STUDY OF CORRELATION BETWEEN STRESS AND ACNE VULGARIS IN YOUNG UNMARRIED FEMALES

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ABSTRACT

BACKGROUND

Although there is widespread acceptance of a relationship between stress and acne, not many studies have been performed to assess this relationship in Indian population particularly in unmarried females. The objective of this study was to determine the relationship between stress and acne severity.

MATERIALS AND METHODS

A case control study was planned to study the association. All the subjects were assessed on Perceived Stress Scale to assess the level of stress they may have felt over past one month. All the diagnosed cases of acne vulgaris were assessed by Global Acne Grading Scale (GAGS) to assess the severity of acne. Then the findings were analysed statistically.

RESULTS

The results indicate that there is positive correlation between stress & acne. The cases showed high stress levels as compared to the controls which were statistically significant ($p<0.01$). The severity of acne vulgaris was also seen significantly more in subjects suffering from high stress levels ($p<0.05$).

CONCLUSION

Stress is one of the keen factors in causation as well as exacerbation of acne vulgaris. Also, stress is one factor that can be managed easily & effectively with proper precaution & care. Stress management should also be part of the holistic treatment of acne vulgaris.

KEYWORDS

Stress, Perceived Stress Score, Acne Vulgaris, Acne Grading.

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BACKGROUND

In a medical or biological context stress is a physical, mental or emotional factor that causes bodily or mental tension.[1] Stress occurs when a person faces excessive demands against limited resources.[2] Stresses can be external (from environment, psychological, or social situations)[3] or internal (illness or from a medical procedure). Stress affects 15-70% of population depending upon various sociodemographic parameters.

Acne vulgaris is a common skin disease affecting adolescents and young adults worldwide. It affects over 90% of males and 80% of females in all ethnic groups.[4] Acne significantly affects physical and psychosocial well-being. The pathogenesis of acne vulgaris is multifactorial, and hormones, sebum production and bacterial colonization playing major roles.[5-6]

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Psychological stress has also been identified amongst the causative factors that exacerbate acne.[7] It has been thought that psychological stress can alter the immune functions of the skin[6] and cutaneous barrier function.[7] But there are not many studies done to establish the relationship. This study has been undertaken to reveal the association of stress and acne vulgaris and so its severity in Indian context.

MATERIALS AND METHODS

A case control study was planned as method for this project. The cases were the young unmarried females suffering from Acne vulgaris visiting in the Dermatology Out Patient Department of the hospital. A control group not diagnosed as any psychiatric or any other medical disorder and similar socio-demographic profile as that of cases group was selected for the study. Considering the proportion of controls exposed to risk of stress factor at 40% and keeping Odds Ratio at about 3 with 90% confidence interval and 80% power, the sample size as calculated by Software Open Epi Info came out to be 98 i.e. 49 in each group. We took 50 subjects per group. After taking well informed written consent the subjects were included in the study.

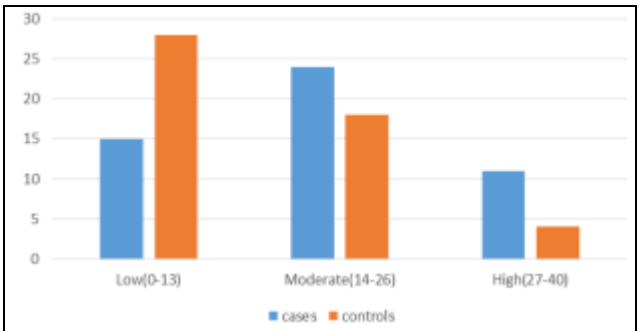
Both the cases and controls were given 14 item questionnaires of Perceived Stress Scale to assess the stress level. This test helps to assess the stress level over the period of one month.[8-9] All the cases were also assessed by Global Acne Grading Scale to assess severity of acne.[10] There are four different grades of acne as per this scale namely comedones, papules, pustules and nodules. The Data was entered in MS EXCEL and analysis was done by calculating Chi square test and p value levels using Chi Square Test Calculator Software of Social Science Statistics.

RESULTS

Perceived Stress Score	Cases	Controls
Low (0-13)	15 (30%)	31 (62%)
Moderate (14-26)	24 (48%)	15 (30%)
High (27- 40)	11 (22%)	4 (8%)
Total	50 (100%)	50 (100%)

Table 1. Overall Perceived Stress Score

X^2 =16.9088, p= 0.004277(<0.01) significant.



