Association of Coronary Artery Disease with Psoriasis in a Group of Jordanian Patients

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ABSTRACT

Objective: To study the association between psoriasis and coronary artery disease, and to compare the rate of coronary artery disease in a group of Jordanian patients with moderate to severe psoriasis to that in a group of non-psoriatic patients.

Methods: This retrospective review was conducted at King Hussein Medical Center (Amman-Jordan) and Prince Ali Bin Alhussein Hospital (Karak-Jordan). Data were collected from March 2008 to October 2012. Psoriasis group included 157 Jordanian patients with moderate to severe psoriasis, while control group included 183 non-psoriatic, Jordanian patients. Patients in both groups were matched by age, sex, and risk factors of coronary artery disease (smoking, hypertension, diabetes, hyperlipidemia, and family history of coronary artery disease). Rate of coronary artery disease in psoriasis group was compared to that in non-psoriasis group.

Results: The rates and P-value of coronary artery disease risk factors in psoriasis group compared to controls were as follows: mean age (42.2 y, 37.6 y, 0.03), male gender (64.9%, 61.2%, 0.05), smoking (62.4%, 58.5%, 0.43), hypertension (39.5%, 41.5%, 0.27), diabetes (38.2%, 37.7%, 0.31), hyperlipidemia (18.4%, 17.5%, 0.44) and family history of coronary artery disease (33.1%, 31.1%, 0.04). After matching for these risk factors, the rate of coronary artery disease in psoriasis group, and in controls was 7.0%, and 1.6%, respectively, with P-value<0.001.

Conclusion: Even after matching for other risk factors, the rate of coronary artery disease is still higher in patients with moderate to severe psoriasis than in patients without psoriasis. So, moderate to severe psoriasis is independently associated with coronary artery disease.

Key words: Jordanian, Association, Coronary artery disease, Psoriasis.

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Introduction

Psoriasis is a chronic inflammatory disease that affects 1-3% of the population worldwide.[1]

It is characterized by Th1/Th17-driven inflammation which stimulates tumor necrosis factor (TNF-**α**) and other mediators. This impairs proliferation and differentiation of keratinocytes, and cause abnormal skin vascularization.[1,2]

The most common clinical variant is psoriasis vulgaris, characterized by well demarcated erythematous plaques covered by silvery scales mainly on the scalp, face, elbows, knees, palms, and soles. Other variants include nail psoriasis, inverse psoriasis, pustular psoriasis, guttate psoriasis, and sero-negative psoriatic arthritis.[1,2]

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Regarding severity, psoriasis is classified into mild, moderate, and severe psoriasis. Psoriasis is considered moderate to severe if psoriasis area severity index (PASI) score was 10 or more, patients were hospitalized or received systemic medication for psoriasis.[3]

Psoriasis is well-known to be associated with many co-morbidities including arthritis, Crohn's disease, cutaneous T-cell lymphoma, metabolic syndrome (atherogenic dyslipidemia, hypertension, abdominal obesity, diabetes and insulin resistance), predisposition to thrombosis, nonalcoholic hepatic steatosis, anxiety, depression, smoking, and alcoholism.[4,5]

Recently, psoriasis has also been thought of as a systemic inflammatory condition, with similarities to rheumatoid arthritis and systemic lupus erythematosus.

Since the risk of coronary artery disease (CAD) is increased in these diseases, it was logic to assume similar association between CAD and psoriasis.

Not only are CAD risk factors more prevalent in psoriasis, but even after these risk factors are controlled for, CAD is still more prevalent in psoriasis.[6,7,8]

Methods

After having the approval from the ethical committee of the Jordanian Royal Medical Services, data for this retrospective analysis were collected at Medical Records Sections of King Hussein Medical Center (Amman, Jordan) and Prince Ali Bin Al Hussein Hospital (Karak-Jordan) between March 2008 and October 2012. Records of adult patients, defined as 17 years of age or older, were analyzed.

Psoriasis group included 157 Jordanian patients with moderate to severe psoriasis, including psoriatic arthritis. Psoriasis was considered moderate to severe if PASI score was 10 or more; patients were hospitalized or received systemic medication for psoriasis. Control group included 183 Jordanian patients without psoriasis who were selected from the same centers.

After making adjustments for age, sex and risk factors of CAD (smoking, hypertension, diabetes, hyperlipidemia, and family history of CAD), rates of CAD in both groups were estimated and compared.

