion by the ovary which, by way of a different receptor for insulin, does not exhibit insulin resistance. Insulin therefore amplifies the effect of LH, and additionally magnifies the degree of hyperandrogenism by suppressing liver production of the main carrier protein sex hormone binding globulin (SHBG), thus elevating the ‘free androgen index’. It is a combination of genetic abnormalities. combined with environmental factors, such as nutrition and body weight, which then affect expression of the syndrome.

Conclusion -Polycystic ovary syndrome is a complex disorder for which multiple treatment approaches are required, depending on the reason a patient seeks treatment. Clomiphene has shown the best results in treating infertility, whereas data are limited regarding the pharmacological treatment of androgenic symptoms. Long-term consequences of PCOS, which include type-2 diabetes and cardiovascular disease, can be treated with antidiabetic drugs and statins.