



**STUDY OF CARDIOVASCULAR FINDINGS IN PSORIASIS PATIENTS – A STUDY AT
TERTIARY CARE CENTRE**

**Dr. Sambaraju Vallala¹, *Dr. Sudha Rani Chintagunta², Dr. Geetakiran Arakkal³, Dr. Sathaiah Sadhumalla⁴,
Dr. Bhavya Sindhu Jayanthi⁵ and Dr. Sai Krishna Nagula⁶**

¹Civil Assistant Surgeon, Kakatiya Medical College, Warangal.

²Associate Professor, Department of DVL, Govt Medical College, Nizamabad, Telangana state.

³Professor, Dept. of DVL, Gandhi Medical College, Hyderabad.

^{4,5,6}Post Graduate, Dept of DVL Gandhi Medical College.

***Corresponding Author Dr. Sudha Rani Chintagunta**

Associate Professor, Department of DVL, Govt Medical College, Nizamabad, Telangana State.

Article Received on 20/12/2016

Article Revised on 10/01/2017

Article Accepted on 30/01/2017

ABSTRACT

Background: Psoriasis is a chronic inflammatory disease and its pathogenesis involves an interaction between genetic, environmental and immunological factors. Recent studies have suggested that the chronic inflammatory nature of psoriasis may predispose to an association with other inflammatory diseases, especially cardiovascular diseases and metabolic disorders. **Aim:** To study the cardiovascular findings and associated risk factors in psoriatic patients. **Settings and Design:** cross sectional study. **Methods and Material:** 60 patients with psoriasis attending the department of DVL, Gandhi Hospital for a period of two years were included. Detailed history and clinical examination were carried out as per the proforma. Special attention was given to investigate the cardiovascular findings and associated risk factors. All the routine investigations and special investigations like ECG, 2D-echo, fasting lipid profile and C-reactive protein, BMI and waist circumference was calculated in all patients. **Statistical analysis:** chi square test (corrected) calculated using Epi info 7 software. **Results:** Male: female ratio was 2.3:1. The maximum incidence of psoriasis was in the age group of 31-40yr. Chronic plaque psoriasis was the commonest type (80%). Duration of the disease varied from 1 year to 10 yrs. Family history of psoriasis was present in 6.6% of cases. The various associated diseases detected were diabetes alone in 5%, hypertension alone in 16.7%, both in 20%, Cerebro vascular accidents in 1% and metabolic syndrome in 15% of the cases. Investigative findings include lipid abnormalities in 71.7%, elevated C-reactive protein in 13.3%, RA-factor in 1.7%, anaemia in 8.3%, ultrasound abnormalities in 16.7%, chest X Ray abnormalities in 8.3%, ECG abnormalities in 6.7% and 2D-Echo abnormalities in 11.7% of patients. The number of patients with overweight and obesity and addictions like alcohol intake and smoking was also significantly higher among psoriatic patients. **Conclusions:** Our observations showed that there was significantly increased presence of CVS changes in patients with joint involvement and in patients with abnormal LDL lipid levels. Many of psoriatic patients were overweight. Early detection of these risk factors and counselling will not only improve their quality of life but also decrease the risk of cardiovascular events.

KEYWORDS: cardiovascular findings, risk factors, psoriasis

INTRODUCTION

Psoriasis is a chronic inflammatory condition of the skin, in which genetic, environmental and immunological factors have a critical role. Recent studies have suggested that the chronic inflammatory nature of psoriasis may predispose to an association with other inflammatory diseases, especially cardiovascular and metabolic disorders. Psoriasis may be an independent risk factor for diabetes, atherosclerosis and subsequent myocardial infarction. Variations in lipid metabolism, smoking, alcoholism, hypocalcemia, malabsorption and malignancies may be associated with psoriasis. This

study was taken up in view of association between psoriasis and cardiovascular events and its risk factors.

Cardiovascular disease and related mortality in patients with psoriasis have been reported in both cohort and population-based studies.^[1,2,3] severe psoriasis that occurs at a relatively younger age is associated with an increased risk for cardiovascular mortality or myocardial infarction.^[1,4] One link between cardiovascular disease and psoriasis is the constellation of risk factors for cardiovascular disease, such as increased BMI, hypertension, dyslipidemia and type 2 diabetes, which

are also associated with psoriasis. Underlying chronic inflammatory processes are likely important shared characteristics of psoriasis and cardiovascular disease.

