

SERUM PROTEINS, TRACE METALS AND PHOSPHATASES IN PSORIASIS

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Serum proteins, zinc, copper, acid phosphatase (AcPase), and alkaline phosphatase (ALPase) were studied in both active and remission phases of psoriasis. Data were compared with healthy controls. α_1 , β and γ globulins were high in active phase while α_1 and β globulins were at par in remission phase. Serum copper was low but zinc and alkaline phosphatase were significantly high in both active and remission phases of the disease. Acid phosphatase level was at par in all the experimental groups. Study suggest a positive correlation of globulin, zinc and AlPase in active and remission phase of psoriasis.

Key words : Psoriasis, Serum proteins, Phosphatases, Zinc, Copper

Introduction

Psoriasis is a chronic inflammatory disease, characterized by exacerbations and remissions. A large number of theories have been suggested to explain the aetiology of the disease. Present study includes comparative observations during active and remission phases of the disease which has not been studied earlier.

Materials and Methods

The study was carried out in 20 active psoriatic patients, 10 remitted psoriatic patients and 5 controls from October 1988 to January 1991.

Serum protein fractions were determined by the electrophoretic method of Verley.¹ Trace metals like Zn and Cu were estimated by atomic absorption spectrophotometrically following method of Fuwa et al.² Total serum AcPase and ALPase were estimated according to the method of

King and Jegathesan.³ Serum ALPase was estimated according to King and King.⁴

Results

The quantitative estimation of electrophoretically separated serum albumin (α) gave the value 3.98 ± 0.535 g/dl in healthy normals which showed decrease in active psoriasis (2.27 ± 0.986 g/dl) and in remitted psoriasis (2.45 ± 0.128 g/dl) cases. The data of active and remitted psoriasis were significantly low ($P < 0.001$) as compared to healthy normals. Between the active and remitted psoriasis difference was not significant. (Table I)

The mean serum α_1 globulin was almost equal among the healthy controls (0.49 ± 0.25 g/dl) and remitted (0.59 ± 0.25 g/dl) whereas in active psoriasis it is little above (0.74 ± 0.65 g/dl) the normal value (NS). There was no significant difference among the three treatments. Contrary to α globulin α_2 globulin was nonsignificantly high in active phase (1.06 ± 0.62 g/dl), in relation to controls (0.89 ± 0.25 g/dl), and remitted phase (0.84 ± 0.1 g/dl). The β globulin showed significant ($P < 0.001$) increase in active phase (1.45

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0.71 g/dl) as well as in remitted phase (1.89 ± 0.21 g/dl) of the disease as compared to controls (0.68 ± 0.46 g/dl). A significant (P<0.001) increase of globulin was noted in active phase (2.36 ± 0.95 g/dl) over controls but not in remitted phase (1.48 ± 0.29 g/dl).

Serum Cu was found low in both active phase (75.0 ± 34.12 ug/dl) and remitted phase (75.00 ± 26.35 ug/dl) than the control patients (95.0 ± 14.31 ug/dl). The differences were significant (P<0.05). Contrary to serum copper level Zn was high in active (125.00 ± 25.65 ug/dl) and in remitted phase (120.10 ± 25.82 ug/dl), as compared to control (105.40 ± 21.49 ug/dl). Difference in two group was significant (P<0.02). The mean Cu/Zn ratio was low in active (0.61 ± 0.27 ug/dl) and remitted (0.64 ± 0.26 ug/dl) phase as compared to control (0.90 ± 0.17 ug/dl). The differences were significant statistically (P<0.001.) (Table II)

The mean value of serum AcPase in controls was (2.27 ± 0.53 KAU/dl). No

significant variation was observed in active (2.92 ± 2.01 KAU/dl) and remitted phase (2.12 ± 0.60 KAU/dl) as compared to controls. Serum AIPase was high in both active (12.99 ± 5.79 KAU/dl), and remitted phase (8.48 ± 1.61 KAU/dl). The difference was significant statistically (P<0.001 and 0.05 respectively)

Comments

Electrophoretic separation of serum proteins in active and remitted psoriasis presented a variable pattern of α, α₂, β and γ globulin fractions, which differ from the pattern reported earlier in active psoriatic phase of the disease.^{5,6} A little higher α₂ globulin but significantly higher γ and β globulin in active phase as compared to the remitted phase and controls is a significant observation. Change in globulin level has been implicated with the increase in iron deficiency which is evident by significant decrease in haemoglobin content in active phase as compared to remitted phase and

Table I: The mean values of serum proteins separated electrophoretically in active, remitted psoriasis cases and in healthy normals.

