



Original Research Article

Assessment of QTc Dispersion in Psoriasis Patients: A Case Control Study

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Abstract

Background: Multiple studies demonstrated the association between psoriasis and cardiovascular diseases. QT dispersion (QTD) can be employed to evaluate the cardiac repolarization homogeneity and might be a risk for ventricular arrhythmias.

Objective: To evaluate the prevalence of QTD 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, psoriasis patients displayed longer QTcD as that of the control, but the value was found to be non significant (74.23 ± 33.48 vs 70.78 ± 29.98).

Conclusion: Thus, based on the observation in the present study, QTcD were increased in psoriasis patients compared to normal subjects.

Keywords: Psoriasis, PASI, cardiovascular disease, QTc dispersion, Electro cardiogram.

Introduction

Psoriasis is a chronic systemic inflammatory disease resembling the following pathological features like epidermal hyperproliferation, accelerated keratinocyte differentiation. Meanwhile T- cell mediated immune mechanism orchestrates a major role in psoriasis causing elevated cytokine levels which lead to the

formation of inflamed plaque affecting the skins, nails, scalp and joints ^[1]. Albeit, the pathology mechanism of psoriasis is still under limelight systemic inflammatory response and oxidative orchestrate a pivotal role in the development of disease Further some exo and endogenous factors like infection, drugs, stress, alcohol consumption, smoking, cold weather, lack of sunlight exposure

might be involved in the aggravation of the disease^[2]. Furthermore, extended period of inflammation and oxidative stress are touted to be responsible for cardiovascular disease. Meanwhile, psoriasis patients are highly prone to be affected with chronic diseases like hypertension, atherosclerosis, and heart valve abnormalities^[3]. Recent study highlights that psoriasis subjects are associated with the elevated risk of atrial fibrillation^[4]. Further, atrial fibrillation may overture to develop an array of cardiac abnormalities like ischemic stroke, cardiac arrest, coronary artery disease, and cardiovascular death. Evaluation of QT dispersion (QTd) can be used to identify the homogeneity of cardiac repolarization and autonomic function^[5]. Elevated heterogeneity of repolarization is in consistent with the aggravated risk of developing ventricular tachyarrhythmia^[6]. Furthermore, elevated proinflammatory cytokines are seen young individuals with ventricular arrhythmias having no evidence of myocardial injury, thus reflecting the role of inflammation of in ventricular arrhythmias. In this scenario, the present case control study was done to evaluate the prevalence of cardiac rhythmic abnormalities, particularly measuring the QT dispersion among the psoriasis subjects.

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 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 |
| QT dispersion (ms) | | 74.23 ± 33.48 | 70.78 ± 29.98 | NS |
| 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 |

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 ($p < 0.05$).

Meanwhile, QT dispersion among the cases and control was found to be 74.23±33.48 and 70.78±29.98 (ms) respectively and the value was found to be statistically non significant.

Further, in the present study there was no significant correlation between Psoriasis Area Severity Index (PASI) and QT dispersion (Pearson correlation value 0.285).

Discussion

Globally, psoriasis affects 3% of population encompassing 125 million individuals. Psoriasis is

a chronic inflammatory disease generally affecting the skin^[7]. The cardinal clinical manifestation of psoriasis is the systemic occurrence of Papulosquamous plaques on extensor surfaces of the joints. Psoriasis is not merely a skin disease but it is a systemic inflammatory condition which resembles other immune mediated inflammatory disease like rheumatoid arthritis and systemic lupus erythematosus^[8]. Multitude of cardiovascular diseases like atherosclerosis, hypertension, insulin resistance, and arrhythmias have similar pathological mechanism like chronic inflammation, increased nitric oxide level as a result of endothelial dysfunction and rampant generation of free radicals^[9]. Mounting studies highlights that psoriasis has been interrelated with elevated cardiovascular morbidity and mortality^[10,11]. Furthermore, recent data have displayed the involvement of inflammation in the progression of ventricular arrhythmias and the role of systemic inflammation and oxidative stress in etiology of atrial fibrillation^[12,13]. Further, chronic inflammation associated with psoriasis may have an effect on increased QTc dispersion^[14]. However in our study, there was an elevation in QTc dispersion in psoriasis subjects as that control, but the value was found to be non significant. Furthermore, no significant correlation was obtained between the PASI score and QTc dispersion in this study.

In conclusion, QTcD 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.

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