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A Study of Hormonal Profile (Luteinizing Hormone, Estrogen, Follicle Stimulating Hormone and Prolactin) In the Women Suffering From Acne Vulgaris.

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ABSTRACT

Background: Acne vulgaris is a pilosebaceous gland disease usually affecting people from puberty to young adulthood due to hormonal changes, but the exact relationship of various hormone to acne is not known. Aims:- The present study has been planned to find out the association of hormonal status with the different grades of acne vulgaris female patients.. **Methods:** Fifty patients each of Mild (group I), Moderate (group II) and Severe Acne Vulgaris (group III) in age group 15-40 years were included as cases. The fasting blood samples were collected on the second day of menstrual cycle of the patient and before the start of treatment. Written and informed consent was taken from all subjects in the cases and control groups after explaining about the details of the study. **Results:** Levels of Luteinizing Hormone (LH), Estrogen, Testosterone, Insulin, Follicle Stimulating Hormone (FSH) and Prolactin in different grade of acne vulgaris patients were compared with control groups. Statistical analysis was done using Kruskal Wallis test and ANOVA. **Conclusion:** Level of LH, Estradiol,Testosterone andInsulin may be studied in cases resistant to conventional treatment of acne in women while the levels of FSH and prolactin, need not to be studied.

Keywords: Acne Vulgaris, Luteinizing Hormone, Estrogen, Testosterone, Insulin.

INTRODUCTION

Acne is common disease of skin which affects 20-90% of all adolescents, in late teens or early twentieswith spontaneous resolution in most cases,[1] but can continue up to 40 years of age in some people.[2] Acne outcome is definitely regarded as highly dependent on sebum production. Beside the hyper-production of sebum, other functions of the sebaceous glands may be involved in acne process: oxidant/antioxidant ratio of skin surface lipids, regulation of local androgen synthesis, production of antimicrobial peptides, neuropeptides and synthesis of specific lipids with antimicrobial activity such as sapienic acid. Acne is not caused by excess hormone levels, but an abnormal reaction to normal levels of these hormones. By early recognition, the etiology and treatment protocol of acne may prevent unwanted conditions.[3] Since first clinical description, acne has always subject of great number of studies and research. But only few of them dealt with history of the disease focusing on semantic considerations. Therefore, in present work estimation oflutenizing hormone (LH), Follicle Stimulating Hormone (FSH), Estrogen, Testosterone, Prolactin and Fasting insulin in serum of patients with different grade of acne vulgaris has been analysed with focus on study of variations in the levels of hormones and to compare with control groups.

Aims & Objectives

The present study has been planned to find out the association of hormonal status with the different grades of acne vulgaris female patients.

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MATERIALS AND METHODS

Study population

Fifty patients each of Mild (group I), Moderate (group II) and Severe Acne Vulgaris (group III) in age group 15-40 years were included as cases.

Study Area
The case control study was carried out in the Departments of Biochemistry and Dermatology & Venereology of SGT Medical College Gurgaon.

Study duration:-
Duration of this study was one year.

Sampling technique & Data collection
The fasting blood samples were collected on the second day of menstrual cycle of the patient and before the start of treatment. Written and informed consent was taken from all subjects in the cases and control groups after explaining about the details of the study.
Estimation of luteinizing hormone (LH), Estrogen, Insulin, Follicle Stimulating Hormone (FSH), Testosterone and Prolactin were done by standard technical methods i.e. by using commercially available CLIA kits for use on IMMULITE 2000 systems.

Inclusion Criteria
The Inclusion criteria for groups were based onopen and closed comedones, papules and pustules, detailed clinical history and examination. Fasting sample for estimation of all parameters was taken on second day of menstruation after the diagnosis was confirmed. Fifty healthy age matched females were recruited for the study as controls (group IV). Controls consisted of healthy volunteers without any prior history of medical disorders. Fasting sample was taken for the controls also.

Exclusion Criteria
Exclusion criteria for cases were those who were on immunosuppressive therapy like corticosteroids, regular analgesic intake and hormonal therapy and those with concomitant inflammatory or autoimmune disease, acute or chronic infections and acute or chronic inflammatory disorders.

Ethical Approval detail
Duration of this study was one year and Institutional ethical committee clearance was taken well in advance before starting the study.

Data Analysis
Data were analyzed by using ANOVA.