The association between psoriasis and cardiometabolic co-morbidities may derive from a genetic predisposition, but may also be the consequence of specific lifestyles including smoking, drinking, and sedentary habits.^[5] However, psoriasis may provide an additional and independent cardiovascular risk factor, most likely because several cytokines released by skin lesions can directly favour the development and progression of atherosclerosis.^[6] Disease severity also might influence risk, because patients with severe psoriasis have increased risk of metabolic disorders or cardiovascular diseases compared with patients with mild psoriasis and the general population.^[7,8]

The 10-year risks of coronary heart disease and stroke in patients with moderate to severe psoriasis was estimated using Framingham risk score algorithm.^[9] The model includes age, diabetes status, smoking status, blood pressure, total cholesterol and high-density lipoprotein (HDL) cholesterol as risk predictors.

MATERIAL AND METHODS 60 patients with psoriasis attending the DVL Dept, Gandhi Hospital for a period of two years were randomly selected for the study. All forms of psoriasis between ages of 20 to 60 yrs, both sexes were included. Patients with congenital, valvular heart disease, severe systemic hypertension, coronary artery disease, pericardial diseases and pregnancy were excluded from the study. Detailed history and clinical examination were carried out as per the proforma. Special attention was given to investigate the cardiovascular findings and associated risk factors. Routine investigations were done in all the patients which included complete blood picture, fasting and postprandial blood sugar, complete urine analysis, liver function tests, blood urea, serum creatinine, serum electrolytes, Ultrasound abdomen and chest X ray. Special investigations like ECG, 2D-echo, fasting lipid profile, C-reactive protein. X-ray of joints and RA factor were done in psoriatic arthritis patients. BMI was calculated in all patients. Waist circumference was calculated using measuring tape at the midway between the uppermost border of the iliac crest and the lower border of the costal margin.

RESULTS AND OBSERVATIONS: Out of 60 psoriatic patients, 42(70%) were males and 18(30%) were females. Male: female ratio was 2.3:1. The maximum incidence of psoriasis, was in the age group of 31-40yr. Duration of the disease was <1yr in 36.7%, 1-5yrs in 36.7% and 6-10yrs(13.3%). Family history of psoriasis was present in 6.6% of cases. The association of certain habits/addictions in psoriatics includes alcohol intake 38.3%, smoking 26.7%, pan chewing and tobacco chewing in 6.7% and 3.3% respectively. Chronic plaque psoriasis was the commonest type (80%). psoriatic

arthritis was noted in six (10%) and nail changes in 22 (36.6%) cases.

The body mass indices were shown in (Fig1). Normal weight in 53.3%, overweight in 33.3%, obesity in 11.3% and underweight was found in 1.7% of the cases. Lipid abnormalities were detected in 71.7% patients (Fig:2). Low HDL was the commonest abnormality followed by raised LDL, TG and total cholesterol. The various associated diseases and investigative findings include diabetes alone in 5%, hypertension alone in 16.7% and both in 20%, Cerebro vascular accidents in 1% and metabolic syndrome in 15% of the cases. Ultrasound abnormalities in 16.7%, Chest X Ray abnormalities in 8.3%, ECG abnormalities in 6.7%, 2D-Echo abnormalities in 11.7%, elevated C-reactive protein in 13.3%, RA-factor in 1.7% and anaemia in 8.3% were noted. (Fig:3)

The various ultrasound findings detected were grade 1 fatty liver in six cases, grade 2 hepatomegaly in two cases, cortical cysts and left renal calculi in one patient each.

The chest X ray findings were cardiomegaly in four and aortic knuckle calcification in one patient. ECG abnormalities noticed were ST elevation and qs complex in one, ST segment elevation in V5, V6 in one patient, q wave with T inversion in V4, V6 in one, T wave inversion in V5, V6 in one patient. 2D echo abnormalities detected were grade 1 diastolic dysfunction in four patients, dilated left atrium, trivial AR, mild PAH in one patient, EF 34%, RWMA+, akinetic LAD territory in one patient, EF 14% grade 3 diastolic dysfunction, mild MR, severe LV dysfunction in one patient.

