Significance of adenosine deaminase (ADA)-lactate dehydrogenase(LDH) and uric acid levels in psoriasis

Shaikh Mahmood

Assistant Professor, Dept. of Physiology, Deccan College of Medical Sciences, Owaisi Hospital & Research Centre, Hyderabad, Telengana State, India

***Corresponding Author: Shaikh Mahmood**
Email: mahmood_shaikh2001@yahoo.co.in

Abstract
Psoriasis is a most common and chronic genetic disease. There is high inflammation and proliferation of the skin. Due to this disease the skin becomes demarcated dull red, scaly plaques. It distributed particularly on the extensor prominences of the body and also in the scalp. There are several factors involved in the etiopathogenesis of psoriasis are genetic factors, metabolic factors, and immunological factors. The genetic mutations, body metabolism and the immune disorders of the body can cause elevation of adenosine deaminase (ADA), lactate dehydrogenase (LDH) and uric acid levels. Psoriasis is common chronic inflammatory skin disease with a spectrum of clinical phenotype and results from interplay of genetic environments and immunological factors. Psoriasis is dynamic disease, morphological changes accompany the evolution of a newly formed lesion into an advanced plaque that can slowly enlarge or remain static.

Keywords: Psoriasis ,Genetic Factors, Metabolic factors, Immunological Factors, Mutations for Adenosine Deaminase (ADA), Lactate Dehydrogenase(LDH), Uric Acid.

Introduction
Psoriasis is one 0f the commonest skin disorder. Psoriasis is genetic, metabolic and autoimmune condition. It is a chronic skin disease that affects 2 – 4 percent of the population. Psoriasis can develop at any age, it commonly appears between the age of 15 and 22 years. The second peak may appears during 60 – 70 years of age group. Females are more early affected than male. Psoriasis is an inflammatory skin disease that typically follows a relapsing and remitting course. Plaque psoriasis is characterized by well delineated red, scaly plaque that may extend from a few patches to generalized involvement. Psoriasis is common chronic inflammatory skin disease with a spectrum of clinical phenotype and results from interplay of genetic environments and immunological factors. Psoriasis is dynamic disease, morphological changes accompany the evolution of a newly formed lesion into an advanced plaque that can slowly enlarge or remain static.

Materials and Methods
This study was done at Owaisi Hospital & Research Centre(a teaching hospital to Deccan College of Medical Sciences, Hyderabad,500058 Telangana State, India. A total number of 50(fifty) patients suffering from psoriasis were selected from out patients of Department of Dermatology at Owaisi Hospital & Research Centre(a teaching hospital to Deccan College of Medical Sciences, Hyderabad,500058 Telangana State, India. This was confirmed clinically and skin biopsy. This disease is effected both males and females within the age group of 18- 70 years. A total number of 100(hundred) individual without any history of any kind of skin disease were selected as healthy controls.Their serum Adenosine Deaminase (ADA), Lactate Dehydrogenase(LDH) and serum Uric Acid parameters were measured in Cobas 311 clinical chemistry analyzer at Biochemistry Laboratory, deaptment of Biochemistry at Owaisi Hospital & Research Centre(a teaching hospital to Deccan College of Medical Sciences, Hyderabad,500058 Telangana State, India.

Table 1: Demographic data of the studied groups

Demographic	Controls(100)	Mild(10)	Moderate(20)	Severe(20)	p
Age(Years)					
Median	28.5(18 – 70)	32.5(15 – 65)	31(20 – 30)	31(20 – 30)	0.199*
(Minimum – Maximum)					
Sex					
Female (%)	12(60)	16(80)	14(70)	11(55)	0.348**

Male (%)	8(40)	4(20)	6(30)	9(45)	

*Kruskal – Wallis Test, ** Chi – Square Test

Table 2: Comparison of Parameters in Psoriasis Patients and Controls

Parameters	Psoriasis		Patients	Controls	p value
	Mean	SD	Mean	SD	
ADA (U/L	55.20	22.34	17.43	8.13	<0.001
LDH (U/L)	450.25	225.12	280.50	140.50	<0.001
Uric Acid (mg/dl)	12.50	6.25	7.50	3.75	<0.001

Results

The psoriasis group (n=50) included 25 females and 25 males with a mean age of 44.0 _+ 10.52 years (range 18 – 70 years). The control group (n+100) considered of 50 females and 50 males subjects with a mean age of 41.72 _+ 8.82 years range is 25.65 years. The comparison of the serum Adinosine Deaminase (ADA), Lactate Dehydrogenase(LDH) and Uric Acid levels were done between psoriasis patients and healthy controls. There is significant high values were found in patients of psoriasis.

