EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 6
Issue: 4
195-198
Year: 2019

A REVIEW ON POLYCYSTIC OVARY SYNDROME (PCOS): THE MOST COMMON ENDOCRINE DISORDER PREVAILING IN WOMEN

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Article Received on 30/01/2019 **Article Revised on 20/02/2019** **Article Accepted on 14/03/2019**

ABSTRACT
The present review article basically focuses on the most common endocrine disorder in women, Polycystic ovary syndrome (PCOS). It covers the import aspects regarding PCOS, its etiology, symptoms, medications prevailing in the world. By the knowledge of the PCOS till now, we can refer it as a condition having numerous disorders in combination. And all these are needed to be attended simultaneously. The only way to prevent the PCOS in women is to eat healthy and avoid obesity.

KEYWORDS: The present review article avoid obesity.

INTRODUCTION

Polycystic ovary syndrome (PCOS), a most common endocrine disorder prevailing in women, mostly infertile women is 15-20%. It is etiology is still not clear, however studies till now suggests that it may be a X-linked dominant condition. There is basically the abnormalities in the metabolism of estrogens and androgens in PCOS. Also, there are abnormalities in the production of androgens. These patients mainly have very high concentrations of androgenic hormones such as, androstendione, testosterone, dehydroepiandrosterone sulphate (DHEAS), however every individual is different and may vary accordingly. PCOS is mostly in obese patients, which increases the abnormalities of peripheral insulin resistance and hyperinsulinemia.[1] Anovulation in PCOS women is due to amplified stimulation of Luteinizing hormone (LH) I anterior pituitary, that thus stimulate increase in ovarian theca cells, which thus increase the production of androgens. As LH increase there is decrease in the level of Follicle stimulating hormone (FSH). This cause no aromatization of the androgens to estrogens in ovarian granulose cells. Thus, decrease in estrogen level and therefore, cause anovulation.[2]

PCOS is observed in women of child-bearing age irrespective to cultures and ethnicities, varying from 5-10%.[3] Only in Indian adolescents it is reported to be 9.13%.[4] The prevailing signs and symptoms of PCOS are irregular or anovulatory cycles with additional signs of hyperandrogenism and polycystic ovaries. The hyperandrogenism includes acne, seborrhea, hiirsutism, alopecia, and frank virilization. The Polycystic ovaries can be found using pelvic sonography. It is mostly associated with obesity, insulin resistance (IR) and a high risk to develop Type 2 diabetes mellitus (T2DM).[5] These all abnormalities may cause infertility and endometrial cancer in women with PCOS. Thus, early diagnosis and pertinent treatment is very much needed.

Review: The proper understanding of the normal ovulation cycle is very much needed to understand the PCOS and anovulation. The hypothalamus helps inn seccretion of Gonadotropin releasing hormone (GnRH), which acts on the anterior pituitary to secrete two very important hormones, that is the Follicle stimulating hormone (FSH) and the Leutinising hormone (LH). These both hormones target the follicles of the ovary in the outer cortex at various developmental stages. The inner lining of the ovarian follicles persists both granulose cells and theca cells. The FSH receptors are present in the granulosa cells. In the presence of FSH, the follicles get initiated. Now, only one follicle will get matured to be a dominant or graffian follicle. Also, FSH is important for induction of aromatase activity in the granulosa cells. The receptors for LH are present in the theca cells of all follicles and on the granulose cells of large pre-ovulatory follicles. This LH will be further responsible for ovulation process. Furthermore, LH also helps in production of androgen by theca cells.[6]

Etiopathogenesis: The exact cause of PCOS is not known and is referred as a multi-factorial disease. Most commonly the animal models are used to know the cause of PCOS, which include mice, rhesus monkeys, ewes, sheep, rodents, etc. The most commonly used one is rodents.[7-8] The have provided some evidence that the intra-uterine fetal exposure to androgen excess mainly

cause the development of PCOS.[8]Various researches have been performed by Legro and colleagues, diagnosing PCOS in 80 sibling patients. There was condition of hyperandrogenemia in 46% women and also, increase in the level of DHEAS in the men in the family.[9] Both, the father and mother of the women patients had obesity and metabolic syndrome.[10]

Some Treatment regimen includes

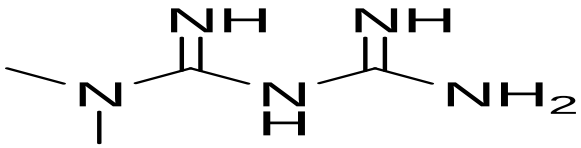
- **Treatment of Insulin sensitivity:** The best approach to manage PCOS includes good life style and medications to reduce insulin secretion and stabilize glucose tolerance.

1. Modification in lifestyle of patient

The best method to improve insulin sensitivity in women with PCOS is weight loss, diet control and regular exercise. It is considered to be first choice in women with PCOS and infertility. Hypo-caloric diet and exercise results in appropriate weight loss in women. Exercise alone has evidenced weight loss in may PCOS women, depending on the degree on obesity.[11]

2. Medication- Biguanide

Metformin **(1)** helps in lowering the serum androgens, which thus helps in improving the ovulation and menstruation.[12,13] It also helps in the weight loss in PCOS patients or women and its dosage usually range from 1500-2000 mg/day I divided doses. A small risk involves lactic acidosis I women having diabetes and impaired renal function. Some other risk factors involve Vitamin B12 deficiency[14], hepatotoxicity[15], and Peripheral neuropathy.[16]



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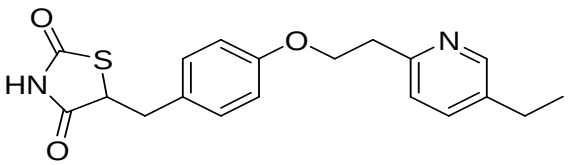
3. Medication- Thiazolidinediones

