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Frequency of Fragmented QRS in Psoriasis: A Prospective Case Control Study

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Abstract

Background: Array of clinical studies showed the interlink between psoriasis and cardiovascular diseases. Fragmentation of QRS has been visualized during myocardial fibrosis in electro cardiogram. *Objective*: To evaluate the prevalence of fragmented QRS in psoriasis patients and compare with the control. *Methods*: In this study 38 psoriasis patients and 38 healthy people were evaluated by physical examination, 12-lead ECG, Severity of the psoriasis was evaluated by psoriasis area and severity. Further anthropometric parameters like waist circumference were measured. Biochemical evaluation fasting blood glucose, lipid profile and kidney profile were estimated. index (PASI). *Results*: In this mean PASI score was 9.91±1.25. The psoriasis subjects displayed higher waist circumference as that of the control ($p<0.05$), Further, the HDL level was significantly decreased in psoriasis patients as that of the control subjects ($p<0.05$). Further, frequency of fragmented QRS was higher in psoriasis patients as that of the control and was found to be statistically significant ($p<0.05$). *Conclusion*: Thus, based on the observation in the present study, the frequency of fragmented QRS were elevated in psoriasis patients as compared to normal subjects.

Keywords: Psoriasis; PASI; Cardiovascular Disease; Fragmented QRS; Electro Cardiogram.

Introduction

Psoriasis is an immune-genetic mediated chronic inflammatory skin disease. Albeit, the pathophysiology of diseases is still obscure, previous studies indicates that susceptibility locus in the human leukocyte antigen region might be a possible factor [1,2]. Systemic low-grade inflammation may be noxious factor involved in the etiology of psoriasis [3,4]. Studies indicate that psoriasis subjects elicit higher prevalence of metabolic complications like dyslipidemia, hypertension, smoking, and obesity compared to those without psoriasis [5]. Further, mounting studies indicate that these metabolic complications may overture to develop a risk factor of coronary heart disease (CHD) [5-8] albeit, exact mechanism is still not clear.

Previous studies highlights that methotrexate and cyclosporine which are used in the management of psoriasis have been associated with hyperhomocysteinemia and lipid abnormalities respectively [9,10]. Further, higher incidence of atrioventricular conduction disturbances co-exists with HLA – B27 antigen, which is present in many psoriatic patients (Leszek). Further, a study conducted by Das et al. [11] has substantiated that fragmented QRS complex is potential marker for myocardial scar and confirmed it by myocardial spectron emission computed tomography in psoriasis patients. In this scenario, the present study was aimed to assess risk of myocardial fibrosis, in psoriatic patients by ECG analysis and correlates it with the severity of psoriasis.

Materials and Methods

The present study was a case control study carried at our Department of Dermatology and Cardiology,

Kilpauk Medical College, Chennai between July 2016 - August 2016. The present encompasses of 76 subjects and they are two groups as follows,

Group 1 – 38 psoriasis cases attending OP/IP in our hospital and designated as cases. The psoriasis subjects included in the study were Classic plaque type Psoriasis vulgaris.

Group 2 – 38 healthy volunteer and designated as control

Inclusion Criteria

Classic plaque type Psoriasis vulgaris patients and healthy volunteers were included in the study.

Exclusion Criteria

Atypical forms of psoriatic patients, patients with metabolic disease, systemic hypertension, diabetes mellitus, patient with history of psoriatic arthritis, other chronic systemic inflammatory disease, patients with known case of heart disease, cardiovascular drug use, chronic obstructive pulmonary disease, hypothyroidism, hyperthyroidism, smoking, malignancy, renal disease and liver disease were excluded from the study.

Clinical Investigations

Electrocardiography

A routine 12 lead ECG recording with the following conditions were used with a high pass filter: 005 – 20 Hz, low pass filter: 100 – 15 Hz, AC filter: 50 or 60 Hz, paper speed: 25 – 50 mm/sec and voltage: 1 mm/mV respectively.

Biochemical Investigations

The serum of the study subjects was collected and the following test like fasting blood glucose level, serum urea and creatinine were done. Further serum lipid markers like triglycerides and HDL levels were measured. The biochemical measurements were done using automated (alpha - Immuchem) and semi-automated (MERCK) auto analyzer. Blood pressure was also recorded using a standard protocol. Anthropometric measurement (waist circumference) was done using a plastic measuring tape.

Psoriasis Area Severity Index (PASI)

The body is divided into four sections head (H) (10%of a person`s skin); arms (A) (20%); trunk (T) (30%); legs (L) (40%). For each section, the percent of area of skin involved, is estimated and then transformed into a grade from 0 to 6. The grading was done as follows, Grade 1 < 10% of involved area, Grade 2 10-29% of involved area, Grade 3 30-49% of involved area, Grade 4 50-69% of involved area, Grade 5 70-89% of involved area and Grade 6 90-100% of involved area. Within each area, the severity is estimated by three clinical signs: erythema (redness), induration (thickness) and desquamation (scaling). Severity parameters are measured on a scale of 0 to 4, from none to maximum.

