

Original Research

Evaluation of serum zinc levels in Acne patients: A case-control study

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ABSTRACT:

Background: Acne is an inflammatory disorder of pilosebaceous units and is prevalent in adolescence. Decreased serum zinc levels have been reported in number of cutaneous disorders by some investigators, while others have refuted these findings. Hence; under the light of above mentioned data, the present study was undertaken for assessing serum zinc levels in acne patients. **Materials & methods:** A total of 50 acne patients and 50 healthy controls were enrolled. Complete demographic and clinical data of all the patients was recorded. All the acne patients were divided on the basis of severity into mild, moderate and severe cases. Blood samples were obtained from all the patients and were sent to laboratory where an auto-analyser was used for evaluation of serum zinc levels. **Results:** Mean serum zinc levels among the patients of the acne group and control group was 83.12 µg/dL and 84.68 µg/dL respectively. While comparing statistically, non-significant results were obtained. Mean serum zinc levels among the patients with mild, moderate and severe acne were 89.23 µg/dL, 79.12 µg/dL and 72.36 µg/dL respectively. While comparing statistically, significant results were obtained. **Conclusion:** Serum zinc levels decrease significantly with increasing severity grades among acne patients.

Key words: Acne, Zinc

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INTRODUCTION

Acne is an inflammatory disorder of pilosebaceous units and is prevalent in adolescence. The characteristic lesions are open (black) and closed (white) comedones, inflammatory papules, pustules, nodules and cysts, which may lead to scarring and pigmentary changes. The pathogenesis of acne is multifactorial and includes abnormal follicular keratinization, increased production of sebum secondary to hyperandrogenism, proliferation of *Propionibacterium acnes* and inflammation.¹⁻³

Acne vulgaris is a multifactorial dermatosis which occurs most often during puberty. Its pathogenesis is very complex and can be caused by many factors. The disease is characterized by seborrhea and formation of comedones, pustules and papules in areas rich in sebaceous glands. There is a huge variety of clinical acne. There are patients who have only few blackheads and patients with the general skin involvement, with pustular deep lesions, abscesses and scarring, and, though it rarely occurs, even with

the involvement of the joints, as in the case of acne fulminans. Acne vulgaris can occur in a few forms: acne comedonica, which is dominated by open and closed comedones, acne papulopustulosa, which is dominated by the inflammatory process and acne conglobata, which is the most severe form of acne and except the changes mentioned above, it is characterized with abscesses, fistulas and scars.⁴⁻⁶ Zinc is one of the important trace elements related to health and disease. It is present in all cells and is indispensable for the normal functions of cells, tissues and organs of the body. It is an integral part of a number of metalloenzymes necessary for normal protein, carbohydrate, lipid and nucleic acid metabolism. Decreased serum zinc levels have been reported in number of cutaneous disorders by some investigators, while others have refuted these findings.⁷⁻⁹ Hence; under the light of above mentioned data, the present study was undertaken for assessing serum zinc levels in acne patients.

MATERIALS & METHODS

The present study was undertaken for assessing serum zinc levels in acne patients. A total of 50 acne patients and 50 healthy controls were enrolled. Complete demographic and clinical data of all the patients was recorded. All the acne patients were divided on the basis of severity into mild, moderate and severe cases. Patients with presence of any other co-morbid

condition were excluded. Blood samples were obtained from all the patients and were sent to laboratory where an auto-analyser was used for evaluation of serum zinc levels. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Student t test was used for evaluation of level of significance.

RESULTS

Mean age of the patients of the acne group and control group was 25.6 years and 23.1 years respectively. 80 percent of the patients of the acne group and 82 percent of the patients of the control group were females. Mean serum zinc levels among the patients of the acne group and control group was 83.12 $\mu\text{g/dL}$ and 84.68 $\mu\text{g/dL}$ respectively. While comparing statistically, non-significant results were obtained. Mean serum zinc levels among the patients with mild, moderate and severe acne were 89.23 $\mu\text{g/dL}$, 79.12 $\mu\text{g/dL}$ and 72.36 $\mu\text{g/dL}$ respectively. While comparing statistically, significant results were obtained.