The demographic and medical characteristics of studied psoriatic patients and their significance were shown in Table :1.

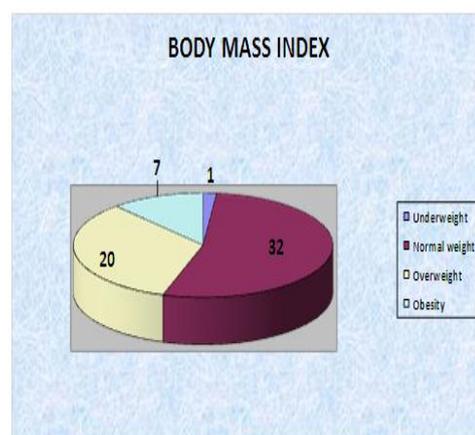


Fig.1

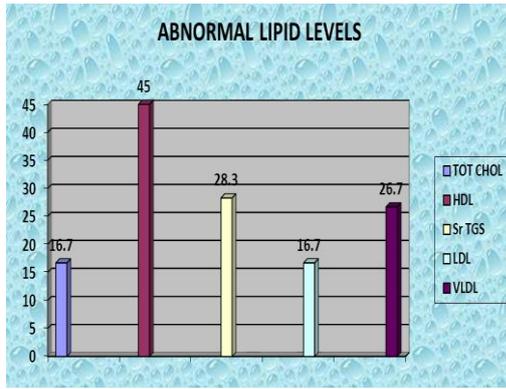


Fig 2

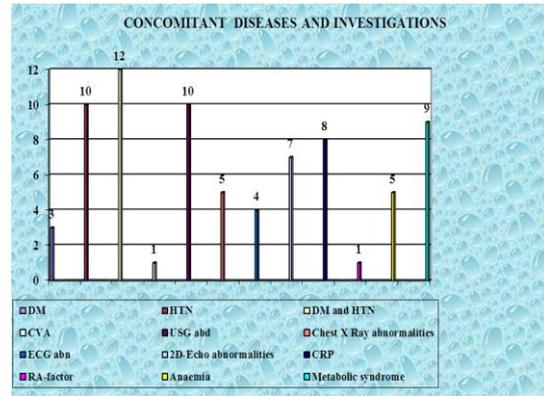
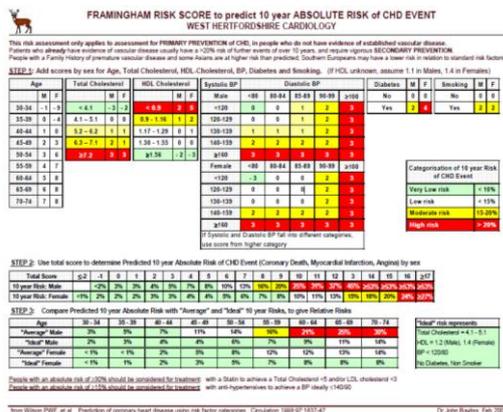


Fig.3

Table 1: Demographic and medical characteristics of studied psoriatic patients

	CVS changes	No CVS changes	P value
Male	10(23.8%)	32(76.2%)	42(100.0%)NS
Female	3(16.7%)	15(83.3%)	18(100.0%)NS
<40	6(21.43%)	22(78.57%)	28(100.0%)
>40	7(16.67%)	35(83.33%)	42(100.0%)
Joint+	5(83.3%)	1(16.7%)	6(100.0%)
Joint-	8(14.8%)	46(85.2%)	54(100%)
DM+	4(22.2%)	14(77.8%)	18(100.0%)
DM-	9(21.4%)	33(78.6%)	42(100.0%)
HTN+	5(23.8%)	16(76.2%)	21(100.0%)
HTN-	8(20.5%)	31(79.5%)	39(100.0%)NS
Cholesterol-abnormal	2(20.0%)	8(80.0%)	10(100.0%)
Cholesterol-normal	11(22.0%)	39(78.0%)	50(100.0%)
Alcohol intake -present	5(21.74%)	18(78.26%)	23(100.0%)
Alcohol intake -Absent	8(21.62%)	29(78.38%)	37(100.0%)
Smoking - present	5(31.25%)	11(68.75%)	16(100.0%)
Smoking -Absent	8(18.18%)	36(81.82%)	44(100.0%)
CRP - Increased	3(37.5%)	5(62.5%)	8(100.0%)
CRP - Normal	10(19.23%)	42(80.77%)	52(100.0%)



