**ABSTRACT**

**Background:** Acne vulgaris is one of the most common skin diseases affecting majority of the teens and reaching its pinnacle during adulthood. In some severe cases, it leads to pronounced skin deformity which adversely dampen the self-esteem of the affected which can eventually lead to depression and even suicides. Usually this disease invariably diminishes in twenties but in some cases, it might even persist in thirties, forties and beyond. Majority of females suffer from mild to moderate acne at some stage of life. Androgens cause enlargement and overstimulation of the sebaceous glands in people with acne and this leads to overproduction of sebum coupled with sluggish exfoliation process leads to blocked pores and development of acne, so the present study conducted with objectives to compare hormonal levels of serum testosterone, LH, FSH among patients with and without Acne and to compare the hormonal levels in different categories of acne among study participants.

**KEYWORDS**

Acne, Adolescence, Serum FSH, LH, Serum Testosterone.

**INTRODUCTION**

Acne vulgaris is a common disorder of the pilosebaceous unit. Its prevalence in adolescence is estimated to be 70-87% (1). It is one of the most common dermatoses seen in clinical practice. It commonly affects adolescents and young adults and is characterized by open and closed comedones, erythematosus papules and pustules, and in severe cases nodules, deep pustules, and pseudocysts (2). Important pathogenic factors include androgenic stimulation of the sebaceous glands, hyperkeratinization and obstruction of the sebaceous follicles as a result of abnormal keratinization of the infundibular epithelium and microbial colonization of the pilosebaceous unit by Propionibacterium acnes and subsequent perifollicular inflammation (3). Acne can be categorized according to its severity into minor, mild, moderate and severe using the Global Acne assessment (GEA) scale (4).

Acne is a common feature in the course of endocrine diseases characterized by raised levels of androgens. On the other hand raised androgen levels in women with acne have been repeatedly demonstrated in many studies. The skin is a typical target tissue for androgens and testosterone, a major androgen in human blood that stimulate many metabolic processes in the endothelium of sebaceous gland (5). Androgens cause enlargement and overstimulation of the sebaceous glands in people with acne and this leads to overproduction of sebum coupled with sluggish exfoliation process leads to blocked pores and development of acne. It is still not clear how the hormonal stimulation is related to the clinical expression and the course of the disease (6). Increased level of serum testosterone and decreased level of SHBG have been shown in patients with acne (7) and the role of anti-androgen therapy in acne is still under research (8).

**OBJECTIVES**

1. To study the demographic profile of acne.
2. To compare the hormonal levels of serum testosterone, LH, FSH among patients with and without Acne.
3. To compare the hormonal levels in different categories of acne among study participants.

**METHODOLOGY**

**Study Design:** A comparative hospital based study

**Study Setting:** OPD of Department of Dermatology & Venereology in Alluri Sitarama Raju Academy of Medical Sciences, Eluru.

**Study Duration:** April 2015 to March 2016

**Sampling technique:** Convenient sampling

**Sample Size:** Cases and controls were chosen in 1:2 ratio after matching of age and gender. The total number of cases-100 and controls-200.

**Statistical Analysis:** Data was entered in Microsoft Excel sheet. Analysis was done by using SPSS (version 17). Qualitative data was represented as means & standard deviation. Independent sample t test was used to compare between means of the two study groups. For non-normal distribution, Mann whitney U test has been used. A P value of ≤0.05 was considered statistically significant.

**RESULTS**

A total of 300 study participants were included in which 100 were cases and 200 were controls.
Table 1: Distribution of study participants based on socio demographic details

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subcategory</th>
<th>Cases (N=100)</th>
<th>Controls (N=200)</th>
<th>Total (N=300)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>35 (29.17%)</td>
<td>85 (70.83%)</td>
<td>120 (100%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>65 (35%)</td>
<td>115 (63.88%)</td>
<td>180 (100%)</td>
</tr>
<tr>
<td>Age group</td>
<td>10-19 yrs</td>
<td>30 (35.29%)</td>
<td>55 (64.70%)</td>
<td>85 (100%)</td>
</tr>
<tr>
<td></td>
<td>20-25 yrs</td>
<td>35 (30.43%)</td>
<td>80 (69.56%)</td>
<td>115 (100%)</td>
</tr>
<tr>
<td></td>
<td>&gt;25 yrs</td>
<td>35 (35%)</td>
<td>65 (65%)</td>
<td>100 (100%)</td>
</tr>
<tr>
<td>Education</td>
<td>Illiterate</td>
<td>45 (39.13%)</td>
<td>70 (60.86%)</td>
<td>115 (100%)</td>
</tr>
<tr>
<td></td>
<td>Literate</td>
<td>55 (29.72%)</td>
<td>130 (70.28%)</td>
<td>185 (100%)</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>Class I</td>
<td>10 (9%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>Class II</td>
<td>10 (28.57%)</td>
<td>25 (71.42%)</td>
<td>35 (100%)</td>
</tr>
<tr>
<td></td>
<td>Class III</td>
<td>25 (38.71%)</td>
<td>45 (61.29%)</td>
<td>70 (100%)</td>
</tr>
<tr>
<td></td>
<td>Class IV</td>
<td>40 (36.36%)</td>
<td>70 (63.63%)</td>
<td>110 (100%)</td>
</tr>
<tr>
<td></td>
<td>Class V</td>
<td>25 (29.41%)</td>
<td>60 (70.58%)</td>
<td>85 (100%)</td>
</tr>
</tbody>
</table>

