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Significance of Serum Copper Levels in Patients with Acne Vulgaris

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Abstract

Acne Vulgaris is a long-term skin disease that occurs when hair follicles are clogged with dead skin cells and oil from the skin.

Aim

To evaluate the role of serum copper levels in acne.

Materials and Methods

Around 50 young female patients, aged between 13 to 19 years, suffering from Acne vulgaris and 25 age matched healthy female attenders of patients without acne (control group). The copper levels were measured in the serum obtained from the fasting blood of patients group and control group.

Results

Serum copper levels were in the normal range but lower than those of control subjects.

Conclusion

Low serum copper levels could be one among the causes of acne.

Introduction

Acne is one of the most common skin disorders. It is a disorder of pilosebaceous unit, commonly seen in adolescents and young adults. Most cases of acne present with a pleomorphic lesion consisting of papules, macules comedones and nodules. Although the course of acne may be self-limiting the sequelae can be life-long with pitted or hypertrophic scar formation. It is a syndrome in which neither exogenous agents nor medications are primary causes but they are exacerbating factors. One of the key features is the excess sebum production from the sebaceous glands. While there is virtually no mortality associated with this disease, there is often significant morbidity seen. Physical morbidity of acne results from scarring and due to adverse effects of treatment. Also important is the psychological morbidity of the disease on those afflicted, which affects self-esteem and quality of life. The burden of acne in terms of cost to society is not well defined, but the prevalence of the disease suggests that these costs are high.

Materials and Methods

Young female patients in the age group of 13 to 19 years, with acne attending the out-patient department of Dermatology of a tertiary teaching general hospital, in India during the period from January 2017 to June 2017, were included in this study. Female attenders (friends) of the patients of the same age, without acne comprised of the control group. This study was carried out in 50 acne patients who were labelled as group 1. Normal controls were 25 in number without acne and they were labelled as group 2. The patients were explained about the purpose of the research project and informed consent was taken. This project was approved by ethical committee of the Gandhi Medical College/Hospital, Hyderabad, India. Acne vulgaris at grade IV was diagnosed by comedones, papules, pustules, nodules and cysts on the surface of the skin resulting in inflammation within the dermis brought on by acne. It was further differential diagnosed from Keratosis pilaris, rosacea, and chloracne which exhibit similar symptoms. Selected patients had regular menstrual history and blood samples were collected when the subjects were not menstruating.

Results

Portraits the mean serum Copper levels in patients (119 ± 1.99 μg/dl) which was significantly lower than those in controls (131.2 ± 0.93 μg/dl), (P<0.001). The observation is that the mean copper values are lower in acne patients which is statistically significant (p<0.001) as compared to control.

Discussion

Saleh et al. estimated serum zinc, copper and magnesium levels in 45 Iraqi patients with acne vulgaris and 45 healthy controls, and reported that serum levels of copper did not differ in severe acne group compared with controls, mild and moderate groups of acne patients (P<0.05). The results of El-Saaiee et al. revealed differences in the copper and iron content of the sera between 30 individuals complaining of moderate acne vulgaris type II and healthy individuals, although they were statistically not significant. Sherman et al. estimated serum copper levels in 73 Iraqi individuals with acne vulgaris and in 42 healthy individuals as a control group. The study revealed that there was increase in the level of copper in the patients in comparison with the control group. Using oestrogen releasing birth control or a copper Intra Uterine Device (IUD) can lead to copper toxicity. When more oestrogen is released into the body, it can increase copper retention in the kidneys. Excess copper then builds up in the liver, preventing the liver from detoxifying the blood properly. This can then lead to poor mineral absorption and toxins into the blood stream and of one of the outcomes is chronic acne. In addition, copper levels rise in response to stress. The results of our present study show that the mean of serum copper of patients and controls were within the reference ranges and that the patients had lower serum copper than control. Thus, acne patients showed a decrease in copper levels. Other contributing factors for the occurrence of acne in the patients enrolled in our study could either be due to stress among the adolescent girls or due to sudden upsurge of oestrogen at the onset of puberty.

Conclusion

From the present study we postulate that serum copper levels are considerably at lower levels in acne vulgaris patients when compared to controls in addition to a stressful condition among the adolescent girls. Thus, looking into our results and previous research data from the literature it is advisable to have adjunctive copper therapy (in the form of oral medication as well as in the daily diet) for prevention and management of patients with acne.

Biography

Amanullah M is an Associate Professor from Department of Clinical Biochemistry, College of Medicine, King Khalid University, Saudi Arabia.

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