exacerbation during winter was noted by 28.3% of patients. Farber and Nall reported that 89% of their patients showed worsening in cold weather.^[13] Other exacerbating factors noticed were emotional stress in 5% of patients and sunlight in 3.3% of patients which is in concordance with the study done by Ros et al., eliciting 5.3%..^[14,15] Family history was present in 6.6%. Previous studies reported positive family history in 7.4 – 13.3% of cases.^[11] Higher figure of 36% was reported by Farber and Bright.^[16] and 4.1% by Ambady and Gopinath.^[17]

The most common clinical type was chronic plaque psoriasis in 80% followed by palmoplantar psoriasis in 10%, scalp and guttate psoriasis in 3.3%. Nail changes were observed in 36.3% of patients. The incidence of psoriatic arthritis in our study was 10%, in other studies ranged from 8-32%.^[18]

In this study ultrasound abnormalities observed in 16.67%, Zachariae and Sogaard(1973) reported that fatty metamorphosis, periportal inflammation and focal necrosis occurred more often in patients with psoriasis than in control population. It has been debated whether

DISCUSSION

In the present study of sixty patients, 70% were males and 30% were females (male:female-2.3:1) which is in agreement with the male preponderance noted in earlier studies.^[10,11,12] The duration of the disease varied from 15 days to 28 years. The chronicity of the disease is evident by the highest proportion of patients having the disease for more than one year. This is in agreement with a study which reported that 86.7% of patients had the disease for more than one year.^[10] A seasonal

increased alcohol intake in psoriatics might be the explanation. In a study by Gisondi *et al.*, Non-alcoholic fatty liver disease (NAFLD) was present in around half of patients with plaque psoriasis.^[19]

ECG abnormalities were present in 6.7 % (4) of cases and 2D echo abnormalities in 7 (11.7%) of the cases. In the study conducted by Serap Ozturkcan *et al* has shown ECG abnormalities in 3/36 patients (8.3%) and echocardiography showed normal EF values and systolic functions in all patients and stolic dysfunction in 15 (41.7%). In Study by Kothiwala, *et al.* 33.3% of patients with chronic plaque psoriasis had abnormal findings on ECG versus 6.7% of controls, the most common ECG abnormality noted was ST/T wave changes in 16.6% of patients. On ECHO 23.3% of patients had abnormal findings in contrast to 6.7% of controls.^[20] Most common change was low ejection fraction. One patient had both global ventricular hypertrophy and low ejection fraction. A study from Israel observed higher ECG abnormalities in patients with psoriatic arthritis when compared to controls.^[21] Nearly more than a fifth had abnormal echo findings in comparison to 6.7 % of controls. Biyik *et al* also reported similar findings in a study of 216 patients.^[22]

The chest X ray abnormalities included cardiomegaly in 4 pts, aortic knuckle calcification in one patients in our patients. Epidemiologic studies in Sweden, Germany, and the Unites States have demonstrated an association between psoriasis and cardiovascular disease (CVD).^[2,4]

Concomitant diabetes was seen in 18(30%) of cases. The study done by Bedi.^[23] and Sundharam.^[24] showed a relationship between abnormal glucose tolerance and psoriasis. Nutritional factors related hypercaloric dietary habits could play a significant role. Similarly associated hypertension may also be related to dietary habits. In this study concomitant hypertension was noticed in 21 (35%) of cases.