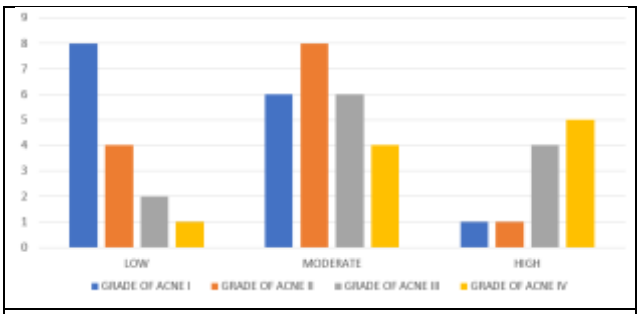
Graph 1. Perceived Stress Score

Graph 1 Shows that there is significant difference in level of perceived stress score amongst cases and controls. It was observed that 38% of controls have moderate to severe perceived stress score compared to 70% of the cases. Whereas 22% of cases have high perceived stress score compared to the 8% of control.

Grades of Acne	Perceived Stress Score			Total
	Low	Moderate	High	
I	8	6	1	15
II	4	8	1	13
III	2	6	4	12
IV	1	4	5	10
Total	15	24	11	50

Table 2. Comparison of Grades of Acne with Severity of Perceived Stress Score

X^2 = 12.6859, p = 0.048 (<0.05) significant.



Graph 2. Grades of Acne

Graph 2 Shows that perceived stress score was low for grade I acne vulgaris whereas it was high in grade IV acne. The severity of acne was associated with increase in stress levels. In cases with Garde I acne 47% had moderate to high stress and 7% had high stress, while those figures for grade II were 69% moderate to high & 8% high, for grade III were 83% moderate to high & 33% high and for grade IV were 90% moderate to high & 50% high stress levels.

DISCUSSION

Our study is done in Indian context where all the cases of Acne vulgaris were assessed for perceived stress which gives the stress at level of the individuals over a period of one month. These stress levels were matched with appropriate socio-demographically similar controls. The results showed that significantly raised stress levels were seen in cases (70%) as compared to controls (38%) while high stress levels were seen in cases (22%) as compared to controls (8%).

The results were in concordance to previous studies done in the past as in Australia, University of Melbourne where 67% of medical students identified stress as an exacerbating factor.[11]

Our study also included to assess the severity of Acne in relation to perceived stress. Our study showed that higher the stress level more severe the acne. That clearly indicates that Stress has strong correlation with severity of acne. This positive correlation was also seen in a multicentric study done in 17 Korean hospitals.[12]

There are a number of proposed mechanisms of why stress aggravates acne. In adult women with acne, chronic stress increases the secretion of adrenal androgens and results in sebaceous hyperplasia.[13,14] Activation of the hypothalamo-pituitary-adrenal (HPA) axis is the main adaptive response to systemic stress. In response to emotional stress, the HPA axis activates increased levels of cortisol release. Corticotropin releasing hormone (CRH) is the most proximal element of the HPA axis. CRH acts as a central coordinator for neuroendocrine and behavioral responses to stress.[15] CRH stimulates sebaceous gland lipid production and steroidogenesis, which contributes to acne.[16,17] Studies have also shown an increase of CRH expression in the sebaceous glands of acne-involved skin, compared to a low expression in normal skin.[18,19] This up regulation of CRH expression in acne- involved skin may influence the inflammatory processes that lead to stress induced acne lesions. CRH also induces cytokines IL-6 and IL-11

production in keratinocytes, contributing to inflammation, which is regarded as a key component in the pathogenesis of acne.[20] Peripheral nerves release the neuropeptide substance P or vaso-intestinal peptide in response to stress. Substance P stimulates the proliferation and differentiation of sebaceous glands and up regulates lipid synthesis in sebaceous cells.[21,22] Also, psychological stress could delay wound healing up to 40%, which could affect the repair of acne lesions.[23]

Our study is amongst the few studies done in the Indian context where mostly the people from semi-urban & rural population were the subjects. We chose young unmarried females as they are more susceptible to stress as well as acne. But we have carefully chosen the controls with similar socio- demographic profile to rule out the bias and our results are also consistent with previous studies done on same subject.

The limitations to our study may be that it is a hospital-based study rather than community based. Secondly stress is very individualized and various studies show much variance in perception of stress.

CONCLUSION

Stress is one of the keen factors in causation as well as exacerbation of acne vulgaris. Also, stress is one factor that can be managed easily & effectively with proper precaution & care. Stress management should also be part of the holistic treatment of acne vulgaris.

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