



P wave Dispersion: a valid cardiac marker for atrial fibrillation prediction in psoriasis patients.

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

An array of studies demonstrated the association between psoriasis and cardiovascular diseases. P wave dispersion (PWD) can be used to evaluate the risk of atrial arrhythmias. The aim of the present study was to evaluate the prevalence of PWD in psoriasis patients and compare with the control. 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 parameters like waist circumference were measured. Biochemical evaluation fasting blood glucose, lipid profile and kidney profile were estimated. 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, psoriasis patients displayed longer PWD as that of the control, but the value was found to be non significant (45.26 ± 18.41 vs 39.21 ± 15.13). Thus, based on the observation in the present study, PWD were increased in psoriasis patients compared to normal subjects.

Keywords: Psoriasis, PASI, cardiovascular disease, P wave dispersion, Electro cardiogram

Introduction

Psoriasis is chronic immune mediated inflammatory disease and its global prevalence is around 1–3% of human population [1]. Cardiovascular alteration like hypertension, atherosclerosis, and heart valve abnormalities are highly associated with psoriasis [2–5]. Albeit, the pathogenic mechanism is still obscure systemic inflammation with elevated CRP level, TH1 mediated cytokines and oxidative stress might be involved in the development of the disease [6, 7, 8, 9]. Rhythm and conduction alteration and sudden cardiac death are important manifestations of cardiac involvement in autoimmune rheumatic diseases with elevated inflammation. P wave dispersion (PWD) can be easily detected using a ECG and it is a valid marker of prolongation of intra-atrial and inter-atrial conduction time in addition to heterogeneous and discontinuous propagation of sinus impulses [10]. Prolongation of PWD is an independent risk factor for the progression of atrial fibrillation (AF). AF is the frequent cardiac abnormality

which increases the cardiovascular morbidity and mortality and decreases quality of life in general population [11]. Till date measurement of PWD are routinely used clinically to evaluate the risk of AF among the subjects with inflammatory diseases [12, 13]. In this regard, the present study was done to investigate the prevalence of PWD in psoriasis patients due to its chronic inflammatory condition.

Patients 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

Table 1: Clinical Characteristics of the Study Population at the Time of Examination

Parameters		Patients (n= 38)	Control (n= 38)	p
Age		47.61 ± 15.4	40.32 ± 11.05	NS
Sex	Male	17	21	NS
	Female	21	17	NS
P wave dispersion		45.26 ± 18.41	39.21 ± 15.13	NS
PASI		9.91 ± 1.25	0.00	< 0.05
BP	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

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.

In cases 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%).

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± 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 ($p < 0.05$).

The P wave dispersion among the cases and control was found to be 45.26 ± 18.41 and 39.21 ± 15.13 (ms) respectively. Further, in the present study there was no significant correlation between Psoriasis Area Severity Index (PASI) and P wave dispersion (Pearson correlation value 0.217).

Discussion

Mounting studies have reported that the cardiovascular disease and its associated risk factors like like hypertension, diabetes, hyperlipidemia, obesity, and smoking are highly prevalent in psoriasis patient as that of the normal population. with psoriasis than in the general population [14,15]. Further psychological conditions in psoriasis may drive the patients into obesity and smoking behavior which may impose the cardiovascular risk.

Systemic inflammatory response and oxidative stress are the cardinal factors involved in the development of psoriasis [2]. Furthermore, recent studies have also demonstrated an inflammatory background of ventricular arrhythmias and the possible implication of inflammation and oxidative stress in pathogenesis of atrial fibrillation [16].

P wave dispersion is the valid ECG marker employed to evaluate risk of atrial arrhythmias [17]. Several studies showed that PWD has a predictive value for AF in patients with various conditions [18, 19].

Inflammation associated with psoriasis may have an effect on increased PWD. In the present study, PWD was increased in psoriasis subjects but not significant as that of the control group. Further there was no significant correlation between PWD and PASI score.

In conclusion, PWD are increased in psoriasis patients and correlated with PASI. Thus, as per our study frequent cardiovascular examination is highly warranted in severe psoriasis patients long-lasting psoriasis patients.

Acknowledgement

This study was funded by the Indian Council of Medical Research, New Delhi (Reference Id: 2017-00541)

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