A Hospital Based Crosssectional Study on Early and Late onset Psoriatic Patients

Deepthi E[1], Vijayakumar S*[1] and Ramchander D[2]

[1]Department of Pharmacy Practice, MGM Hospital, Warangal, A.P

[2]Department of Dermatologist, MGM Hosptial / KMC, A.P

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ABSTRACT

Psoriasis is a common, chronic disfiguring inflammatory disease of the skin characterized in most cases by well defined scaly, red and indurate plaques mainly over extensor surfaces but also often involving other areas of the body. Although there are several studies investigating oxidant/antioxidant systems and lipid profile in psoriatic patients, the data obtained from these studies is not concordant. In this study, Malondialdehyde (MDA), Glutathione (GSH), Total antioxidant status (TAS) in fourty patients with psoriasis were investigated and compared with those of forty Control subjects. Clinical severity of the disease was determined according to the Psoriasis Area and Severity Index (PASI) scores in the patients. Plasma MDA levels were significantly higher (p= 0.0119) whereas TAS and GSH levels were lower, in patients than control subjects (p= 0.0001 and p= 0.0001 respectively). There was no correlation between PASI scores and plasma MDA, GSH, TAS levels. Our findings may provide some evidence for a potential role of increased ROS production and decreased antioxidant activity in psoriasis. Whereas, serum Albumin and Calcium levels in psoriatic patients were found to be lower than control subjects

INTRODUCTION

Psoriasis is a common, chronic inflammatory skin disease with unknown etiology.[1,2] ROS that originate in the environment and skin may damage cell compounds such as protein, lipid and DNA. A complex of human antioxidant enzymes catalyses the reaction of ROS scavenging these are glutathione peroxidase, total antioxidant status, catalase, superoxide desmutase. Studies on antioxidant enzyme activity demonstrate the participation of ROS in tissue lesion processes esp., in chronic inflammatory process results in increased lipid peroxidation and formation of MDA.[3] Our present study is to investigate different parameters in early and late onset psoriatic patients.

MATERIALS AND METHODS

This cross sectional study is carried out at tertiary care hospital from December 2010 to October 2011 data was collected from Dermatology unit at Mahatma Gandhi Memorial Hospital (MGMH) Warangal, India. This dermatology unit has inpatient and outpatient clinic. During the study period all the patients with clinical diagnosis of psoriasis were included, in case of uncertain diagnosis or incomplete information were excluded. The research and ethical committee of concerned hospital approved the studied. The participating clinical pharmacist were asked to fill a specially designed pre-tested questionnaire about all psoriatic patients includes sex, age, onset of psoriasis, family history, history of nail-joint involvement, clinical signs and severity of psoriasis and clinical site involvement, involved and uninvolved area of the skin (nail, genital area, scrotum). Severity of psoriasis was estimated by PASI (psoriasis area severity index). The clinical signs of nail involvement in psoriasis pitting, onycholysis, oil drop sign, and hyperkeratosis were also reported in the studied.

Data were analyzed and managed using Graph pad prism version 5. Blood samples of case and control group were drawn into EDTA vials and centrifuged for about 20 to 30 min at 3000 rpm and plasma samples were stored at -20ºc until analysis. The amount of lipid peroxidation produced in the serum/plasma samples were estimated by the thiobarbituric acid reactive substances (TBARS) method carbonueau *et al*; by spectrophotometrically at 532nm. The results were presented in nanomoles of MDA per ml of serum/plasma. Glutathione forms a light yellow colored complex with DTNB 5-5[1](dithiobis-2-nitrobenzoic acid) which is measured spectrophotometrically at 412nm (George ellman; 1959; Beultar *et al*; 1963). The results were presented in µmole of glutathione per ml of serum/plasma. Total anti-oxidant status was estimated by using DPPH (∞, ∞-diphenyl β –picryl hydrazyl) at the concentration of 0.2Mm in methanol, whose

Address for Correspondence:

Pravinkumar V. Ingle, Assistant Professor, Department of Clinical Pharmacy, R. C. Patel Institute of Pharmaceutical Education & Research, Shirpur-425405, Dist: Dhule, Maharashtra, India.

E-mail: prabhu4ever2000@rediffmail.com

absorbance was read at 517nm (Blios 1958, Kalpana *et al;* 2001). The results were presented in terms of nmole of ascorbic acid. Calcium forms a purple colored complex with o-cresolphthalein complexone whose intensity is measured by spectrophotometrically at 570nm. The results were expressed in terms of mg/dl. Albumin forms green color complex with BCG (bromo cresol green) whose absorbance is measured at 630nm spectrophotometrically. The results were expressed in terms of gm% of albumin. Lipid profile was estimated by using chemical kits.