RESULTS

In the present study, the mean values for age did not show significant variation in case when compared with control group (Table 1). The difference in mean values of LH was found to be significantly higher in cases of severe acne as compared to control (P < 0.001).
The difference in mean values of Estradiol was found to be significantly higher in cases with mild (P <0.031) and moderate (P <0.006) acne as compared to control (P <0.001).However the difference of mean values of Follicle Stimulating Hormone (FSH) of control and those with mild, moderate and severe acne was not found to be statistically significant.
Testosterone was significant lower (P> 0.001) in control group as compared to cases of study group (mild, moderate and severe).Prolactin was found statistically not significant although the mean values were mildly raised in all cases of acne as compared to controls.

Table 1: Hormonal level in cases of mild, moderate and severe acne as compared to control.

Hormones	Cases (Mean + SD)			Control (Mean + SD)
	Mild	Moderate	Severe	
Leutinizing Hormone (LH) (in mlU/ml)	7.60 + 5.92 *	7.73 + 5.76 *	11.24 + 6.02 P(<0.001)	6.73 + 5.29
Follicle Stimulating Hormone(FSH) (in mlU/ml)	6.54 + 2.20 *	6.34 + 2.28 *	6.63 + 3.03 *	6.34 + 2.22
Insulin (in µIU/mL)	17.74 + 7.67 *	20.11 + 9.30 P(0.016)	15.07 + 7.85 *	15.63 + 8.36
Testosterone (in ng/dl)	1.17 + 0.70 P(0.001)	1.37 + 0.67 P(<0.001)	1.30 + 0.71 P(0.001)	0.76 + 0.51
Prolactin (in ng/ml)	15.90 + 11.12 *	15.50 + 11.16 *	15.84 + 17.38 *	14.58 + 9.55
Estradiol (in pg/ml)	97.48 + 71.78 P(0.031)	107.95 + 79.79 P(0.006)	63.82 + 54.08 *	66.61 + 49.23

* Non significant

DISCUSSION & CONCLUSION

In the present study, acne seems to be mostly found in 15-20 years of age group where as only 12% cases have severe acne between 31 to 35 years of age group. The severe acne was found significantly in higher age group as compared to mild and moderate acne.[4]

Increased LH is due to pulsatile secretion at hypothalamic level and high estrogen environment at pituitary level in body.[5,6] Theca lutein cell of ovarian follicle secrete androgens under the influence of LH in an incremental manner up to the point of desensitization. However, high levels of LH might be in those cases which may lead to Polycystic

Ovarian Disease(PCOD). Since PCOD is associated with hyperandrogenism and acne vulgaris as one of its manifestation, it can be presumed that case of severe acne seen by us with increased levels of LH may be having underlined PCOD.[7]

The increase in mean values of estrodiolin mild and moderate acne cases might be due to the reason that estrogen level are increased because of extraglandular aromatization of increased circulating androstenedione levels.[8] However the decrease in mean value of estradiol in severe cases may be attributed to that Estrogen, in high doses, decreases the size of sebaceous gland and reduces sebum production by reducing endogenous androgen production via a negative feedback effect on the pituitary gonadal axis.[9]

The levels of testosterone shows a significant association between control and cases, thereby suggesting that it does not contribute to the severity of the disease but the sensitivity of androgen receptors present in the sebaceous glands to the androgen. The elevation in testosterone can be attributed to the increased number of dead skin cells being deposited in the hair follicles of the skin, attracts bacteria leading to the skin openings get clogged and as a result, pimples are formed.[6]

Insulin resistance may have a role in the pathogenesis of acne and there exists a positive correlation between insulin resistance and severe acne vulgaris asthe level of serum insulin was significantly higher in moderate cases of acne as compared to controls. Insulin stimulates the secretion of ovarian estrogen, androgen and progesterone which is also in consistent with our studies as increase in estrogen and testosterone has been also observed in moderate cases of acne suggesting that hyperinsulinemia can promote hyperandrogenism and possibly also vice-versa.[10,11]

The hyperprolactinaemiain present study may be associated with increased secretion of adrenal androgen by zona reticularis, thereby causing acne but does not reveal any significant difference between cases and control in this study.

From the present study it may be opined that Level of LH, estradiol, testosterone and insulin may be studied in cases resistant to conventional treatment of acne in women and in those with history and clinical features suggestive of PCOD or hyperandrogenism. However the testosterone do not contribute to the severity of the disease but any hormonal imbalance found may be correlated to help management of such cases.

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