Out of 300 study participants 180 were females and 120 were males. Most of the study participants (115) were in the age group 20-25 years. Majority (185) of the study participants were literates. Most of the study participants belongs to class IV socio economic status.

Among cases the most common location of acne was on the face (64%) followed by back, arm, chest etc. (36%).

Figure 1: Distribution of study participants based on Severity of Acne in cases(N=100)

In the present study 45% of study participants were suffering with mild acne, 40% suffered with moderate acne and 15% suffered with severe acne.

Figure 2: Distribution of study participants based on age group vs severity of acne in Cases

DISCUSSION
Mild acne includes whiteheads (closed clogged pores) and blackheads (clogged pores that are open at the skin surface and more easily noticeable). Moderate or severe inflammatory acne includes whiteheads and blackheads plus papules (reddened areas that are elevated above the skin surface) and areas of pustules (pimples—small bumps on the skin that contain visible fluid) (9).

In the present study a total of 100 cases and 200 controls were included. Acne distribution: Among the participants 45% were suffering with mild acne, 40% suffered with moderate acne and 15% suffered with severe acne. Similar findings were observed in a study done by Reena Kumari Sharma et al (10) who found that mild acne as major group.
These findings were not consistent with other reports in adult female groups (6, 11). While in a study, Borgia et al., showed minor acne as major group (5). A study performed in Bangladesh showed moderate acne as major group (8).

Location: Among cases the most common location of acne was on the face (64%) followed by back, arm, chest etc, (36%). Our study findings were consistent with study done by Yousif Bahaaddin Ahmed in Erbil city Iraq (12) who found that 63.3% of study participants had involvement of the acne on the face. Two different types of AOA are known: persistent acne and late-onset acne. Persistent acne affects 82% of patients and is characterized by continuation of acne from adolescence to adult life (13).

Affected Age Group: During adolescence, acne vulgaris is more common in males than in females. Acne vulgaris may be present during the first few weeks and months of life, this neonatal acne tends to resolve spontaneously. However, Adolescent acne usually begins with the onset of puberty, when the gonads begin to produce and release more androgens (9).

In the present study, mean age of presentation of acne was 22±4.73 years. This finding is similar to a study conducted by Borgia et al. (6). In a study on correlation between endocrinological parameters and acne severity in adult women above 17 years of age, the mean age of presentation was 24 years. Rehman et al. (8). In a study performed in Bangladesh on association of serum testosterone with acne vulgaris in women, the mean age of presentation was 22.43 years. However, the mean age of presentation was 22.1 years in a report from Iran (14).

Serum testosterone hormone: In this study higher levels of serum testosterone hormone was seen among cases than controls. Similar findings were found in the study done by Yousif Bahaaddin Ahmed in Erbil city Iraq (12) and Ewadh M in Malaysia (5). Elevated serum testosterone can be attributed to the locally produced androgens and testosterone (15). An essential role for androgens in stimulating sebum production is supported by several lines of evidence. For example, the development of acne in the prepubertal period has been associated with elevated serum levels of DHEAS, a precursor for testosterone (16). Another factor which will contribute to the increased number of dead skin cells and this enhances the skin regeneration rate (as well as the death rate of existing skin cells). The increased number of dead skin cells gets deposited in the hair follicles of the skin also produces sebum and this enhances the skin regeneration rate (as well as the death rate of existing skin cells). This also attracts bacteria. This leads to the skin openings getting clogged and as a result, pimples are formed (18). And this entire exercise gets started due to an increase in the production of hormones. Thus it is referred to as hormonal acne.

Serum FSH & LH hormones: In our study the levels of serum FSH & LH hormones were similar in both cases of controls. Similar findings were found in the study done by Yousif Bahaaddin Ahmed in Erbil city Iraq (12). In all women or children with acne the possibility of a hyperandrogenic state should be considered. The presence of irregular menses and hirsutism increases the likelihood of finding clinically significant hyperandrogenism. (15).

CONCLUSION

The study showed presence of significant association between serum testosterone levels with acne vulgaris, which is a great cause of psychological and cosmetic problem in young adults. Higher levels of these hormones mandates treatment which lowers the level of these hormones which can reduce different forms of acne, particularly which are resistant and refractory to other non hormonal modalities of treatment.

REFERENCES