



## To Investigate the Hormonal Profile, Clinical Characteristics and Epidemiological Features of Adult Females with Ovarian Cancer

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### ABSTRACT:

**BACKGROUND:** Acne vulgaris (AV) is a common chronic inflammatory skin disease that is considered one of the diseases of civilization because of the significant influence of environmental factors on the frequency and severity of these lesions. The disease affects about 9.4% of the world's population. While adolescence is the typical time for it to happen, it can occur at any age between 11 and 30. Around the ages of 15 and 18, when puberty is most likely to have begun, is when AV is most common in late adolescence. Up to 100% of adolescents and 80% of adults in this age group are believed to be affected. Usually starting in the second decade of life, the dermatosis gradually becomes milder as people age and eventually disappears at the end of the second or beginning of the third decade. However, in certain cases, the disease has persisted into the third or even the fourth decade of life. Analyzing the patients' pre-treatment hormonal profiles and the hormonal parameters that were chosen for post-treatment was the aim of this study. The initial objective was to look at the connection between a few hormonal markers and the severity of acne prior to treatment.

**MATERIAL AND METHOD:** Adult female patients over 25 who presented with signs and symptoms of acne vulgaris to the hospital's outpatient dermatology department were the subjects of this cross-sectional study. For the purpose of the study, 100 patients—50 cases and 50 controls—were assembled using a sequential sampling technique. Each research subject provided their informed consent. After a comprehensive medical history and physical examination, the patient's habits, the location of additional skin lesions and acne lesions, any related disorders, and the connection between menstrual cycle and acne flare-ups were all noted. We asked the patients about their age, height, weight, and regularity of menstruation.

**RESULTS:** Nine (9%), twenty (20%), and four (4%) patients had hyperseborrhea, hirsutism, and androgenic alopecia, respectively. Of the patients, 11 (11%) had irregular menstrual cycles. Twelve patients (12%) and one patient (1%), respectively, observed seasonal variations linked to acne in the summer and winter. Thirteen (15%) of the patients had a history of stress. According to the reports, 18 (18%) and 17 (17%) patients, respectively, consumed dairy and oily foods.

**CONCLUSION:** Acne is one of the most common and easiest skin disorders to diagnose in dermatological practice. When hormonal screening was performed, we only found abnormal levels in a small subset of patients who also showed clinical signs of hyperandrogenism. Hormonal therapy is an effective way to treat female acne even in situations where the serum androgen levels are normal. Further studies comparing women with aberrant androgenic parameters to those with normal

androgenic parameters about their response to anti-androgen therapy may provide light on the role androgens play in female acne.

**KEYWORDS:** Acne Vulgaris, Hyperandrogenism, Laboratory Markers, Profile, Hormonal Factors, Contraception and Treatment.

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### **Introduction:**

The skin disorder known as acne vulgaris (AV) is characterized by comedones, papules, pustules, nodules, and cysts as well as irritation of the sebaceous glands. This is a chronic skin condition that can worsen as a result of scarring, post-inflammatory hyperpigmentation, and keloids. Acne is a common skin disorder that both dermatologists and internists see frequently in their patients. Despite the fact that men are more likely to have severe cases, research has shown that acne vulgaris is more frequent in women and may even run in families. Teens and young adults are more likely to experience it than people over the age of fifty or children under the age of ten. Over 80% of young individuals are thought to be affected by acne vulgaris, which results in over 14 million medical visits annually.<sup>1</sup>

Acne vulgaris, a prevalent skin condition in young adults and adolescents, is commonly caused by *Propionibacterium acnes*. It may continue into maturity. In a similar vein, acne can affect both newborns and kids. One of the condition's hallmarks is excessive sebum production. People with acne vulgaris might have a range of skin lesions, including comedons, papules, pustules, or mixed patterns. In some situations, their scars might also be apparent. A number of factors, including hormones and inflammatory mediators, are involved in the pathogenesis of acne. Testosterone is a prominent androgen that affects the skin.<sup>2</sup> Acne has also been linked to sebaceous hypersensitivity to androgens, according to reports. Additionally, androgens contribute to the development of hyperkeratinization. Hirsutism can also be brought on by hyperandrogenism.<sup>3</sup>

It is critical to take into account both the possible therapeutic advantages of anti-androgens as well

as the relationship between acne and other hyperandrogenism-related symptoms while treating acne sickness symptoms. Therapy can help prevent diabetes and cardiovascular diseases, which are common in these individuals. Hyperandrogenism is a noteworthy clinical indication of polycystic ovarian syndrome (PCOS). Anomalies in the metabolism of androgens and estrogens have been connected to PCO.<sup>4</sup> All PCOS subjects should be considered at risk of atherosclerosis. *Propionibacterium acne* growth, aberrant follicular keratinization, elevated sebum production, and inflammation are all factors in the pathophysiology of acne. *Propionibacterium* may have the function of obstructing follicles, which triggers an inflammatory response. The back, chest, and face are where the lesions are usually found. Patients, particularly women, may experience cosmetic concerns when acne vulgaris affects the face. Patients with acne who receive inadequate treatment or no treatment at all may experience negative effects on their quality of life.<sup>5</sup>