Groups of cases examined in both sexes		Serum proteins g/dl				
		α	α ₁	α ₂	β	γ
Normal (F=5, M=15)	Range	2.59 - 4.77	0.16 - 0.94	0.54 - 1.62	0.21 - 1.95	0.84 - 1.72
	Mean±S.D.	3.98 ± 0.535	0.49 ± 0.257	0.89 ± 0.254	0.68 ± 0.468	1.24 ± 0.229
Active psoriasis (F=4, M=16)	Range	0.87 - 4.64	0.17 - 2.99	0.28 - 3.29	0.27 - 3.13	1.49 - 5.71
	Mean±S.D.	2.27 ± 0.986	0.74 ± 0.656	1.06 ± 0.626	1.45 ± 0.710	2.36 ± 0.954
		0.001	N.S.	N.S.	0.001	0.001
Remitted psoriasis (F=4, M=16)	Range	2.23 - 2.60	0.16 - 0.92	0.66 - 1.12	1.61 - 2.25	1.24 - 1.99
	Mean±S.D.	2.45 ± 0.128	0.59 ± 0.259	0.84 ± 0.166	1.89 ± 0.217	1.48 ± 0.297
		0.001	N.S.	N.S.	0.001	0.02

F = Female

M = Male

Table II. The mean values of serum copper, zinc and phosphatases in active remitted psoriasis cases and in healthy normals.

Groups		Cu ug/dl	Zn ug/dl	Cu/Zn ratio	AcPase KAU/dl	AlPase KAU/dl
Normal	Range	80 - 125	74 - 130	0.64 - 1.25	1.6 - 3.0	4.5 - 11.0
	Mean±S.D.	93.05 ± 14.314	105.40 ± 21.495	0.90 ± 0.170	2.27 ± 0.537	8.48 ± 1.616
		(F=5, M=15)	(F=5, M=15)	(F=5, M=15)	(F=2, M=8)	(F=6, M=14)
Active Psoriasis	Range	50 - 150	100 - 150	0.33 - 1.00	0.8 - 7.3	6.0 - 19.0
	Mean±S.D.	75.00 ± 34.412	125.00 ± 25.650	0.61 ± 0.277	2.92 ± 2.015	12.99 ± 5.795
		0.05 (F=4, M=16)	0.02 (F=4, M=16)	0.001 (F=4, M=16)	N.S. (F=4, M=12)	0.001 (F=4, M=12)
Remitted Psoriasis	Range	50 - 100	100 - 150	0.33 - 1.00	1.3 - 2.7	6.5 - 28.7
	Mean±S.D.	75.00 ± 26.352	120.00 ± 25.820	0.64 ± 0.216	2.12 ± 0.603	12.49 ± 7.303
		0.05 (F=3, M=7)	N.S. (F=3, M=7)	0.001 (F=3, M=7)	N.S. (F=4, M=6)	0.05 (F=4, M=6)

F = Female

M = Male

controls in our study reported elsewhere.⁷ High globulin in active phase of the disease but not the remitted phase indicate possibility of chronic infection.⁷ This observation is further supported by high lymphocyte count during active phase of the disease.⁷

Importance of trace metals like Cu and Zn in psoriasis was accepted by large number of workers.⁸⁻¹⁰ Both elements are known to influence each other metabolically, through competition for binding sites in the protein molecule of enzyme. A positive relationship appears between high Zn but low Cu level with high AlPase in both active and remitted phase of psoriasis as compared to the controls. Although it is not possible to explain what role Zn and AlPase might be playing, but their involvement in angiogenesis in psoriasis skin can not be ruled out.

This study suggests that globulin, Zn and AlPase are the variable factors during active to remission phase of psoriasis.

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