THE JOURNAL OF
SEXUAL MEDICINE

Erectile Dysfunction in Male Adults With Atopic Dermatitis and Psoriasis

Alexander Egeberg, MD, PhD,[1] Peter R. Hansen, MD, PhD, DMSc,[2] Gunnar H. Gislason, MD, PhD,[2,3,4] Lone Skov, MD, PhD, DMSc,[1] and Jacob P. Thyssen, MD, PhD, DMSc[1]

ABSTRACT

Introduction: Patients with psoriasis have increased risk of cardiovascular disease, but data on atopic dermatitis (AD) are less clear-cut. However, it is well-established that erectile dysfunction (ED) can serve as a risk marker for coronary disease.

Aim: To investigate the incidence, prevalence, and risk of ED in men with psoriasis and AD.

Methods: The sample included all Danish men at least 30 years old. In patients with AD and psoriasis, we determined disease severity based on use of systemic therapy. We performed a cross-sectional study (January 1, 2008) using logistic regression to estimate the prevalence and odds ratio of ED. Moreover, in a cohort study design, patients were followed from January 1, 2008 through December 31, 2012, and Cox regression models were used to estimate adjusted hazard ratios of new-onset ED. Models were adjusted for potential confounding factors, including age, socioeconomic status, health care consumption, smoking, alcohol abuse, diabetes, and cholesterol-lowering drug use.

Main Outcome Measures: The outcome was initiation of pharmacotherapy used for treatment of ED.

Results: The sample consisted of 1,756,679 Danish men (age range = 30−100 years), of which 2,373 and 26,536 had adult AD (mild = 1,072; severe = 1,301) and psoriasis (mild = 21,775; severe = 4,761), respectively. Mean ages (SDs) were 53.0 (14.6), 46.7 (12.0), and 56.3 (13.8) years for the general population, patients with AD, and patients with psoriasis, respectively. Prevalences of ED were 8.7%, 6.7%, and 12.8% for the general population, patients with AD, and patients with psoriasis, respectively. Adjusted odds ratios (logistic regression) of ED were decreased in patients with AD (0.68; 0.57−0.80) but increased in those with psoriasis (1.15; 1.11−1.20). Adjusted odds ratios for mild and severe AD were 0.63 (0.48−0.82) and 0.72 (0.58−0.88), respectively, and those for psoriasis these were 1.16 (1.11−1.21) and 1.13 (1.03−1.23). Adjusted hazard ratios (Cox regression) were 0.92 (0.76−1.11) for AD and 1.14 (1.08−1.20) for psoriasis. The ED risk was not increased in men with mild AD (0.85; 0.63−1.14) or severe AD (0.97; 0.76−1.24) but was significantly increased in men with mild psoriasis (1.13; 1.09−1.20) and severe psoriasis (1.17; 1.04−1.32).

Conclusion: We found an increased prevalence and risk of ED in men with psoriasis, whereas the risk was comparable to (and even slightly lower than) the general population for men with AD. **Egeberg A, Hansen PR, Gislason GH, et al. Erectile Dysfunction in Male Adults With Atopic Dermatitis and Psoriasis. J Sex Med 2017;XX:X−XX.**

Key Words: Erectile Dysfunction; Psoriasis; Atopic Dermatitis; Cardiovascular Disease

INTRODUCTION

Psoriasis and atopic dermatitis (AD) are prevalent chronic inflammatory skin diseases that commonly affect children and adults. In recent years, there has been growing interest in the potential systemic implications and comorbidities associated with these conditions. Compelling evidence has shown that patients with psoriasis have an increased risk of a range of comorbidities, including cardiovascular (CV) disease and CV mortality.[1−4] Hypertension, dyslipidemia, and type 2 diabetes (T2D) frequently occur in patients with psoriasis, and there is a high prevalence of smoking and alcohol consumption in these

Received October 3, 2016. Accepted December 24, 2016.

[1]Department of Dermatology and Allergy, Herlev and Gentofte Hospital, University of Copenhagen, Hellerup, Denmark;

[2]Department of Cardiology, Herlev and Gentofte Hospital, University of Copenhagen, Hellerup, Denmark;

[3]The Danish Heart Foundation, Copenhagen, Denmark;

[4]The National Institute of Public Health, University of Southern Denmark, Copenhagen, Denmark

http://dx.doi.org/10.1016/j.jsxm.2016.12.233

patients.[5,6] Also, patients with psoriasis have significantly increased risk of depression, and the presence of psoriasis is strongly associated with decreased quality of life.[7,8]

Although AD has been associated with increased risk of CV disease in some but not all studies from Asia and North America,[9–12] a study from Denmark was unable to confirm these findings.[13]

Erectile dysfunction (ED), a prevalent disorder affecting more than 150 million men worldwide,[14,15] is defined as the recurrent or persistent inability to achieve and/or maintain an erection for satisfactory intercourse to occur. Although ED was once assumed to be a purely psychological condition,[16] it has been shown to share risk factors with CV disease, including age, diabetes, smoking, hypertension, and hypercholesterolemia, suggesting an underlying vascular pathology.[17–21] Indeed, ED has been put forward as a diagnostic marker for CV disease.[22] However, it is important to note that ED is a multifactorial condition in which organic, relational, and intrapsychic factors can play important roles.[23–26] Although studies have examined the association between ED and psoriasis, little is known about the risk in men with AD.[27,28] Therefore, we examined the prevalence and risk of new-onset ED in men with AD and psoriasis, respectively, compared with the general population in Denmark.

