Plasma alpha-2-macroglobulin level in moderate to severe psoriasis

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Article Info

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Abstract

Psoriasis is a T-cell mediated chronic inflammatory diseases where pro-inflammatory mediators are involved in its pathogenesis. Alpha-2-macroglobulin (α-2M) is a panproteinase inhibitor having unique clearing role of different cytokines. This study was conducted on 30 patients with moderate to severe psoriasis to see the plasma level of α-2M and was compared with the normal healthy controls. Patients who were already selected for systemic treatment (methotrexate) and consented for routine blood test for monitoring at baseline and 12 weeks after treatment were enrolled along with 10 healthy controls. The venous blood (5 mL) was collected and the plasma alfa-2 macroglobulin was estimated using the enzyme-linked immunosorbent assay. The mean plasma α-2M level was 3.0 ± 0.4 g/L among the normal healthy persons, and 2.8 ± 0.7 g/L among the untreated patients of psoriasis ($p>0.05$). Its level among the patients with psoriasis after systemic antipsoriatic drugs was 2.8 ± 0.6 g/L which was not significantly different from the baseline level ($p>0.05$). The study shows that the plasma α-2M level in psoriasis is not different comparing with normal healthy persons.

Introduction

Psoriasis is a chronic inflammatory skin disease that affects 0.96 to 3% of different ethnic populations.[1-3] Total burden of this chronic disabling disease; its physical, social and psychological load justifies continuous research on pathogenesis and management of psoriasis. Psoriasis is a T cell mediated disease, associated with aberrant inflammation and the production of pro-inflammatory mediators including TNF-α, IL-17, IL-23, and other cytokines (IL-1α, IL-1β, IL-6, IL-15, IL-18 and IL-20).[4-7] Psoriasis is associated with a range of co-morbidities that include some chronic inflammatory conditions with overlapping pathology including rheumatoid arthritis, inflammatory bowel disease and other metabolic diseases.[8]

The α2 macroglobulin (α-2M) serving as a unique panproteinase inhibitor also involved in binding and the removal of cytokines support a balanced and properly functioning immune system in mammalian body.[9-11] It is a carrier of various cytokines and growth factors (e.g. IL-6, IL-1β, transforming growth factor-β, basic fibroblast growth factor, nerve growth factor) and many of these have some regulating role over T and B cells[12-13] So, the causal or beneficial role of this pan-proteinase in different inflammatory or autoimmune disease like psoriasis is needed to be explored which may open a new door in the treatment of these disease.

The current study was conducted to see the plasma concentration of alfa-2 macroglobulin among thirty patients with moderate to severe psoriasis who were already selected for treating with systemic treatment.

Materials and Methods

The study protocol was approved by the Institutional Review Board (IRB) of the University (BSMMU/2015/8200; Date 23/6/2015). The written consent was taken from each of the 30 patients of moderate to severe psoriasis who were already selected and consented for screening the blood test before systemic anti-psoriatic medication and 10 healthy adults.

The venous blood (5 mL) was collected and was sent to the Center for Advanced Biomedical Research of Bangabandhu Sheikh Mujib Medical University, where the plasma α-2M was estimated using the enzyme-linked immunosorbent assay (ELISA). Blood samples were also taken from all the patients with psoriasis after treatment with systemic drug as a part of their routine follow-up.

Data were analyzed for mean (M), median, Standard deviation, the mean error of the average (SEM) and variation coefficient (V%). Significance of differences between the averages was tested by the Student's t-test.

Table I

Distribution of patients of psoriasis by demographic variables

	Control (n = 10)	Patient (n = 30)
Mean age in year (range)	32.2 (17-70)	35.8 (15-67)
Age group		
<18 years	1	1
18–40 years	6	20
>40 years	3	9
Sex (Male: Female)	3:2	2:1

Table II

Distribution plasma alpha-2-macroglobulin level

	Control (n = 10)	Patients of psoriasis (n = 30)	
		Before treatment	After treatment
Alpha-2-macroglobulin (g/L)	3.0 ± 0.4	2.8 ± 0.7	2.8 ± 0.6

Results

In the current study, 20 psoriasis patients were from the age group of 18 to 40 years. The mean age among the psoriatics were 35.8 with a range 15-67 years. Male to female ratio of psoriatic patients were 2:1 (Table I). The mean of plasma level of alfa-2 macroglobulin (α-2M) was 3.0 ± 0.4 among normal healthy persons (control group), and 2.8 ± 0.7 among untreated patients of psoriasis ($p>0.05$) (Table II). Its level among patients with psoriasis after systemic antipsoriatic drugs was 2.8 ± 0.6 which was not significantly different from baseline level ($p>0.05$).

Discussion

Complex interactions between T cells, dendritic cells, keratinocytes, neutrophils and the pro-inflammatory cytokines produced by these cells contribute to the initiation and perpetuation of cutaneous inflammation characteristic of psoriasis.[14-15] A2M, a protease inhibitor having some clearing role on cytokines of tissue[9-15] We conducted the current study to see its serum level in psoriasis patients and compared with normal healthy controls. Globally only two previous studies have been conducted to see the alpha-2-macroglobulin activity in psoriasis.[16-17]

In both studies, the plasma A2M level is higher among people with psoriasis comparing with normal healthy controls and significantly got down after treatment with systemic medication.[15-16] On the contrary, its level in the psoriasis patients were not different from that of Bangladeshi normal healthy individuals and even not changed after systemic medication.

Conclusion

As only few studies have been carried out to see the activity of A2M in psoriasis and our findings are not consistent with previous findings we propose further large studies on this issue.

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