Increased Prevalence of the Metabolic Syndrome in Patients with Psoriatic Arthritis

Smriti K. Raychaudhuri,¹ Sidhartha Chatterjee,¹ Caroline Nguyen,² Manpreet Kaur,²
Ishwarlal Jialal, M.D., Ph.D.,^{1,2} and Siba P. Raychaudhuri, M.D.^{1,2}

Abstract

Objectives: Psoriasis (PsO) is a common chronic T cell-mediated inflammatory disorder traditionally thought to manifest in the skin and joints (psoriatic arthritis, PsA). Recently, it has been shown that these patients have an increased risk for myocardial infarction and this was greater with increasing severity of psoriasis. Patients with psoriasis have reported to have cardiometabolic disturbances including obesity, insulin resistance, and dyslipidemia. This constellation of risk factors, referred to as the metabolic syndrome, increases the risk for atherosclerotic cardiovascular disease (ASCVD) and type 2 diabetes mellitus. The aim of this study was to determine the prevalence of metabolic syndrome in PsA.

Methods: In our study, we examined the records of 105 patients with PsA to determine the prevalence of metabolic syndrome in PsA. This was a retrospective analysis of the Sacramento Veterans Affairs database.

Results: Our results demonstrated an increased prevalence of the metabolic syndrome in patients with PsA (61/105 patients or 58.1%) compared to the 35.2 % reported for the Third National Health and Nutrition Examination Survey (NHANES III) data.

Conclusions: Thus, patients with PsA have a very high prevalence of metabolic syndrome, which predisposes them to an increased risk of both diabetes and ASCVD.

Introduction

HEART DISEASE, RESPONSIBLE FOR 26% of all deaths in the United States in 2006, is the leading cause of mortality in the United States and in patients with rheumatological diseases.^{1–4} Studies have demonstrated that cardiovascular disease is accelerated in this patient population, but the cause remains unclear.³ Whereas cardiovascular risk factors such as age, gender, smoking, hypertension (HTN), and dyslipidemia have been shown to play a role in atherosclerosis, they do not appear to fully account for the increased risk of cardiovascular disease in rheumatologic patients.^{5,6} In the past few years, there has been mounting literature on the metabolic syndrome, a constellation of central adiposity, atherogenic dyslipidemia, HTN, and abnormal glucose tolerance.^{7–10} Metabolic syndrome increases the risk of developing atherosclerotic cardiovascular disease (ASCVD) at least two-fold and type 2 diabetes mellitus (T2DM) by five-fold.^{7–10} Interestingly, various studies have suggested that

metabolic syndrome is associated with a state of chronic, low-grade inflammation.^{11,12} The mechanism remains uncertain, but proinflammatory cytokines such as tumor necrosis factor- α (TNF- α) have been demonstrated to reduce the activity of insulin, contributing to insulin resistance.^{12–16} Furthermore, inflammation has not only been associated with obesity but also with insulin-resistance in the absence of an increase in total body fat.¹⁷

The literature on the relationship between rheumatological diseases and the metabolic syndrome is limited. However, a number of studies of gout, systemic lupus erythematosus, rheumatoid arthritis (RA), and ankylosing spondylitis reviewed elsewhere have demonstrated an increased frequency of metabolic syndrome in patients with rheumatologic disease.¹⁸ In addition, the association between the metabolic syndrome and psoriasis (PsO), a chronic inflammatory disorder of the skin involving immune-mediated disease involving T lymphocytes, has also been examined in

¹VA Medical Center, Mather, California.

²University of California Davis, School of Medicine, Davis, California.

cross-sectional and epidemiological studies.^{19–27} Symptoms of PsO are generally limited to the skin with the exception of an inflammatory arthropathy, known as psoriatic arthritis (PsA). Recent epidemiological surveys suggest PsA is more common than previously estimated.^{28,29} A study of nearly 5,000 patients found nearly 30% of patients with PsO had concomitant arthritis.³⁰ Recently, Gelfand et al. showed that PsO confers an independent greater risk for myocardial infarction which increased with severity of psoriasis.³¹ However, there is scanty data on the prevalence of metabolic syndrome in patients with PsA. Here we investigated the prevalence of metabolic syndrome in patients with PsA specifically.