RESULTS

Among 40 patients 22 (55%) were male and 18 (45%) female. The mean age of the patients was found to be 43.05±17.7 years (SEM=2.79) with a range of 7-70yrs. The mean age of controls was 43.93±17.52 years (SEM=2.77), out of which 23(57.5%) were male and 17(42.5%) female. There was no significant difference in the mean age between gender. Majority of the patients were in age groups of 40-50 years. The results of the plasma level of lipid profile, serum albumin and calcium in psoriatic patients and healthy controls are summarized in table 1. Statistically increased level of lipid profile was noted on psoriatic patients; whereas serum albumin and calcium levels were statistically lower than control group. The mean serum values of MDA, GSH, and TAS in psoriatic patients and control group were summarized in table 2. Statistically increased levels of MDA in psoriatic patients were noted. Among different signs of nail involvement (pitting, onycholysis, hyperkeratosis, and oil drop sign) in majority of 19 patients (47.5%) pitting is the commonest sign reported in psoriatic patients as shown in table 3. Results of the present study shows the type of psoriasis in our study population as shown in table 4.

Table 1: Metabolic parameters in Control Vs Case

Parameter (Normal Range)	Control	P-value
TGS (50-150 mg/dl)	118.3±4.407	186.7±10.34****
VLDL (6-40 mg/dl)	23.15±0.86	37.32±2.0****
LDL (0-100 mg/dl)	49.74±3.0	102.8±6.6****
HDL (40-60 mg/dl)	50.13±1.3	35.10±1.7***
TC (<200 mg/dl)	122.9±3.08	173.6±7.22****
SERUM ALBUMIN (3.7-5.3gm %)	4.639±0.06	4.341±0.1003*
SERUM CALCIUM (8.7-11mg/dl)	9.629±0.11	7.963±0.197***

Table 2: Oxidative stress and Antioxidant status in Control Vs Case

Variable	Control n=40	Case n=40	'P' Value
MDA (nmole/ml)	15.48±1.001	41.73±0.66	<0.05
GSH (µmole/ml)	12.47±0.78	8.181±0.37	
TAS (µmole/ml)	37.35±2.46	17.09±0.73	

Table 3: Clinical signs of nail involvement in psoriatic patients

Clinical Signs of Nail Involvement	Number of Patients
Pitting	19
Onycholysis	11
Hyperkeratosis	3
Oil drop sign	7

Table 4: Types of psoriasis in our study population

Type Of Psoriasis	Male	Female
Generalized erythematous	12	5
Chronic plaque psoriasis	4	7
Plantar psoriasis	0	3
Palmar psoriasis	0	2
Palmoplantar psoriasis	1	3
Scalp psoriasis	0	1
Psoriatic arthritis	0	1
Pustular psoriasis	1	0

DISCUSSION

Psoriasis is characterized by T-cell activation that releases proinflammatory cytokines such as TNF-∞ , leading to keratinocytes proliferation and the typical skin lesions of psoriasis. The conventional approach to psoriasis consists of utilizing topical and/or oral corticosteroids, other immunosuppressant drugs, oral retinoids, UV light and several biological agents. Although these treatments can be highly effective at controlling the disease, none are universally safe and effective and each carries a considerable risk profile.

There is some evidence for the use of dietary modification and fish oil to decrease inflammation in psoriasis. More research is warranted to clarify the use of these and various topical botanical therapies and lifestyle modifications for improving clinical symptoms, decreasing the phenotypic expression of psoriasis, and providing safe and effective treatments Michael traub *et al.,* 2007.[4]

Our present study reports that there is no significant difference in age related phenotypic difference as similar to multicenter cross sectional study reported by Amer ejaz *et al*., 2009[5]. Inadequate antioxidant protection or excess reactive oxygen species (ROS) production creates a condition known as oxidative stress, contributing to the development of cutaneous diseases and disorders Trouba KJ *et al.,* 2002[6],

Maccarrone *et al.,* 1997. Over production of ROS because of chronic inflammatory and decreased activity of antioxidants may play a significant role in the pathogenesis of psoriasis and probably in the increased risk of cardiovascular disorders in psoriatic patients, Increased ROS levels are reflected by higher plasma MDA levels and decreased anti-oxidant activity determined by AOP (anti-oxidant potential) levels on patients with psoriasis, independent from the severity of disease as expressed by PASI score is reported by Baz K *et al.,* 2003.[7] ROS produced during the inflammatory process in psoriasis may result in increased lipid peroxidation; this process may lead to cell damage. It's also responsible for a decrease in the cAMP / cGMP ratio leading to epidermal hyperproliferation Papor *et al*., 1991, Raynaud F *et al.,* 1997[8], Briqanti S *et al.,* 2003[9]. However Yildrim *et al.,* 2003 didn't detect any difference in serum MDA levels in psoriatic patients compared to controls. Our data showed that reduced high density lipoproteins (HDL) levels and increased triglycerides (TG's), total cholesterol (TC), very low density lipoproteins (VLDL), and low density lipoproteins (LDL), levels in psoriatic patients are similar to the results reported by Hamid A *etal.,* 2009[10] and Akhyani M *et al.,* 2007.[11] The severity of psoriasis is calculated by PASI score. Although score gives a fair assessment of disease severity as reported by Amer ejaz *et al.,* 2009[5], our present study also complies with the author.

