

ELEVATED LEVELS OF PLASMA CORTISOL IN PITYRIASIS VERSICOLOR

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Plasma cortisol levels were estimated in 49 patients having pityriasis versicolor and compared with the values obtained in 50 healthy controls and 23 patients (matched for age) with dermatological problems other than pityriasis versicolor. Only healthy patients with pityriasis versicolor, after exclusion of any systemic disease and history of drug intake, were taken for this study. Mean plasma cortisol levels in the patients with pityriasis versicolor ($38.43 \pm 25.27 \mu\text{g/dl}$) were significantly elevated as compared with normal controls ($18.8 \pm 3.16 \mu\text{g/dl}$) and dermatological patients with cutaneous pityriasis versicolor ($16.11 \pm 5.64 \mu\text{g/dl}$).

Key words : Pityriasis versicolor, Plasma cortisol.

Boardman and Malkinson,¹ Roberts,² and Savin and Noble³ reported that systemic corticosteroid therapy was associated with an increased susceptibility to infection with pityriasis versicolor. The generalised spread of superficial mycotic infection in patients with Cushing's syndrome is well documented.⁴⁻⁶ Koranda et al⁷ and Adams et al⁸ found an incidence of 18% and 11% for pityriasis versicolor infection respectively in their renal transplant patients on immunosuppressive drugs and corticosteroids. The reasons for such predisposition are not clear. The growth of *Pityrosporon orbiculare*, is not enhanced by the addition of corticosteroids to the culture media.⁹ Similarly, topical corticosteroids applied in conjunction with an inoculation of *P. orbiculare* to the normal skin do not increase the frequency of the development of tinea versicolor.⁹ It would thus appear, that the corticosteroids may act indirectly.

Pityriasis versicolor is basically a disease of healthy individuals, the reasons for its chronicity, persistence and recurrences are not fully understood. *P. orbiculare*, the causative fungus can be isolated from the skin of 90% normal individuals. Change in the morphology of

certain strains of *P. orbiculare* to mycelial forms does not explain all about the pathogenesis of the disease. Factors contributing to the morphological changes are probably varied and multiple.¹⁰

It was presumed that the elevated plasma cortisol levels in some patients may shift the host parasite relationship in favour of *P. orbiculare* when the factors of heat and humidity are appropriate, allowing the fungus to flourish. With this assumption, plasma cortisol was estimated in some patients having pityriasis versicolor.

Materials and Methods

Forty nine patients of either sex having pityriasis versicolor infection, irrespective of the extent, for at least two seasons were randomly selected. Essentially determined effort was made to take only healthy people with pityriasis versicolor infection, patients taking concomitant drugs or with any systemic disease were excluded.

Venous blood (2 ml) was drawn and the plasma cortisol level estimated using a radio-immunoassay following the WHO protocol of matched reagent assay programme. The blood samples were collected between 7-9 A.M.

Fifty healthy adults with matched ages formed the control group.

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Twenty three age-matched adults having trivial dermatological problems like molluscum contagiosum, plantar warts, corns and tinea unguium were also studied.

Results

There were twenty nine male and twenty female patients, their average age was 28.0 ± 9.7 years. The average age of the control group was 31.0 ± 9.7 years. The mean age of patients with dermatological problems other than pityriasis versicolor was 27.0 ± 6.9 years.

The mean plasma cortisol levels for the patients were 38.43 ± 25.27 , for the controls 18.8 ± 3.16 , and for the dermatological patients without pityriasis versicolor 16.11 ± 5.64 $\mu\text{g/dl}$ (Table I.)

Table I. Plasma cortisol levels in patients having pityriasis versicolor compared with the controls.

Group	Total number of cases	Mean age (Years)	Plasma cortisol levels ($\mu\text{g/dl}$)
Patients	49	28.0 ± 9.7	38.43 ± 25.27
Controls	50	31.0 ± 9.7	18.8 ± 3.16
Other dermatological patients	23	27.0 ± 6.9	16.11 ± 5.64

Comments

It is likely that most patients having pityriasis versicolor infection have a shift in the host/parasite relationship as regards this member of the autochthonous skin flora. Factors contributing to this change in the relationship are probably multiple,¹⁰ such as hot humid climate,²⁻¹¹ malnutrition, pregnancy, genetic predisposition^{2,9} and high plasma cortisol levels.^{1,2,9}

In the group of patients under report, the plasma cortisol levels were significantly higher in the patients as compared to the controls and patients with diseases other than pityriasis versicolor.

Burke⁹ cutaneously inoculated twenty patients having Cushing's disease with *P. orbiculare* and obtained a high incidence of takes. Patients on prolonged corticosteroid therapy have similar enhanced predisposition to the development of pityriasis versicolor.¹ Bilateral adrenalectomy caused spontaneous regression of the disease.⁹ Experimental studies indirectly involve corticosteroids in the appearance and spread of the disease. No alteration in the cutaneous free fatty acid patterns and sweat aminoacids have been documented in patients being treated with corticosteroids.¹ Some other mechanisms therefore seem to contribute to the predisposition to the disease. Sohnle and Collins-Lech¹² found impaired functions of effector lymphocytes in most patients with pityriasis versicolor. Corticosteroids are known to impede access of granulocytes to the inflammatory site, cause a transient lymphopenia, diminish bactericidal and fungicidal capacity of monocytes¹³ and decrease the responsiveness of lymphocytes to chemotactic factors. Corticosteroid administration may predispose to pityriasis versicolor infection by its effect on the lymphocytes.¹¹

Lorincz¹⁵ suggested that a diminished rate of physiologic desquamation of the stratum corneum may predispose to colonisation by *Malassezia furfur*, especially in patients with hypercorticism. Bullough¹⁶ has shown that cortisone has a marked depressent effect on mitosis in the epidermis of the mouse ear. However, the significance of the rate of desquamation and epidermal mitosis in relation to pityriasis versicolor still remains to be clarified. Further studies may sort out the relationship between elevated plasma cortisol levels and predisposition to infection with *P. orbiculare*.

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