Materials and Methods

We conducted a retrospective case study using data from 105 patients with diagnosed PsA obtained from patient charts at a Veterans Affairs (VA) Medical Center. These patients were recruited from the patient database of the VA Medical Center Mather, California. Relevant information including age, weight, body mass index (BMI), waist circumference, latest blood pressure, fasting lipid profile, and glucose levels. In addition, the patient charts were screened for the presence of coronary artery disease, chronic renal failure/kidney disease, HTN, hyperlipidemia, and T2DM along with the date of onset for the disease. The metabolic syndrome was defined according to the American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI) criteria.⁷ These criteria define the presence of the metabolic syndrome if three of the five following features are present: (1) Waist circumference ≥ 40 inches in men and ≥ 35 inches in women; (2) fasting triglycerides, ≥ 150 mg/dL or drug treatment for elevated triglycerides; (3) reduced high-density lipoprotein cholesterol (HDL-C), <40 mg/dL in men and <50 mg/dL in women, or drug treatment for reduced HDL-C; (4) blood pressure, ≥ 130 mmHg systolic blood pressure (SBP) or ≥ 85 mmHg diastolic blood pressure (DBP) or antihypertensive drug therapy; (5) fasting glucose, ≥ 100 mg/dL or drug treatment for hyperglycemia.

Results

The study included 105 patients with psoriatic arthritis (100 males and 5 females). The mean age was 59.8 years with a range from 29 to 85 years. The prevalence of metabolic syndrome diagnosed according to AHA/NHLBI guidelines was 58.1%, with 61 out of 105 patients fulfilling at least three of the five features needed for diagnosing the syndrome. Whereas this was predominantly a study of males, 58% of the males and 60% of the females had metabolic syndrome. Of the patients with metabolic syndrome, 15 (24.6%) had coronary artery disease, 24 (39.3%) had T2DM, and 11 (18.0%) had chronic kidney disease. Of our 61 patients with metabolic syndrome, 45 patients had three features, 13 patients had four, and 6 patients had five features. Details of the distribution of these five conditions in patients with metabolic syndrome are depicted in Fig. 1. The three commonest features included increased triglycerides (54.3%), decreased HDL-C (51.4%), and hypertension (56.2%).

Discussion

Our results indicate that the prevalence of the metabolic syndrome is high in patients with PsA. We report a prevalence of 58.1%, which is much higher than the 35.2% of the NHANES III population.³² Patients with PsA appear to be at an increased risk of developing diabetes mellitus, arterial hypertension, dyslipidemia, obesity, and cardiac disease. Although the precise pathogenesis remains to be elucidated, chronic inflammatory changes, such as the secretion of proinflammatory cytokines, may be responsible.^{5,33} Data in patients with RA have confirmed a correlation between lasting arthritis and the development of metabolic syndrome with eventual coronary heart disease (CHD).³⁴ Among the cytokines involved, TNF- α and interleukin-6 (IL-6) have been shown to play important roles.³⁵ TNF- α has been shown to impair insulin-mediated glucose uptake in adipose tissue and glucose metabolism.^{36–38} Some studies suggest therapeutic intervention with antiinflammatory drugs such as methotrexate (MTX) and TNF- α antagonists may reduce risk.^{39,40} Studies of TNF- α antagonists in RA appear

FIG. 1. The frequency of features of the metabolic syndrome in psoriatic arthritis. Abbreviation: HDL-C, high-density lipoprotein cholesterol.

to demonstrate an improvement in insulin resistance and sensitivity, but suggest minimum benefit and possibly negative effects on lipid profiles.^{41,42} However, given the transient nature of lipid profiles and possible confounding factors such as concomitant therapy, conclusions are limited. Very little data exist regarding metabolic syndrome and TNF- α antagonists in PsA. Limited preliminary data from psoriatic patients appear to support an improvement in insulin resistance and sensitivity with TNF- α antagonist therapy.⁴³ Factors such as smoking, age, gender, and alcohol may also play a role. However, studies have found that even when these factors are accounted for there is a higher prevalence of concomitant findings associated with metabolic syndrome in individuals with rheumatological disorders.¹⁹

Our findings of a high prevalence of metabolic syndrome (58%) emphasize the need for close monitoring of patients with PsA for concomitant diseases such as diabetes mellitus, hypertension, and dyslipidemia. Furthermore, patients are at increased risk for diabetes and ASCVD. Lifestyle interventions and drug therapies for abnormalities in the individual risk factors may be necessary. As with RA patients, effective treatment of PsA in an effort to minimize chronic inflammation may also be important. Additional prospective controlled studies with patients with PsA and the metabolic syndrome need to be undertaken to better understand the pathophysiology especially as it relates to circulating and cellular biomarkers of inflammation and the risk of both diabetes and ASCVD.

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Author Disclosure Statement

No competing financial interests exist for any of the authors.

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Address correspondence to:
Siba P. Raychaudhuri, M.D.
UC Davis School of Medicine
and VA Sacramento Medical Center
Division of Rheumatology, Allergy and Clinical Immunology
1911 Geneva Place
Davis, CA 95618

E-mail: raysiba@aol.com