Nail changes in psoriatic patients is reported in present study. We could elicit nail changes in psoriasis have been reported upto 2/3rd of the patients[12, 13]**.** A limitation of the study was positive correlation between nail and joint involvement has been found by many authors[14]; in the present study we have not seen an overall positive correlation between nail and joint.

Generalized psoriasis was commonest clinical type seen in psoriatic patients which is in contrast to the earlier reports[15,16] no significant relationship could be established between the age of onset and clinical forms of disease.[17,18] This finding is concordance with earlier studies.

To the best of our knowledge, our study is first to report serum albumin and calcium levels and first to report clinical signs of nail involvement in psoriatic patients.

CONCLUSION

This study finding suggests that decreased calcium, albumin levels and antioxidant capacity may be involved in the pathogenesis of psoriasis. Furthermore, this work strengthens the association between number of patients, antioxidant supplementation, periodical lipid profile check up, pharmacogenomic studies and innovation of newer molecule for the treatment of psoriasis.

REFERENCES

1. Baker BS, FryL. The immunology of psoriasis. Br J Dermatol 1992; 126:1-9.
2. Ortonne JP. Recent developments in the understanding of the pathogenesis of psoriasis. Iranian J of Dermatology 1999; 140:1-7.
3. Soheli Nasiri *et al* .Interplay among anti oxidants and oxidants in psoriasis. Iranian J of Dermatology 2009; 12:56-9.
4. Michael Traub *et al*. Alternative Medicine Review Pathophysiology, Conventional, and Alternative Approaches to Treatment 2007; 12:319-30.
5. Amer Ejaz. Presentation of early onset psoriasis in comparision with late onset psoriasis: A clinical study from Pakistan. Indian J Dermatol Venereol Leprol 2009; 75:36-40.
6. Trouba KJ, Hamadeh HK, Amin RP, Germolec DR. Oxidative stress and its role in skin disease. Antioxid Redox Signal 2002; 4:665-73.
7. Baz K, Cimen MY, Kokturk A. Oxidant/antioxidant status in patients with psoriasis. Med J 2003; 30:987-90.
8. Briqanti S, Picardo M. Antioxidant activity, lipid peroxidation and skin diseases. What's new? J Eur Acad Dermatol Venereol 2003; 17:663-9.
9. Raynaud F, Evain-Brion D, Gerbaud P. Oxidative modulation of cyclic AMP-dependent protein kinase in human fibroblasts: possible role in psoriasis. Free Radic Biol Med 1997; 22:623-32.
10. Akhyani M, Ehsani AH, Robati RM, Robati AM. The lipid profile in psoriasis:a controlled study. J Eur Acad Dermatol Venereol 2007; 21:1330-2.
11. Amina HAA. Biochemical changes in psoriasis. The Middle East journal of internal medicine 2010; 3.
12. Sadek HA, Abdel-Nasser AM, El-Amawy TA, Hassan SZ. Rheumatic manifestations of psoriasis. Clin Rheumatol 2007; 24:488-98.
13. Al-Mutairi N, Manchanda Y, Nour-Eldin O. Nail changes in childhood psoriasis: A study from Kuwait. Pediatr Dermatol 2007; 24:7-10.
14. Serarslan G, Gular H, Karazincir S. The relationship between nail and distal phalangeal bone involvement severity in patients with psoriasis. Clin Rheumatol 2007; 26:1245-7.
15. Siow KY, Safder NA, Chong KH, Chua KB. A clinical appraisal of patients with psoriasis treated in Seremban General Hospital, Malaysia. Med J Malaysia 2004; 59:330-4.
16. Kaur I, Handa S, Kumar B. Natural history of psoriasis: A study from the subcontinent. J Dermatol 1997; 24:230-4.

17. Ferrandiz C, Pujot R, Garcia-Patos V, Bordas X, Smandia JA. Psoriasis of early and late on set: A clinical and epidemiologic study from spain. J Am Acad Dermatol 2002;46:867-73.

18. Fan X, Yang S, Sun LD, Liang YH, Goa M, Zhang KY, *et al*. Comparision of clinical features of HLA-CW*0602-positive and negative psoriasis patients in a Han Chinese population. Acta Dermatol Venerol 2007; 87:335-40.