Discussion

The Psoriasis patients have significantly high serum Adenosine Deaminase (ADA) with mean value 55.20 U/L compared to healthy controls Adenosine deaminase(ADA) with mean value 15.34 U/L (p value <0.001 highly significant). The Psoriasis patients have significantly high serum Lactate Dehydrogenase (LDH) with mean value 450.25 U/L compared to healthy controls Lactate Dehydrogenase(LDH) with mean value 225.12 U/L (p value <0.001 highly significant) The Psoriasis patients have significantly high serum Uric acid with mean value 12.50 mg/dl compared to healthy controls with mean value 7.50 mg/dl (p value <0.001 highly significant).

Conclusion

The Adenosine Deaminase(ADA) is implicated in the pathogenesis of psoriasis . This is due to T Lymphocytes activation and proliferation. This increase in Adenosine Deaminase(ADA) will result in involved T Lymphocyte activation and proliferation leading to increased severity of psoriasis. Although The Adenosine Deaminase(ADA) plays an important role in the genetics of psoriasis. The serum Lactate Dehydrogenase (LDH) among the serum Lactate Dehydrogenase (LDH) isoenzymes were more prominent in psoriasis.

The serum Lactate Dehydrogenase (LDH) was useful as a marker for the evaluating the disease condition and severity of psoriasis. The increased Uric Acid levels are due to increase epidermal turn over in psoriasis which leads to increase in purine catabolism. The increase epidermal turn over in psoriasis is due to hyperproiferation of epidermis. There is proportional increase in serum Uric Acid levels with increasing serum Adenosine Deaminase(ADA) and The serum Lactate Dehydrogenase (LDH).

Source of funding

None.

Conflict of interest

None.

References

1. Adams A, Harkness RA. Adenosine deaminase activity in thymus and other human tissues. *Clin Exp Immunol* 1976;26(3):647.
2. Zidek Z. Adenosine - cyclic AMP pathways and cytokine expression. Eur Cytokine Netw. 1999;10(3):319–28.
3. Baker BS, Fry L. The immunology of psoriasis. *Br J Dermatol* 1992;126(1):1–9.
4. Koizumi H, Ohkawara A. Adenosine deaminase activity in sera of patients with psoriasis, mycosis fungoides and adult T cell leukemia. *Acta Derm Venereol* 1992;72(6):410–2.
5. Bukulmez G, Akan T, Ciliv G. Serum adenosine deaminase levels in patients with psoriasis: a prospective case-control study. *Eur J Dermatol* 2000;10(4):274–6
6. Isha, Jain VK, Lal H. C-reactive protein and uric Acid levels in patients with psoriasis. *Indian J Clin Biochem* 2011;26(3):309–11.
7. Brenner W, Gschnait F. Serum uric acid levels in untreated and PUVA-treated patients with psoriasis. *Dermatol* 1978;157(2):91–5.
8. Strober B, Teller C, Yamauchi P. Effects of etanercept on C-reactive protein levels in psoriasis and psoriatic arthritis. *Br J Dermatol* 2008;159(200):322–30.
9. Kwon HH, Kwon IH, Choi JW, Youn JI. Cross-sectional study on the correlation of serum uric acid with disease severity in Korean patients with psoriasis. *Clin Exp Dermatol* 2011;36(5):473–8.
10. das S, Biswas UK, Kumar A, Roy A. Study of serum carbonic anhydrase activity, uric acid, C-reactive protein levels and lipid parameters in patients with Psoriasis. *Nepal J Dermatol, Venereol Leprol* 2013;11(1):20–7.
11. Giusti G, Galanti B. Colorimetric method. Methods of enzymatic analysis. *Weinheim Verlag Chemie* 1984:315–23.

