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Serum retinol level in patients with Atopic dermatitis

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Abstract

Introduction: Atopic dermatitis (AD) is a common dermatological disorder causing significant morbidity and manifested by diffuse symmetrical eczematous eruption. The present study assessed serum retinol level in patients with Atopic dermatitis.

Materials & Methods: The present study was conducted on 74 cases of Atopic dermatitis of both genders. Equal number of control was also included. Serum retinol levels were assayed using a reversed-phase high-performance liquid chromatography (HPLC) method.

Results: Out of 74 subjects, males were 32 and females were 42. The mean retinol level in group I subjects was 51.6 ng/g and in group II was 172.3 ng/g. The difference was significant ($P < 0.05$).

Conclusion: Authors found that serum retinol level in patients of atopic dermatitis was significantly reduced as compared to healthy subjects.

Keywords: Atopic dermatitis, Retinol, Skin

Introduction

Atopic dermatitis (AD) is a common dermatological disorder causing significant morbidity and manifested by diffuse symmetrical eczematous eruption. There is characteristically a personal and/or family history of allergic syndromes of asthma or rhinitis. It usually occurs in infants and young children and affects the flexural aspects of the body^[1].

This skin disease is commonly associated with allergic rhinitis (hay fever or seasonal allergies) and asthma. This triad of conditions is collectively known as atopy, with affected individuals having a personal or family history of one or more of the three conditions. This word was first used in 1923 to define a domain of inherited hypersensitivity to environmental allergens, disparate from hypersensitivity and anaphylaxis to infection^[1]. It is commonly referred to by dermatologists as either AD or atopic eczema, and the terms can be used interchangeably^[2].

A diagnosis of AD is made clinically and is based on a personal or family history of atopy and clinical presentation of a chronic or relapsing pruritic dermatitis exhibiting typical morphology and age-specific patterns. Patients with acute flares present with erythematous, scaly lesions, and widespread excoriations. Papules and/or spongiotic vesicles are present in more severe cases. Dyspigmentation and lichenification are hallmarks of chronic disease. In darker skin types, the skin may have a grayish-white "ashy" appearance, and erythema may be difficult to see, whereas follicular accentuation, lichenification, and post-inflammatory dyspigmentation are more conspicuous^[3].

Retinol has important immunomodulatory effects. Furthermore, retinol is an effective antioxidant. Thus, monitoring retinol levels in serum and skin lesions of AD patients, as an indicator of the immune response and antioxidant defense could be important for the clinicians' treatment strategy^[4]. The present study assessed serum retinol level in patients with Atopic dermatitis.

Materials & Methods

The present study was conducted in the department of Dermatology. It comprised of 74 cases of Atopic dermatitis of both genders. Equal number of control was also included. All were informed regarding the study and written consent was obtained. The study protocol was approved by the Ethics Committee.

Data such as name, age, gender etc was recorded. Punch biopsy and venous blood sample were collected from each subject. Serum retinol levels were assayed using a reversed-phase

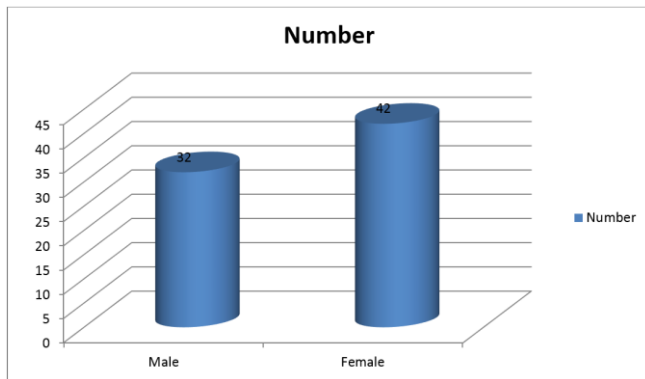
high-performance liquid chromatography (HPLC) method. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of subjects

Total- 74		
Gender	Male	Female
Number	32	42

Table I, graph I shows that out of 74 subjects, males were 32 and females were 42.

