Psoriasis and Cardiovascular Disease

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KEYWORDS

• Psoriasis • Psoriatic arthritis • Metabolic syndrome • Cardiovascular disease
• Cerebrovascular disease

KEY POINTS

- Psoriasis patients have an increased risk of adverse cardiovascular events and related mortality.
- Psoriasis is associated with environmental risk factors, the metabolic syndrome, chronic kidney disease, venous thromboembolism, peripheral arterial disease, ischemic heart disease, heart failure, atrial fibrillation, and ischemic stroke.
- Psoriatic disease and atherosclerosis share similar pathogenic mechanisms and inflammatory pathways.
- Measures of subclinical atherosclerosis and related biomarkers may be useful to predict which patients are at the greatest risk for future cardiovascular events.
- Treatment goals should focus on targeting inflammation as well as careful screening and treatment of modifiable risk factors.

INTRODUCTION

Psoriasis is a chronic, waxing and waning, inflammatory skin disorder with hyperproliferation of keratinocytes resulting in indurated, erythematous, scaly, and often pruritic plaques.[1] The disease also has the potential to affect the joints, causing a destructive inflammatory arthropathy similar to rheumatoid arthritis and ankylosing spondylitis.[2] Like other chronic inflammatory disorders, psoriasis has been shown to result in systemic inflammation with an increase in acute phase reactants and inflammatory biomarkers. There is a strong genetic component, but environmental

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factors can also trigger or worsen the disease.[1] Psoriasis has been shown to decrease quality of life significantly in its sufferers.[3] Treatment options include phototherapy, topical preparations including steroids, the vitamin D analog calcipotriene, calcineurin inhibitors, tar products, retinoids, nonbiologic disease-modifying drugs such as methotrexate and cyclosporine, and targeted biologic therapies including tumor necrosis factor (TNF)-α inhibitors, interleukin (IL)-12/23 inhibitors, and IL-17 inhibitors.[1]

Psoriasis is closely linked with the metabolic syndrome[4] and has been associated with an increased risk of various cardiovascular diseases, including renal insufficiency,[5] deep venous thromboses, pulmonary emboli,[6] peripheral arterial disease, coronary artery disease (CAD),[7] cardiomyopathy,[8] atrial fibrillation, and ischemic stroke.[9] Patients with psoriasis have significantly increased cardiovascular morbidity and mortality,[10] which results in a profound economic burden.[11] This review aims to explore the prevalence and characteristics of cardiovascular comorbidities in patients with psoriatic disease, the shared pathogenic mechanisms between psoriasis and atherosclerosis, useful clinical measures to predict future risk, the relationship of psoriasis treatments to cardiovascular outcomes, and the importance of screening for and treating modifiable risk factors.

PREVALENCE OF CARDIOVASCULAR COMORBIDITIES

Environmental Risk Factors

Although psoriasis is recognized as an independent risk factor for cardiovascular disease, patients with psoriasis have also been shown to have higher rates of classic environmental risk factors, such as smoking, alcohol use, and a sedentary lifestyle. Multiple observational studies have shown an association between smoking and psoriasis,[12–15] and a recent meta-analysis revealed that patients with psoriasis are 1.78 times more likely than the general population to be current smokers.[16] Similarly, in a systematic review examining the relationship between psoriasis and alcohol consumption, approximately 78% of the selected studies demonstrated an increased prevalence of alcohol abuse in patients with psoriasis.[17] Patients with severe psoriasis have also been shown to exercise less, with an odds ratio (OR) of 3.42 for a low level of physical activity based on the International Physical Activity Questionnaire–Short Form.[18]

The Metabolic Syndrome

The metabolic syndrome, which includes central obesity, dyslipidemia, hypertension, and insulin resistance, constitutes a proinflammatory, hypercoagulable state[19] and has long been associated with psoriatic disease.[4,20–22]

Obesity

In a meta-analysis performed by Armstrong and colleagues,[23] patients with mild psoriasis were 1.46 times more likely to be obese, and patients with severe psoriasis were 2.23 times more likely to be obese than controls. More important, psoriasis has been associated with increases in waist circumference[24,25] and waist-to-height ratio,[26] indicators of central obesity and abdominal visceral fat, which confer an even greater risk of cardiovascular disease.[27] Patients are also disproportionately affected by other miscellaneous obesity-related comorbidities, including obstructive sleep apnea,[28] nonalcoholic fatty liver disease,[29,30] and polycystic ovarian syndrome.[31]

Dyslipidemia

Interestingly, despite the clearly established relationship between psoriasis, the metabolic syndrome, and cardiovascular disease, studies evaluating the prevalence of