Results

A total of 157 Jordanian patients were included in the moderate to severe psoriasis group. Age ranges between 17 years and 56 years (mean age 42.2 years), and males accounted for 64.9% of the sample (male: female ratio=102:55=1.8:1). Controls (non-psoriasis group) were 183 Jordanian patients, 61.2% of whom were males (male: female ratio=112:71=1.6:1), with age range of 19-51 years (mean age 37.6 years). Rates of risk factors of CAD in moderate to severe psoriasis group were as follows: smoking 62.4% (98/157), hypertension 39.5% (62/157), diabetes 38.2% (60/157), hyperlipidemia 18.4% (29/157), and family history of CAD 33.1% (52/157). In the non-psoriasis group, the rates of these risk factors were as follows: smoking 58.5% (107/183), hypertension 41.5% (76/183), diabetes 37.7% (69/183), hyperlipidemia 17.5% (32/183), and family history of CAD 31.1% (57/183). The respective P-values comparing the rate of CAD risk factors between these two groups were: 0.03 for the mean age, 0.05 for the male gender, 0.43 for smoking, 0.27 for hypertension, 0.31 for diabetes, 0.44 for hyperlipidemia, and 0.04 for family history of CAD.

Eleven out of the 156 psoriatic patients were found to have CAD, with estimated rate of 7.0%. On the other hand, the rate of CAD in non-psoriasis group was found to be 1.6% (3/183). The difference was statistically significant with P-value<0.001.

These results are summarized in Table I.

Discussion

Psoriasis is a chronic inflammatory skin disorder with multisystem involvement.

In addition to the economic burden, psoriasis impairs the physical and psychological well-being of the patient, reducing his quality of life and work productivity.[1,2] Psoriasis is well known to be associated with many co-morbidities, one of which could be CAD.[1,4,5]

In our study, as shown in (Table I), 7.0% of the patients in psoriasis group (11/156) were found to have CAD. On the other hand, CAD rate in non-psoriasis group was 1.6% (3/183). This difference is statistically significant (P-value<0.001).

Table I: Age, sex, rate and P-value of coronary artery disease (CAD) and its risk factors in psoriatic and non-psoriatic patients.

	Psoriasis group	Non-psoriasis group	P-value
Mean age, years	42.2	37.6	0.03
Male, no. (%)	102 (64.9)	112 (61.2)	0.05
Smoker, no. (%)	98 (62.4)	107 (58.5)	0.43
Hypertension, no. (%)	62 (39.5)	76 (41.5)	0.27
Diabetes, no. (%)	60 (38.2)	69 (37.7)	0.31
Hyperlipidemia, no. (%)	29 (18.4)	32 (17.5)	0.44
Family history, no. (%)	52 (33.1)	57 (31.1)	0.04
Rate of CAD (%)	7.0	1.6	<0.001

This finding is consistent with the study of Kimball *et al*,[5] among other studies,[6,7,8] that demonstrate that, like in other Th1-mediated inflammatory diseases, e.g. systemic lupus erythematosus and rheumatoid arthritis, CAD is more common in psoriatic patients, especially severe cases, than in the general population.

The cause of this association is unclear. Gisondi *et al*[6] and other authors [7,8,9] suggest that to be due to increased prevalence of CAD risk factors (obesity, smoking, hypertension, diabetes, hyperlipidemia, and family history of CAD) among psoriatic patients.

In our study, the patients in both groups were controlled for these risk factors. Regarding CAD risk factors, rates and P-values showed no statistically significant difference between psoriasis group and non-psoriasis group (see Table I).

Our results are compatible with the work of Ahlehoff *et al*,[10] and other studies,[11,12,13] that showed psoriasis to be independently associated with CAD. These studies showed psoriasis and atherosclerosis to have the same etiology, which is increased Th1–mediated inflammation and dysangiogenesis.

This concept is further supported by the studies that demonstrated that systemic therapies for psoriasis decrease the risk of cardiovascular events,[14,15,16] and other studies which showed psoriatic patients to have increased carotid intima–media thickness and endothelial dysfunction, and increased levels of pro-thrombotic markers, which play a key role in atherosclerosis.[17,18]

Conclusion

Our study may add to the strength of evidence that CAD is associated with psoriasis, but this conclusion cannot be generalized for all psoriatic patients, because our study was based on data from patients with a moderate to severe psoriasis, but not mild psoriasis. Other studies are needed to determine the risk of CAD in patients with milder skin disease.

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