In addition to over-the-counter remedies, prescription medications are now available for the treatment of acne.<sup>6</sup> Anti-androgens may be used early in patients who are resistant to first therapy because of the function that androgen plays in the pathophysiology of acne vulgaris. Serum androgen levels should always be measured in acne vulgaris patients. This is especially crucial in patients with severe, treatment-resistant, or late-onset acne vulgaris. Anti-androgens may be used in the treatment of patients who fit this description if their serum androgen levels are consistently elevated.<sup>7</sup>

### **MATERIAL AND METHODS**

This cross-sectional study involved adult female patients over 25 who came to the hospital's outpatient dermatology department with signs

and symptoms of acne vulgaris. Using a successive sample technique, 100 patients—50 cases and 50 controls—were gathered for the investigation. Every study participant gave their informed consent. Following a thorough medical history and physical examination, notes were made regarding the patient's habits, location of acne lesions and other skin lesions, associated diseases, and the relationship between acne flare-ups and the menstrual cycle. Age, height, body weight, and regularity of menstruation were all inquired about from the patients. Additionally, each participant provided information on their eating habits, such as consuming fatty and sweaty meals or milk and fish, as well as information on their history of acne, hirsutism, androgenetic alopecia, and whether they had family members with the condition.

#### Sample Collection Criteria

Five milliliters of venous blood were drawn from the antecubital vein, and the separated serum was kept at  $-20^{\circ}\text{C}$  until the assay. The time of the serum sample collection during the menstrual cycle was not required. An enzyme-linked immunosorbent assay was used to evaluate the levels of the three androgens in the serum: testosterone, DHEAS, and androstenedione (ELISA).

Calculations were made to determine the prevalence of anomalies in testosterone,

prolactin, luteinizing hormone (LH), follicle-stimulating hormone (FSH), LH: FSH ratio, antimullerian hormone (AMH), and serum insulin. LH: FSH ratio of  $>2:1$  was considered abnormal. Additionally, an ultrasound of the pelvis and abdomen was done to check for any abnormalities.

#### STATISTICAL ANALYSIS

The Statistical Package for Social Sciences (SPSS) version 21.0 was used to analyze the data. Frequency distribution tables were used to display the individuals' clinical and sociodemographic details. For continuous data that were normally distributed, the mean and standard deviation were calculated; for skewed continuous variables, the median and interquartile ranges were calculated. Frequencies and percentages were used to represent categorical variables.

#### RESULT:

For this investigation, a total of 120 female patients who were older than 25 were chosen. Just 100 of them consented to take part in the research. Ten patients (10%) experienced late-onset acne, while thirty patients (30%) had persistent acne. Twelve patients (12%) had skin types that were normal. There were 23 (23%) and 5 (5%) patients with oily and dry skin, respectively.

**Table 1: Acne characteristics and its correlates in adult female patients**

Parameter	Result
<b>Acne type n (%)</b>	
Late-onset	10 (10%)
Persistent	30 (30%)
<b>Skin type n (%)</b>	
Normal	12 (12%)
Oily	23 (23%)
Dry	5 (5%)
<b>Hyperseborrhea n (%)</b>	9 (9%)
<b>Hirsutism n (%)</b>	20 (20%)
<b>Androgenic alopecia n (%)</b>	4 (4%)
<b>Menstrual cycles n (%)</b>	
Regular	32 (32%)
Irregular	11 (11%)
<b>Menstrual flare n (%)</b>	

Yes	34 (34%)
No	12 (12%)
<b>Seasonal variation n (%)</b>	
No	34 (34%)
Summer	12(12%)
Winter	1 (1%)
<b>Stress n (%)</b>	15 (15%)
<b>Habits n (%)</b>	
Oily food consumption	18 (18%)
Dairy food consumption	17 (17%)
Use of cosmetics	10 (10%)
Smoking	3 (3%)
Application of oil	9 (9%)
Manipulation	10 (10%)
<b>Pigmentation n (%)</b>	24 (24%)
<b>Scarring n (%)</b>	31 (31%)

Nine (9%), twenty (20%), and four (4%) patients had hyperseborrhea, hirsutism, and androgenic alopecia, respectively. Of the patients, 11 (11%) had irregular menstrual cycles. Twelve patients (12%) and one patient (1%), respectively, observed seasonal variations linked to acne in the summer and winter. Thirteen (15%) of the patients had a history of stress. According to the reports, 18 (18%) and 17 (17%) patients, respectively, consumed dairy and oily foods. Ten patients (10%), three patients (3%), nine patients (9%), and ten patients (10%) reported using cosmetics, smoking, using oil, and manipulating acne lesions, respectively. Of the patients, 24 (24%) had pigmentation, and 31 (31%) had scarring.