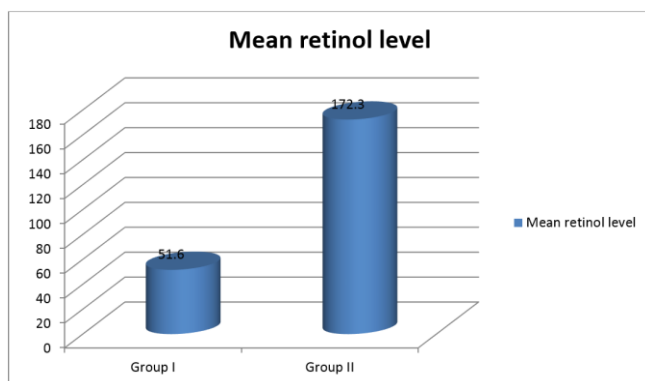


Graph I: Distribution of subjects

Table II: Retinol level in both groups

Groups	Mean retinol level	P value
Group I	51.6	0.001
Group II	172.3	

Table II, graph II shows that mean retinol level in group I subjects was 51.6 ng/g and in group II was 172.3 ng/g. The difference was significant ($P < 0.05$).



Graph II: Retinol level in both groups

Discussion

The lifetime prevalence of AD is estimated to be 10% to 30% in children and 2% to 10% in adults, with a two- or threefold increase over the past 3 decades in industrialized nations [5]. The International Study of Asthma and Allergies of Childhood has provided the most salient trends of AD across the world; AD in general is not increasing or has leveled off in countries with the highest prevalence. The younger children subpopulations and individuals in low-income countries are still experiencing an increased incidence of AD. Research studies documented that a higher

risk of AD development is associated with areas of industrialization, urbanization, and higher affluent class, whereas living in more tropical latitudes and rural areas are associated with lower risk of AD [5]. The present study assessed serum retinol level in patients with Atopic dermatitis.

In this study, out of 74 subjects, males were 32 and females were 42. Biswas *et al.* [6] evaluated the correlation of retinol levels in skin lesions and serum, with AD. Punch biopsy from the skin and venous blood of 86 participants (including 43 cases and 43 controls) were assayed for retinol levels by a reversed- phase high- performance liquid chromatography method. Skin and serum retinol levels were highly significantly decreased in patients in respect to that of controls.

We found that mean retinol level in group I subjects was 51.6 $\mu\text{mol/l}$ and in group II was 172.3 $\mu\text{mol/l}$. Retinol has a broad range of immunological effects. It inhibits IL-12 production from the antigen- presenting cells such as Langerhans cells, inflammatory dendritic epidermal cells, and macrophages; inhibits IFN- γ production from T and NK cells and decreases IgG levels [7]. It also inhibits IL-1 induced IL-6 production. Finally, it decreases TNF- α levels. All these effects of retinol may help to reduce the inflammatory process in chronic AD. The antioxidant property of retinol is well known. It has a very high chemical reactivity or scavenging activity toward lipoperoxyl radicals. Furthermore, there are synergistic interactions between all-trans-retinol and α -tocopherol against lipid peroxidation. Moreover, by limiting auto oxidation of all-trans-retinol, α -tocopherol strongly promotes its antioxidant effectiveness [8].

Topical corticosteroids (TCSs) are the mainstay of AD treatment for the management of mild to acute flares. Although the advent of newer therapies has allowed a decrease in the length of treatment with TCSs, they remain the first line in treatment. Current guidelines recommend the use of topical corticosteroids in patients with AD who have failed to respond to proper skin care and regular use of emollients alone [9]. Twice-daily application of TCSs for no longer than 2 weeks is generally recommended for the treatment of AD and should be applied only to affected sites because of the risk of local adverse effects, including striae, telangiectasia, generalized hypertrichosis, and skin atrophy. Long-term application of TCSs to the periorbital regions is associated with increased risk for cataracts and glaucoma; therefore, alternative topical therapies (e.g., topical calcineurin inhibitors and PDE4 inhibitors) should be considered for patients of all ages with periorbital involvement [10].

Conclusion

Authors found that serum retinol level in patients of atopic dermatitis was significantly reduced as compared to healthy subjects.

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