Graph 1: Demographic data

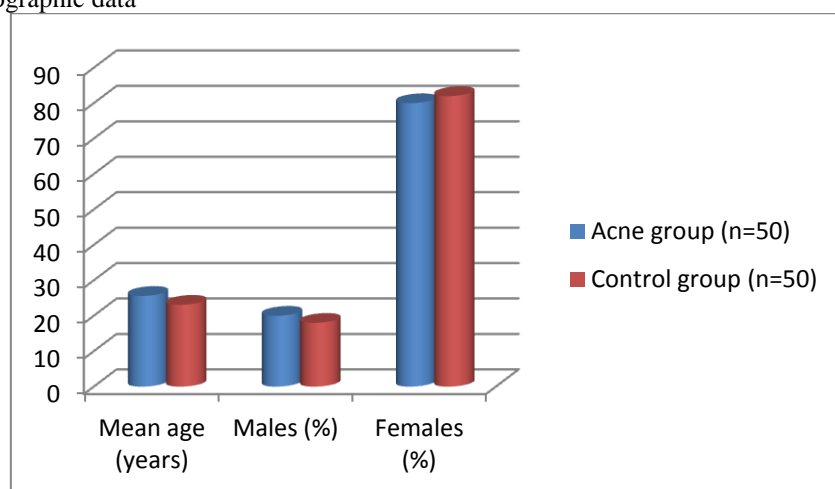


Table 1: Comparison of serum zinc levels

Serum Zinc levels ($\mu\text{g/dL}$)	Acne group	Control group
Mean	83.12	84.68
SD	12.36	14.85
p- value	0.45 (Non- Significant)	

Table 2: Comparison of serum zinc levels among acne patients with different severity

Acne severity	Serum Zinc levels ($\mu\text{g/dL}$)	p-value
Mild	89.23	0.01 (Significant)
Moderate	79.12	
Severe	72.36	

DISCUSSION

Acne vulgaris is one of the commonest skin disorders which dermatologists have to treat, mainly affect adolescents, though it may present at any age. Acne by definition is multifactorial chronic inflammatory disease of pilosebaceous units. Various clinical presentations include seborrhoea, comedones, erythematous papules and pustules, less frequently nodules, deep pustules or pseudocysts, and ultimate scarring in few of them. Acne has four main pathogenetic mechanism—increased sebum productions, follicular hyperkeratinization, Propionibacterium acne (*P. acne*) colonization, and

the products of inflammation. Among the essential elements, copper, zinc, iron and cobalt levels have been evaluated in acne patients. All these studies aimed at improved understanding of acne pathogenesis for better treatment results. Studies are particularly interested in zinc levels in acne patients. The vital role of this element was first published in 1963. The beneficial effects of zinc salts in mild and moderate acne lesions were also stated in studies.⁷⁻¹¹ Hence; under the light of above mentioned data, the present study was undertaken for assessing serum zinc levels in acne patients.

Mean age of the patients of the acne group and control group was 25.6 years and 23.1 years respectively. 80 percent of the patients of the acne group and 82 percent of the patients of the control group were females. Mean serum zinc levels among the patients of the acne group and control group was 83.12 µg/dL and 84.68 µg/dL respectively. Rostami Mogaddam M et al evaluated the serum zinc level in patients with acne vulgaris and compare it with healthy controls. One hundred patients with acne vulgaris and 100 healthy controls were referred to our clinic. Acne severity was classified according to Global Acne Grading System (GAGS). Atomic absorption spectrophotometry was used to measure serum zinc levels. Mean serum level of zinc in acne patients and controls was 81.31 ± 17.63 µg/dl and 82.63 ± 17.49 µg/dl, respectively. Although the mean serum zinc level was lower in acne group, it was not statistically significant ($P = 0.598$). There was a correlation between serum zinc levels with severity and type of acne lesions. The results of their study suggested that zinc levels may be related to the severity and type of acne lesions in patients with acne vulgaris.¹²

In the present study, while comparing statistically, non-significant results were obtained. Mean serum zinc levels among the patients with mild, moderate and severe acne were 89.23 µg/dL, 79.12 µg/dL and 72.36 µg/dL respectively. While comparing statistically, significant results were obtained. Amer M et al estimated serum zinc levels in acne patients and in matched healthy controls of both sexes and within the same age group. Women, whether diseased or healthy, have shown a significantly lower mean serum zinc level than the corresponding men. In advanced grades of acne, both men and women have a significantly lower level than the corresponding control groups. Within the same sex group, those with advanced grades have revealed a significantly lower level than those with slight grades.¹³ Arora PN et al studied serum zinc levels in 75 patients of different cutaneous disorders and 24 healthy controls. It was found to be significantly lower in acne vulgaris (71.5 ± 21.5 µgm/100ml), leprosy (85.9 ± 26.9 µgm/100ml) and psoriasis (93.3 ± 25.9 µgm/100ml) as compared to healthy controls (105.3 ± 30.1 µgm/100ml). No significant correlation was found in other cutaneous disorders studied i.e. vitiligo and aphthous ulcers where serum zinc levels were found to be 97.3 ± 26.6 µgm/100ml and 105.2 ± 23.5 µgm/100ml respectively.¹⁴

CONCLUSION

Serum zinc levels decrease significantly with increasing severity grades among acne patients.

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