

Serum zinc level in vitiligo: A case control study

Sir,

Vitiligo is a common dermatological disorder characterized by acquired, idiopathic, progressive, circumscribed hypomelanosis of the skin and hair, with total absence of melanocytes microscopically.^[1] Various physiological, biochemical, histochemical and enzymatic studies have been done to find out the cause of the disease.^[2]

Zinc impairs growth and development, decreases the resistance to local infection, delays wound healing, may produce hyperkeratotic skin lesions, apathy, depression, behavioral changes, and taste disturbances. Conditioned zinc deficiency occurs with the formation of insoluble complexes with calcium, fiber and phytate thus markedly decreasing the intestinal absorption of zinc. Decrease in plasma levels of zinc may occur in a woman on oral contraceptives, in pregnancy, cirrhosis of liver, viral hepatitis, parasitic infestations, acute infections, neoplastic conditions and myocardial infarction. Zinc deficient states were reported with steatorrhea, renal failure, severe burns and mongolism. Alcohol consumption may increase the urinary zinc levels.^[3]

Research at the molecular level has demonstrated deficiency of antioxidant substances in vitiliginous skin. This leads to cytotoxic action of reactive oxygen species such as superoxide anion and hydroxyl radical which are generated by the ultraviolet damaged epidermis. The free radicals are also cytotoxic to melanocytes and inhibit tyrosinase.^[2] Essentiality of zinc is related mainly to its function as the metal moiety of important enzymes. Zinc is considered as an antioxidant because

the extracellular enzyme superoxide dismutase is zinc-dependent. It plays a vital role in the protection against free radical damage. Zinc as a trace element, plays an important role in the process of melanogenesis. Trace elements including zinc catalyze the rearrangement of dopachrome to form 5,6 - dihydroxy indole - 2 carboxylic acid (DICA) in the process of melanogenesis.^[3] The present study was conducted to measure the serum zinc level across clinical spectrum of vitiligo and to compare it with age and sex-matched controls.

This study was conducted for a period of one and half years from January 2002. Sixty newly diagnosed patients of vitiligo who attended the dermatology OPD were included in the study. Patients who were not on any treatment with zinc in the four weeks prior to diagnosis were included in the study group. A detailed cutaneous and systemic examination was done in all patients and patients with other skin disorders or systemic diseases were excluded from the study group. The control group included normal volunteers who were not on zinc medication in any form. Three ml of fasting blood was collected in special sterile tubes (RIA vial) and was centrifuged for 10 minutes at 1500-2000 rpm. The supernatant serum was transferred to a separate sterile vial and kept at -20° C in the deep freezer till the analysis. All other routine investigations were done including hemogram, blood sugar, serum calcium and liver function tests. The serum zinc level was measured by 'atomic absorption spectrophotometer' (AAS). Normal range of serum zinc level is 11-19 mmol/l.

Of the 60 patients, 49 were males and 11 were females. Male to female ratio was 4.5:1. The mean age of presentation was 33.8 years and the mean age of onset was 29.2 years. The mean duration of the disease was 2 years. Only 33% of the patients had a positive family history. The most common site of involvement was found to be the lower extremity. Vitiligo vulgaris was the commonest morphological pattern (85%) followed by mucosal vitiligo (10%), segmental vitiligo (3.3%) and acrofacial vitiligo (1.6%).

Analysis of the zinc level revealed a reduced level in 13 (21.6%) out of the 60 patients. Eleven (22%) out of 49

male patients and two (18%) out of 11 female patients showed reduced zinc levels. Only one patient showed an elevated level of zinc for the age and sex. The serum zinc levels in the control group were within the normal range [Figure 1]. This difference between the two groups was statistically significant ($P < 0.0002$). The levels of serum zinc were low in the majority of the patients with duration of disease ranging from 2 to 5 years. Out of the 40 patients with mucosal involvement, 8 (20%) patients had reduced zinc levels.

Out of the 13 patients with reduced zinc levels, 6 patients had unstable vitiligo. Eleven out of 51 patients of vitiligo vulgaris and two out of six patients of mucosal vitiligo had shown reduced levels of zinc [Table 1]. Among patients with leukotrichia only one out of six showed reduced zinc levels. The levels were not reduced with acrofacial or segmental vitiligo.

An earlier study conducted at Pune did not reveal any significant correlation between zinc and vitiligo.^[5] However, the present study shows some interesting correlations between low zinc levels and vitiligo. Large-scale studies need to be conducted to confirm these findings and assess the effect of oral zinc supplements

in those patients with low zinc levels.

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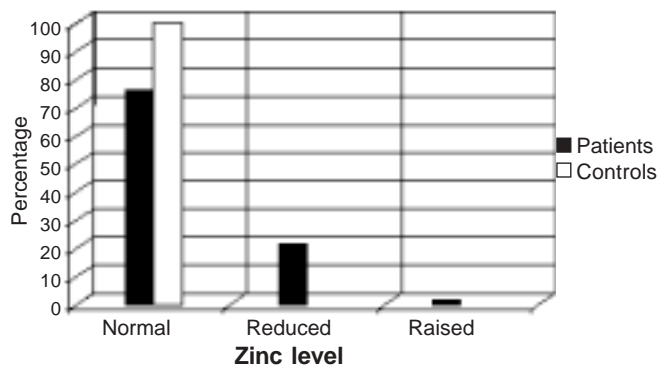


Figure 1: Serum Zinc level of patients in comparison with controls

Table 1. Chi-square test for serum zinc level on the basis of type of vitiligo

Type of Vitiligo	Normal	Reduced	Raised	Total	Chi-square	DF	P value
Vulgaris	39	11	1	51	1.49	6	0.95
Acrofacial	1	0	0	1			
Segmental	2	0	0	2			
Mucosal	4	2	0	6			

Key: DF – degrees of freedom