12. Woodley DT, Kim GH. Potential new insight into the pathogenesis of psoriasis. *Arch Dermatol* 2009;145(6):713–4.
13. Vlcek F, Mikulíková D. The effect of methotrexate on activity of T-lymphocyte marker enzymes in patients with psoriasis vulgaris. *Bratisl Lek Listy* 1995;96(3):137–40.
14. Köse K, Utaş S, Yazici C, Akdaş A, Keleştimur F. Effect of propylthiouracil on adenosine deaminase activity and thyroid function in patients with psoriasis. *Br J Dermatol* 2001;144(6):1121–6.
15. Iizuka H, Koizumi H, Kimura T, Miura Y. Adenosine deaminase activity in peripheral lymphocytes of psoriasis and Sézary's syndrome. *J Dermatol* 1980;7(3):165–9.
16. Erbagci Z, Erbagci AB, Köylüoglu O, Tuncel AA. Serum adenosine deaminase activity in monitoring disease activity and response to therapy in severe psoriasis. *Acta Med* 2006;49(2):101.
17. Chand R, Reddy BS, Sehgal VN, Datta P. Serum Uric Acid Calcium and Phosphorus in Psoriasis. *Indian J Dermatol Venereol Leprol* 1983;49(4):150.
18. Lambert JR, Wright V. Serum uric acid levels in psoriatic arthritis. *Ann Rheum Dis* 1977;36(3):264–267.
19. Scott JT, Stodell MA. Purine Metabolism in Man-I.V. US: Springer. Serum uric acid levels in psoriasis; 1984;283–285.
20. Steel DM, Whitehead AS. The major acute phase reactants: C-reactive protein, serum amyloid P component and serum amyloid A protein. *Immunol Today* 1994;15(2):81–8.
21. Baumann H, Gauldie J. The acute phase response. *Immunol Today* 1994;15(2):74–80.
22. Sergeant A, Makrygeorgou A, Chan WC, Thorrat A, Burden D. C-reactive protein in psoriasis. *Br J Dermatol* 2008;158(2):417–9.
23. Taheri Sarvtin M, Hedayati MT, Shokohi T, Hajheydari Z. Serum lipids and lipoproteins in patients with psoriasis. Arch Iran Med. 2014;17(5):343.
24. Nemati H, Khodarahmi R, Rahmani A, Ebrahimi A, Amani M, Eftekhari K. Serum lipid profile in psoriatic patients: correlation between vascular adhesion protein 1 and lipoprotein (a). *Cell Biochem Funct* 2013;31(1):36–40.
25. Asha K, Singal A, Sharma SB, Arora VK, Aggarwal A, Dyslipidaemia AA et al. Dyslipidaemia & oxidative stress in patients of psoriasis: Emerging cardiovascular risk factors. *Indian J Med Res* 2017;146(6):708.
26. Amer M, Galal A, Amer A. Psoriasis Severity is affected by T the Lipid Profile in Egyptian Patients. *Gynecol Obstet* 2015;5(346):2161–32.
27. Javidi Z, Meibodi NT, Nahidi Y. Serum lipids abnormalities and psoriasis. *Indian J Dermatol* 2007;52(2):89.
28. Rocha-Pereira P, Santos-Silva A, Rebelo I, Figueiredo A, Quintanilha A, Teixeira F et al. Dislipidemia and oxidative stress in mild and in severe psoriasis as a risk for cardiovascular disease. *Clin Chim Acta* 2001;303(1-2):33–39.
29. Uyanik BS, Ari Z, Onur E, Gündüz K, Tanülkü S, Durkan K et al. Serum lipids and apolipoproteins in patients with psoriasis. *Clin Chem Lab Med* 2002;40(1):65–8.

How to cite: Mahmood S. Significance of adenosine deaminase (ADA)-lactate dehydrogenase(LDH) and uric acid levels in psoriasis. *IP Int J Aesthet Health Rejuvenation* 2020;3(1):13-5.