They include Pioglitazone **(2)** and rosiglitazone **(3)**, which decrease in circulating androgen levels, improvement in ovulation rate, and improvement in glucose tolerance.[17-20]



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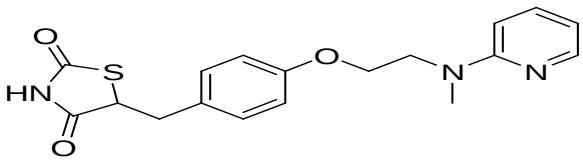

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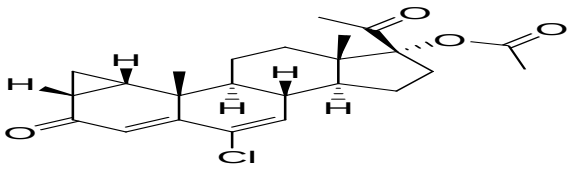
- **Treatment of Oligomenorrhea:** Combination of various oral contraceptives: Oligomenorrhea refers to impaired menstruation. Oral contraceptives helps in PCOS by a various mechanisms, like decrease in pituitary LH secretion, decrease in ovarian androgen secretion, etc. Most of the oral contraceptives contain combination of estrogen and anti-androgens (including cyproterone acetate, drosperinone, levonorgestril, norgestimate and desogestril) All contraceptives have side effects, so no one can be called best for women. Thus, very low dose is preferred by physicians.[21]

- **Treatment of Hirsuitism:** The number of studies suggested the improved hirsuitism (unwanted growth of hairs on face, back and chest) in PCOS with the use of oral contraceptives, but no evidence has been found till now.[22]

1. Spironolactone: Even though with weak evidence, it is preferred to treat hirsuitism. It mainly involves competition for androgen receptors in hair follicles. It is dose involve 25-100 mg twice a day. Approximately 20% women will have increased menstruation with its use. It is contraindicated in women with renal impairment.[23]

2. Cyproterone Acetate: Cyproterone acetate **(4)**, a progestogen is used in combination with oral contraceptives for PCOS.[24]



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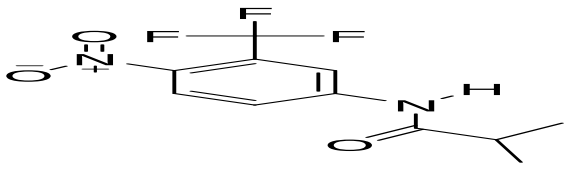
3. Flutamide: An non steroidal anti-androgen **(5)** has been found to be effective against hirsuitism. It cause dry skin and tetratogenicity. For PCOS, combination therapy of Flutamide with lifestyle and metformin is preferred.[25]



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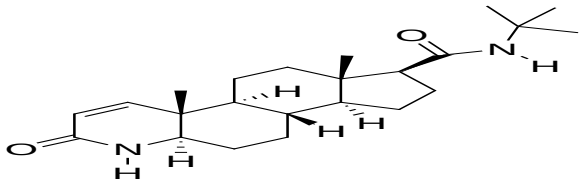
4. Finasteride: An enzyme, Type II 5α reductase, present in the hair follicles is inhibited by Finasteride **(6)**. The dose of 5 mg/day is given to women with post-menopausal and hyperandrogenic condition. It is more acceptable than other anti-androgens, and also has minimum renal and hepatic toxicity.[26]



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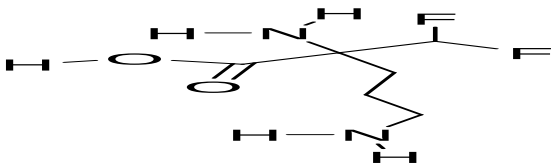
5. Ornithine decarboxylase inhibitors: A potent inhibitor of Ornithine decarboxylase, Eflornithine **(7)** has been found to treat hirsuitism. It is available as eflornnithine hydrochloride and is applied twice daily to the affected areas. However, the relapse of unwanted hairs are common after stopping.[26]



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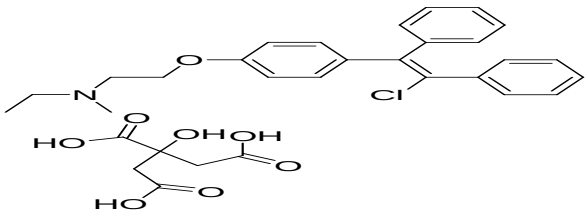
- **Treatment for anovulation or infertility**

1. Clomiphene Citrate: The first-line treatment for infertility is anti-estrogen clomiphene citrate **(8).**[27] It acts as a anti-estrogen to improve gonadotropin secretion. The main risk factors include high rate of multiple pregnancies (7.8%), majority of which include twins.[28]



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2. Gonadotropins

The second-line treatment includes gonadotropins and laproscopic ovarian surgery. They induce ovulation in women with PCOS, in which first-line treatment failed. Only small dose is effective, with low risk of ovarian hyperstimulation syndrome.[29]

3. Laproscopic Ovarian surgery

It is included in the second line treatment in PCOS women. It is a temporary therapy and clomiphene may be required.[30] It do not improve metabolic abnormalities in PCOS women.[31]

CONCLUSION

The Polycystic Ovary syndrome (PCOS) is a most common disorder now-a-days found in women all over the world. In this review we have tried to cover all the basic information required about PCOS. This review will help many women out there, to understand the reason and treatment regimen available in PCOS condition. Also, the women will understand the basic criteria and preventive measures required to avoid this anovulation condition.

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