METHODS

Data Sources and Study Population

The present study was approved by the Danish Data Protection Agency (reference number 2007-58-0015, internal reference number GEH-2014-018, I-Suite 02736). In Denmark, registry studies do not require approval from an ethics committee. The study was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology recommendations.[29]

Nationwide administrative registries allow for individual-level linkage of data on all Danish citizens.[30] The Danish National Patient Register[31] (DNPR) contains detailed information on all in- and outpatient (ambulatory) hospital consultations according to the *International Classification of Diseases, Eighth Revision* (ICD-8) and *Tenth Revision* (ICD-10). The ninth revision was never used in Denmark. Since 1994, the Danish Registry of Medicinal Products Statistics[32] has recorded information on all pharmacy-dispensed medications in Denmark according to the international Anatomical Therapeutic Chemical (ATC) classification, and data on tax-reported household income are recorded by Statistics Denmark.[33]

The present sample consisted of all Danish men at least 30 years old who were alive and residing in Denmark on January 1, 2008 (ie, date of study start for all individuals in the cohort study). Subjects were followed from study start until December 31, 2012, death, migration, or the occurrence of an end point, whichever came first. Patients were classified as having adult AD if they had, at or after their 18th birthday but before study start, received a (in- or outpatient) diagnosis of AD by a dermatologist (ICD-8 code 691 and ICD-10 code L20) recorded in the DNPR. Patients with psoriasis were identified by a diagnosis of psoriasis (ICD-8 code 696.1 and ICD-10 code L40) recorded in the DNPR or if they had dispensed at least two prescriptions of topical vitamin D derivatives (ATC code D05AX), which is the preferred first-line treatment and used exclusively for psoriasis in Denmark. At least two prescriptions were required to ensure persistent medical therapy. AD occurs predominantly in early childhood, and most patients outgrow their disease. However, in patients with AD in adulthood, the disease is considered chronic. Therefore, to ensure that patients truly had adult AD, a diagnosis in adulthood (ie, 18–30 years old) was required for study inclusion, and therefore the present study included only patients at least 30 years old at baseline. Patients were classified with severe disease if they received systemic therapy for AD (methotrexate, azathioprine, mycophenolate mofetil, systemic corticosteroids, psoralen plus ultraviolet A, or cyclosporine) or psoriasis (methotrexate, psoralen plus ultraviolet A, retinoids, cyclosporine, adalimumab, efalizumab, etanercept, infliximab, or ustekinumab) consistent with severe disease. Patients who did not receive such therapy were classified as having mild AD. We previously described and validated the method for identification of psoriasis and classification of severity.[34] Collection of data on diabetes, hypertension, smoking history, and alcohol abuse has been described in detail elsewhere.[34–36] From Statistics Denmark we used information on tax-reported household income to calculate an age-standardized index of socioeconomic status based on the mean gross annual income during a 5-year period before study start. We defined ED by patients' first claimed prescription for drugs used in treatment of male ED (ie, sildenafil, ATC code G04BE03; tadalafil, ATC code G04BE08; vardenafil, ATC code G04BE09; or avanafil, ATC code G04BE10). These are the only drugs approved for this indication in Denmark. Use of such pharmacotherapy for identification of ED enabled the evaluation of a possible association with the organic, relational, and psychological aspects related to AD and psoriasis because these drugs can be used regardless of the underlying disease mechanism.

Statistical Analysis

We described baseline characteristics with means and SDs for continuous variables and frequencies and percentages for categorical variables. The baseline prevalence of ED was determined as the percentage of individuals who had claimed a prescription for drugs used in treatment of ED from January 1, 1994 (when the Danish Registry of Medicinal Products Statistics was established) through January 1, 2008. A cross-sectional design was applied using logistic regression models to assess the odds ratios (ORs) of ED on January 1, 2008. In a cohort study design, patients were followed from January 1, 2008 to death, migration, December 31, 2012, or the occurrence of ED, whichever came first. Incidence rates per 1,000 person-years were estimated, and Cox regression models were used to obtain hazard ratios (HRs) for the risk of incident ED. Incidence of ED during follow-up