In the present study the lipid abnormalities were detected in 71.7% patients. In 2005 Mallbris *et al.*, in their study on psoriasis patients proved significant serum lipid abnormalities in the early course of the disease.^[16]

Mild depression was diagnosed in 2% of cases. Previous studies described a wide range of psychological problems associated with psoriasis such as depression, anxiety, obsessive behaviour, sexual dysfunction and suicidal ideation.^[25-28]

Cerebrovascular accidents noted in 1.7% cases and anemia in 8.3% cases in this study. Earlier studies (retrospective) also reported cerebrovascular accidents and anemia in psoriatic patients.^[29]

In this study increased incidence of overweight and obesity were seen in 33.3% and 11.33% of cases respectively. There has been an increase in publications

that suggest the existence of a relationship between psoriasis and a higher body mass index(BMI).^[30]

In this study we detected metabolic syndrome in 15% of the cases. Studies conducted by Gisondi *et al*^[5] and Cohen *et al.*^[31] demonstrated increased risk of metabolic syndrome in psoriatic patients. Alcohol intake in 38.3% of cases and Smoking in 26.7% of cases noted. In a study by Hayes J, Koo J anxiety, depression, smoking and alcohol abuse have been found to have a higher prevalence among psoriasis patients than healthy controls.^[32] C-reactive protein levels were elevated in 8.3% cases. Coimbra S *et al* proposed CRP as a useful marker of psoriasis severity that could be used to monitor psoriasis and its treatment.

In this study there was a high statistically significant difference in cvs changes between joint involved and joints uninvolved patients($p < 0.001$) and between patients with abnormal and normal LDL levels. There was no statistically significant difference in cvs changes between two genders, age groups, between normal and increased BMI patients, in diabetic and non diabetic patients, between hypertensive and non hypertensive patients, in patients with abnormal and normal total cholesterol levels, patients with abnormal and normal c-reactive protein levels.

CONCLUSIONS: Our observations showed that there was significantly increased presence of CVS changes in patients with joint involvement and in patients with abnormal LDL lipid levels. Many of psoriatic patients were overweight. More elaborate studies including more number of patients, studies of long duration (longer follow up period) and more parameters like detecting diabetes with GTT (Glucose Tolerance Test) and Hb1AC, exercise electrocardiography, highly sensitive C-reactive protein would surface out more subtle associations.

Appropriate therapies for psoriatic patients and counseling on lifestyle choices. will not only improve their quality of life but also decrease the risk of cardiovascular events by correcting their modifiable cardiovascular risk factors.

REFERENCES

1. Gelfand J.M., Neimann A.L., Shin D.B., *et al*: Risk of myocardial infarction in patients with psoriasis. *JAMA*, 2006; 296: 1735-1741.
2. Henseler T., Christophers E.: Disease concomitance in psoriasis. *J Am Acad Dermatol* 1995; 32: 982-986.
3. Ena P., Madeddu P., Glorioso N., *et al*: High prevalence of cardiovascular diseases and enhanced activity of the renin-angiotensin system in psoriatic patients. *Acta Cardiol* 1985; 40: 199-205.
4. Mallbris L., Akre O., Granath F., *et al*: Increased risk for cardiovascular mortality in psoriasis