The sum of all three severity parameters is then calculated for each section of skin, multiplied by the area score for that area and multiplied by weight of respective section (0.1 for head, 0.2 for arms, 0.3 for body and 0.4 for legs).

Data Analysis

The severity of psoriasis in both the groups was expressed as percentage with 95% confident interval. The correlation between psoriasis severity and ECG findings was expressed as correlation coefficient (spearman). T-test was used for testing significance between proportions. $p < 0.05$ was considered as statistically significant for two tailed test. The SPSS V 20 was used for the analysis.

Results

All the data were shown in Table 1. The mean age of cases and control in the present was 47.61±15.4 and 40.32±11.05 years respectively and it was non-significant.

The systolic and diastolic blood pressure was found to non significant between the cases and controls (123.16±10.71 and 79.95±7.4 vs 113. 53±10.6 vs 75.21±8.5 mm/hg) respectively.

The waist circumference was significantly ($p<0.05$) higher in cases as compared to the control (94.08±10.77 vs 81.11±11.97 cms).

Further, there was no significant change in the level of fasting blood glucose between the cases and control (86.48±52.9 vs 93.55±54.0 mg/dl) respectively.

In the present study the serum creatinine level in cases and control was found to be 2.79±1.65 and 1.17±0.21 mg/dl respectively. However, the value was found to be statistically non significant between the groups.

In the current study, the serum triglycerides level in cases and control was found to be 145.74±

Table 1: Clinical Characteristics of the cases and control in the present study

Parameters		Patients (n= 38)	Control (n= 38)	p value
Age		47.61±15.4	40.32±11.05	NS
Sex	Male	17	21	NS
	Female	21	17	NS
Fragmented QRS complex frequency (No of Patients)		16	6	<0.05
PASI		9.91±1.25	0.00	< 0.05
Blood Pressure	Systolic	123.16±10.71	113.53±10.6	NS
	Diastolic	79.95±7.4	75.21±8.5	NS
Waist circumference (cms)		94.08±10.67	81.11±11.97	< 0.05
FBG (mg/dL)		86.48±52.9	93.55±54.00	NS
Creatinine (mg/dL)		2.79±1.65	1.17±0.21	NS
TG (mg/dL)		195.74±76.66	181.42±130.93	NS
HDL (mg/dL)		31.42±16.11	42.82±23.47	< 0.05

76.66 and 181.42±130.93mg/dl respectively. However, the value was found to be statistically non significant between the groups. Meanwhile, HDL level was significantly decreased in cases as that of the control (31.42±16.11 vs 42.82±23.47) and the value was found to be significant ($p<0.05$).

In the present study out of 30 patients, the QRS complex was seen in 16 subjects (42%) and absent in 22 subjects (58%). Meanwhile, in control the QRS complex was present only in 7 subjects (18.4%) and absent in 31 subjects (81.6%).

Albeit, no significant correlation between fragmented QRS complex and PASI was seen in our study, the incidence of fragmented QRS complex was significantly higher in psoriasis patients as that of the control.

Discussion

Mounting clinical evidences reports that array of co morbidities encompassing psoriasis like hyperlipidemia, hypertension and diabetes mellitus contribute to the development of cardiovascular diseases in psoriasis patients [12-14]. Further, natural risk and psoriasis induced psychological risk like obesity and and smoking may aggravate the cardiovascular risk [15,16]. Further, previous studies reported the connection between psoriasis and myocardial fibrosis [17,18]. Thus the present study focuses on the incidence of myocardial fibrosis among the psoriasis patients. Albeit, myocardial fibrosis is clinically vital, there is no simple method available for direct detection [19]. Due to this fact, presence of fQRS on ECG might be a valid importance. fQRS is a depolarization sign that is easily identified on ECG and thus shows the delay in impulse due to the presence of fibrotic tissue in myocardium. Further, in patients affected with cardiovascular disease ECG analysis of fQRS might be associated with myocardial scar. Furthermore, studies indicate that fQRS is more reliable and has elevated negative predictive value as that of the Q wave dispersion for scar tissue detection [20]. Additionally, fQRS has been shown to be related with myocardial fibrosis in studies based on CMR and SPECT examinations.

Previous studies reported the elevated fQRS frequency in pathologic conditions encompassing chronic systemic inflammation [21,22]. In our study, frequency of fQRS on ECG were higher in psoriasis patients compared to control group in a statistically significant ratio ($p<0.05$). However, the correlation of PASI score and fQRS was found to be statistically non significant.

Conclusion

In conclusion, we found that frequency of fQRS was significantly higher in psoriasis patients compared to control group that had similar demographic properties. In this backdrop, fQRS could be used as a reliable marker for myocardial fibrosis in psoriasis patients.

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Conflict of Interest:

None to declare

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