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Association between PCOS And ACNE: A Review

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ABSTRACT

Polycystic ovary syndrome (PCOS/PCOD) is a reproductive and metabolic disorder concerned with the ovaries. Most women with PCOS show facial acne lesions and up to 50% of women affect the neck, chest, and upper back. The leading cause of acne is excessive ovarian and/or adrenal androgen secretion. Hence, the association between PCOS and acne has been the subject of numerous studies, but the exact nature of this relationship remains unclear. This review aims to summarize the current literature on the relationship.

Keywords Polycystic ovary syndrome, Acne, Hyperandrogenism

INTRODUCTION

Polycystic ovary syndrome (PCOS/PCOD) is a reproductive and metabolic disorder concerned with the ovaries. An ovary is an active organ that changes its form, appearance, and shape according to its hormonal ambiance. PCOD or PCOS is a condition in which ovary of women of childbearing age is enlarged and starts producing an excessive amount of male hormones (androgens).[1] Most women with PCOS grow many small cysts on their ovaries. That is why it is called polycystic ovary syndrome.Stein-leventhal syndrome is another name for PCOS, named for the two physicians who first identified it in 1935. Women with PCOS (polycystic ovarian syndrome) usually have several little cysts along the perimeter of their ovaries.[2] Hence, PCOS is characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovaries.[3]

PATHOPHYSIOLOGY

When ovaries are polycystic, they have an abundance of small cysts (less than 8 mm in size) and produce more follicles each month than usual. When compared to normal ovaries, polycystic ovaries begin to produce at least twice as many follicles, the majority of which enlarge and mature but do not release an egg. The cysts are the egg-containing follicles that do not develop properly because of hormone disturbance. In 1989–1995 there was a proposal that androgen secretion dysregulation, or functional ovarian hyperandrogenism (FOH), was the etiology of PCOS.There is still a lack of full knowledge regarding the underlying pathophysiology of PCOS. Numerous underlying pathophysiologic pathways are most likely present due to the variability of this illness.

1) Increased secretion of luteinizing hormone (LH) is the outcome of a change in gonadotropin-releasing hormone secretion.
2) Hyperinsulinemia and insulin resistance are brought on by changes in insulin production and action.
3) An increase in the production of androgen by the ovaries due to a malfunction in androgen synthesis[2]

EPIDEMIOLOGYANDCLINICAL PRESENTATION

PCOS is a prevalent endocrinopathy that affects 8–13% of females reproductive age.[4] PCOS is characterized by hyperandrogenism, ovulatory dysfunction, and polycystic ovaries, which can lead to a variety of clinical manifestations,

including acne as well as androgenetic alopecia, and acanthosis nigricans. Other symptoms, including irregular periods, weight gain, and undesirable facial, chin, and back hair growth/ hirsutism, Oligoovulation etc.[5]

PCOS and ACNE

Acne is a prevalent skin ailment that affects many adults as well as over half of all adolescents.[2]The pooled estimated prevalence of acne in adult PCOS women was 42-59%.[6] Acne is one of the cutaneous manifestations of PCOS. Most women with PCOS show facial acne lesions and up to 50% of women affect the neck, chest, and upper back . The leading cause of acne is excessive ovarian and/or adrenal androgen secretion. Most females with PCOS have high plasma concentrations of androgens. Testosterone and androstenedione are indicators of ovarian androgen hormone secretion.[7-10]
Much research has been done on the dermatological manifestations of PCOS. To understand the connection between PCOS and acne, one must first understand the pathophysiology of acne in the context of insulin resistance and hyperinsulinemia.
PCOS leads to increased levels of LH, and in response to these heightened levels, there is an increase in androgen production. Elevated LH levels are a hallmark of those diagnosed with PCOS. Due to the high levels of LH, there is an increased production of androgens. High levels of androgens can then stimulate the sebaceous glands in the skin to produce more sebum, causing abnormal desquamation of follicular epithelial cells resulting in comedones formation. Moreover, the high levels of LH cause an overstimulation of androgen receptors which then lead to an enhanced response of macrophages and neutrophils causing a direct increase in sebum production, provoking acne vulgaris .

In addition, insulin resistance can lead to acne formation through its effects on insulin-like growth factor 1 (IGF-1). Hyperinsulinemia leads to increased binding to IGF-1 receptor, IGF-1 is also found on epidermal keratinocytes and so an increase in the insulin levels will result in increased proliferation of basal keratinocytes which can then lead to acne formation.

Inflammation also plays a vital role in acne formation as acne vulgaris is characterized by chronic inflammation of the pilosebaceous unit. Women with PCOS are in a chronic proinflammatory state. As such, the genes that are related to inflammatory cytokines such as tumor necrosis factor alpha, interleukin 6, and interleukin 1, have been hypothesized to be overexpressed.

Hence, Acne is brought on by modifications to the sebaceous gland and hair follicle that are connected to the skin as a result of androgen stimulation. Androgens results in overproduction of the sebum causing abnormal keratinization resulting in comedones formation, additional colonization of the follicles by Propionibacterium acnes (P acne) leads to inflammation and later development of , pustules, papules, nodules, cysts, and scars.[11,12,13,14]

DIAGNOSIS

In order to determine the causes of PCOD,clinicianwill first inquire about symptoms, including irregular periods, acne, weight gain, and undesirable facial, chin, and back hair growth. In addition, eating and drinking habits as well as medical history.

Several tests to identify PCOD namely A pelvic exam swollen or enlarged ovaries, Ultrasound determines the size of the ovaries and detects the presence of cysts. The test may also major the uterine lining's thickness. This equipment checks ovaries for cysts using sound waves. Bloodtestfor the amount of androgens (male hormones) in blood.[15]

RECENT MEDICINES USED IN REGULATING PCOS:

Certain medicines are used globally to regulate PCOS and The first line of pills that are used to prevent hirsutism, acne, and irregular menstrual periods are oral contraceptives. Oral Contraceptives are the pills, which are appropriately composed of hormones and they start an artificial menstrual Cycle in women so as she can get a withdrawal bleeding. These pills Also possess good treatment for excess hair and acne Because they contain a small dose of male hormone Blockers. These pills result in very low levels of free Testosterone in the body. While having these pills, one Cannot get pregnant.[1] Some drugs that contain CPA Cyproterone acetate, are Enormously useful drugs for the management of severe Androgen-excess disorders. CPA is an androgen-blocker—Which means it suppresses the ovarian production of Testosterone—and it is a progestin, so it protects the uterus Against cancer and lightens menstrual periods. It is ususually Given with estrogens.

ACNE MANAGEMENT

Acne is common in PCOS patients. Combined oral contraceptives COCs are first-choice therapy for treating acne in PCOS patients and can be used in combination with topical acne therapy or as monotherapy.

Spironolactone, oral antibiotics, and metformin can be either added as second-choice medications if COCs are inadequate. Isotretinoin can be considered when acne is severe and unresponsive to COCs, spironolactone, and oral antibiotics Hence, the association between PCOS and acne has been the subject of numerous studies, but the exact nature of this relationship remains unclear.[4]

CONCLUSION

PCOD or PCOS is a condition in which ovary of women of childbearing age is Enlarged and starts producing an excessive amount of male hormones (androgens) and is the main cause of infertility, diabetes, irregular Menstrual periods, and hirsutism. No exact cause of the disease has been found yet. There are medicines, which can induce an artificial menstrual Cycle and regulate the level of hormones and ultimately treat the three signs of PCOS i.e. Acne, Hirsutism, and Obesity.

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