- inpatients but not in outpatients. *Eur J Epidemiol* 2004; 19: 225-230.
5. Gisondi P., Girolomoni G.: Psoriasis and atherothrombotic diseases: disease-specific and non-disease-specific risk factors. *Semin Thromb Hemost* 2009; 35: 313-324.
 6. Nestle F.O., Kaplan D.H., Barker J.: Psoriasis. *N Engl J Med*, 2009; 361: 496-509.
 7. Wakkee M., Thio H.B., Prens E.P., et al: Unfavorable cardiovascular risk profiles in untreated and treated psoriasis patients. *Atherosclerosis* 2007; 190: 1-9.
 8. Kremers H.M., McEvoy M.T., Dann F.J., Gabriel S.E.: Heart disease in psoriasis. *J Am Acad Dermatol* 2007; 57: 347-354.
 9. Wilson P.W., D'Agostino R.B., Levy D., et al: Prediction of coronary heart disease using risk factor categories. *Circulation* 1998; 97: 1837-1847.
 10. Sharma T, Sepha GL. Psoriasis – Clinical Study. *Indian J Dermatol Venerol Leprol* 1964; 30: 191-197.
 11. Verma KC, Bhargave NC, Chaudhary et al. Psoriasis a clinical and some biochemical investigative study. *Indian J Dermatol Venerol Leprol* 1979; 45: 32-36.
 12. Mehta TK, Shah RN, Marquis L. A study of 300 cases of psoriasis. *Indian J Dermatol Venerol Leprol* 1976; 42: 67-74.
 13. Farber EM, Nall ML. The natural history of psoriasis in 5600 patients. *Dermatologica* 1974; 148: 1-18.
 14. Ros AM. Photosensitive psoriasis (editorial) *Photo dermatology* 1989; 6: 241-243.
 15. Ros Am, Eklund G. Photosensitive psoriasis an epidemiological study *J Am Acad Dermatol* 1987; 17: 752-758.
 16. Farber Em, Bright RD, Nall ML. Psoriasis – a questionnaire survey of 2144 patients *Arch Dermatol* 1968; 98: 248-259.
 17. Ambady BM, Gopinath T, Nair BKH. Psoriasis. *Ind J Dermatol Venerol Leprol*. 1961; 23: 27-34.
 18. Rosenberg EW, Noah PW, Zanolli MD et al. Use of Rifampicin with penicillin and erythromycin in the treatment of psoriasis. *J Am Acad Dermatol* 1986; 14: 761-764.
 19. Paolo Gisondi, Giovanni Targher, Giacomo Zoppini, Giampiero Girolomoni. Non-alcoholic Fatty Liver Disease in patients with chronic plaque psoriasis. *J Invest Dermatol* 2009; 51(4): 758-764.
 20. Sunil K. Kothiwala, Neena Khanna, Nikhil Tandon Nitish Naik, et al. Prevalence of metabolic syndrome and cardiovascular changes in patients with chronic plaque psoriasis and their correlation with disease severity : A hospital based cross – sectional study ; *Indian J Dermatol Venerol Leprol* 2016; 82: 510-518.
 21. Feld J, Weiss G, Rosner I, Rozenbaum M, Laor A, Rimar D, et al. Electrocardiographic findings in psoriatic arthritis; A case controlled study. *J Rheumatol* 2008; 35: 2379-82.
 22. Biyak I, Narin A, Bozok MA, Ergene O. Echocardiographic and clinical abnormalities inpatients with psoriasis. *J Int Med Res* 2006; 34: 632-9.
 23. Bedi Tilak R. Blood sugar and serum cholesterol levels in psoriasis *Indian J Dermatol Venerol Leprol* 1979; 45: 272-273.
 24. Sundharam JA, Singh Ratan, Agarwal. Psoriasis and Diabetes Mellitus. *Indian J Dermatol Venerol Leprol* 1980; 46: 158-162.
 25. Gupta MA, Gupta AK. Depression and suicidal ideation in dermatology patients with acne, alopecia areata, atopic dermatitis and psoriasis. *Br J Dermatol*. 1998; 139: 846-50.
 26. Rubino IA, Sonnino A, Pezzarossa B, et al. Personality disorders and psychiatric symptoms in psoriasis. *Psychol Rep*. 1995; 77: 547-53.
 27. Richards HL, Fortune DG, Weidmann A, et al. Detection of psychological distress in patients with psoriasis: low consensus between dermatologist and patient. *Br J Dermatol*. 2004; 151: 1227-33.
 28. Fortune DG, Richards HL, Kirby B, et al. Psychological distress impairs clearance of psoriasis in patients treated with photochemotherapy. *Arch Dermatol*. 2003; 139: 752-6.
 29. Charles J, McDonald, Paul Calabresi. Psoriasis and occlusive vascular disease. *Br J Dermatol* 1978; 99: 469.
 30. Naldi L, Chatenoud L, Linder D, et al. Cigarette smoking, body mass index, and stressful life events as risk factors for psoriasis: results from an Italian case-control study. *J Invest Dermatol*. 2005; 125: 61-7.
 31. Cohen A.D., Sherf M., Vidavsky L., et al: Association between psoriasis and the metabolic syndrome. A cross-sectional study *Dermatology* 2008; 216: 152-155.
 32. Hayes J, Koo J. *Dermatol Ther*, 2010; 23(2): 174-80.