**Table 2: Hormonal profile in adult female patients with acne**

<b>Hormonal abnormality</b>	<b>N (%)</b>
Elevated testosterone	8 (8%)
Normal DHEAS	100 (100%)
Normal prolactin level	100 (100%)
Elevated LH level	5 (5%)
Decreased FSH level	3 (3%)
Elevated LH: FSH level	5 (5%)
Elevated AMH level	1 (1%)
Increase in insulin level	8 (8%)

Eight individuals (8%) showed high testosterone levels overall. Among individuals with increased levels, the mean (SD) blood testosterone level was 48.53 (0.66) ng/dl. The study population's mean (SD) level of LH was 3.44 (1.37) IU/L. Three patients (3%) had decreased FSH levels and five individuals (5%) had increased LH levels. Every patient had normal DHEAS and prolactin levels. Five patients (5%) exhibited high levels of LH:FSH.

One patient (1%) and eight patients (8%) had elevated AMH and insulin levels, respectively.

#### **DISCUSSION**

Acne is a common ailment because sebaceous gland 5 $\alpha$ -reductase type 1 activity is higher in the face than in other areas. Sebum overproduction is a major contributing factor. It's often found during puberty since circulating androgen levels rise during puberty. Numerous studies have attempted, albeit with various degrees of success, to establish a relationship

between the severity of acne and clinical markers of androgen or androgenic levels, despite prior research showing no correlation between androgenic and acne. Although it works just as well for women with normal blood androgen levels, hormonal therapy is advised for women who exhibit hyperandrogenism. Endocrinologic abnormalities are rare in acne patients, although in women, they could be the only clinical sign of excess androgen.<sup>8</sup> This problem may be primarily caused by the pilosebaceous unit's end-organ sensitivity to androgens.

the study of **Zaenglein et al.2012**<sup>9</sup> where it was observed that acne could persist to the third decade and beyond. Clients sometimes seek assistance from other sources, such as beauticians, drug vendors, chemists, and market cream sellers, before presenting to the dermatologist, which could also explain the comparatively high mean age of the participants. A US study by **Collier et al.2008**<sup>10</sup> consisting of 1,013 participants of both genders reported a mean age of 48.0 years which was higher than the mean age in this study. A plausible rationale could stem from their community-based research approach. The most prevalent type of acne observed in this study was moderate acne. Compared to patients with late-onset acne, there were significantly more patients in our research who had chronic acne. Our observations are in accordance with the study conducted by **Khunger and Kumar 2012**.<sup>11</sup> There were both male and female patients in this study, however the proportion of female patients was higher (82.1% versus 17.9%). In females, acne-related lesions are more commonly found on the lower face, especially around the chin and jawline. However, a large number of adult female patients might not look like this. The cheeks were the most often afflicted location in our analysis. The second most often affected area by acne lesions was the mandibular region. The nose was the least common place for acne lesions, with about 25% of the participants having lesions there. According to a Nepalese study, the perioral area was typically damaged. Reports state that perioral area involvement affected 41% of female patients. In the same

study, 39.7% of patients showed upper facial involvement. The neck and trunk were involved in 19.2% of patients.

A study conducted by **Levell et al.1989**<sup>12</sup>, titled "Acne is not associated with abnormal plasma androgens" noted that none of the serum androgens except dihydrotestosterone correlated with acne severity. One reason for the discrepancy might be that the research's subjects were 16 years of age and older, whereas the subjects in their study were between the ages of 12 and 24. While androgens are involved in the pathophysiology of acne, additional variables that are becoming more and more significant in determining acne severity include gender, genetics, family history, nutrition, usage of comedogenic cosmetics, emotional stress, and psychological issues. Acne is also thought to be largely caused by sebaceous gland reactivity to androgens in the blood. **Cibula et al.2000**<sup>13</sup> found that the severity of acne was not related to serum androgen levels because their patients with severe acne had lower levels of free testosterone, a finding further corroborated by **Henze et al.1998**<sup>14</sup> who also observed that most of their subjects with severe acne had normal serum androgen levels.

Young adult women's acne can be an important clinical hallmark of androgen excess syndrome rather than just a fleeting indicator of adolescence. Limited patients from a single center participated in the cross-sectional investigation. Not all patients who sought laboratory testing finished the studies because they refused or were unable to pay. Larger, multicenter research is necessary to confirm the observations. The role androgens play in the severity of acne vulgaris may be clarified by extensive research in this area.

#### **CONCLUSION:**

Acne is one of the most common and easiest skin disorders to diagnose in dermatological practice. When hormonal screening was performed, we only found abnormal levels in a small subset of patients who also showed clinical signs of hyperandrogenism. So, etiological factors other than hyperandrogenism might possibly contribute to the development of adult acne. Hormonal therapy is an effective way to treat

female acne even in situations where the serum androgen levels are normal. Further studies comparing women with aberrant androgenic parameters to those with normal androgenic parameters about their response to anti-androgen therapy may provide light on the role androgens play in female acne. Population-based studies are preferred because they can provide a more accurate picture of the relationship between women's quality of life and blood androgen levels.

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