Increased risk of avascular necrosis in patients with psoriatic disease: A nationwide population-based matched cohort study

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Background: Avascular necrosis (AVN) and psoriasis have some pathogenic mechanisms and associated conditions in common.

Objective: To examine the association between psoriasis and AVN.

Methods: This study used data from the Taiwan National Health Insurance Research Database for the period 2004−2006 and identified 28,268 patients with psoriasis, who were then matched for age and sex with 113,072 controls without psoriasis from the Taiwan Longitudinal Health Insurance Database 2000. Multivariate Cox proportional hazards models were used for the analysis.

Results: The unadjusted risk of AVN was significantly higher for patients with psoriasis than for controls (hazard ratio [HR] 2.29) and remained significant after adjustment for other risk factors (adjusted HR 1.96; 95% confidence interval 1.62-2.38). The risk for AVN increased in relation to psoriasis severity and was higher for patients with psoriasis and arthritis than for patients without arthritis. The adjusted HRs were higher for male patients than for female patients and for patients younger than 30 years compared with older patients.

Limitations: We lacked information on daily tobacco use, alcohol consumption, and physical activity.

Conclusion: The risk for AVN increased with the disease severity of psoriasis. (J Am Acad Dermatol 2017;76:903-10.)

Key words: avascular necrosis; comorbidities; inflammation; National Health Insurance Research Database; osteonecrosis; psoriasis.

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Conflicts of interest: Dr Tsen-Fang Tsai has conducted clinical trials and received honoraria as a consultant for Pfizer Pharmaceuticals, Serono International SA (now Merck Serono International), UniPharma/Biogen Idec, Galderma, Celgene, Novartis Pharmaceuticals, and Janssen-Cilag Pharmaceutical and has received speaking fees from AbbVie. Dr Chiu has received speaking fees from AbbVie, Janssen-Cilag Pharmaceutical, and Pfizer. The other authors have no conflicts of interest to declare.

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Avascular necrosis (AVN), also known as osteonecrosis, is a progressively debilitating musculoskeletal disease caused by the death of cellular elements of bone. AVN leads to the collapse of the bony structure and is accompanied by pain and loss of function.[1,2] It significantly impairs quality of life and often leads to substantial disability and joint replacement.[1,2] AVN is estimated to be responsible for 5% to 18% of hip arthroplasties.[1-3]

Psoriasis is a chronic, immune-mediated disorder,[4,5] has far-reaching systemic inflammatory effects, and is associated with multiple comorbidities.[4,6-9] Several studies have shown that proinflammatory cytokines also might be involved in the pathogenic mechanisms of AVN and influence its development.[10,11] Some chronic inflammatory diseases, such as systemic lupus erythematosus (SLE), rheumatoid arthritis, polymyositis/dermatomyositis, granulomatosis with polyangiitis, and inflammatory bowel disease,[12,13] are associated with the development of AVN. The proinflammatory cytokines, tumor necrosis factor−α and interleukin-6, which are involved in the pathogenesis of these autoimmune disorders and psoriasis might predispose patients to development of AVN.[11,14,15] Moreover, patients with psoriasis might have a variety of comorbidities and associated conditions, including arthritis, thromboembolic events, vascular occlusion, endothelial dysfunction, abnormal lipid metabolism, use of corticosteroids or cytotoxic drugs, alcoholism, and hyperhomocysteinemia,[1,16-20] which are risk factors for AVN. Previous studies enrolled varying populations and used differing case definitions and found that 6% to 41% of psoriasis patients also have psoriatic arthritis (PsA).[4,21,22] Chronic joint inflammation, such as arthritis, was reported to increase bone loss and collapse, thereby possibly compromising blood supply and increasing AVN risk.[15,23,24]

Although AVN and psoriasis have some pathogenic mechanisms and associated conditions in common, few studies have investigated AVN in patients with psoriasis.[25-27] We therefore assessed AVN risk in a large, nationally representative, population-based cohort of predominantly Chinese patients with psoriasis in Taiwan.

CAPSULE SUMMARY

- Avascular necrosis (AVN) is associated with multiple autoimmune rheumatic diseases.
- Psoriasis was associated with a disease severity–dependent increase in AVN risk, particularly among young adults, males, and patients with psoriatic arthritis.
- AVN should be considered in psoriasis patients with localized pain in a weight-bearing joint.

METHODS

Study design

This retrospective cohort study investigated the association between psoriasis and AVN. Using the National Health Insurance Research Database (NHIRD), we identified 28,268 patients with psoriasis during the period 2004-2006 and then randomly selected 113,072 matched controls without psoriasis from the NHIRD Longitudinal Health Insurance Database. AVN risk was compared between the two cohorts during the study period. This study was reviewed and approved by the local investigational research bureau of National Taiwan University Hospital, Hsin-Chu Branch, Hsin-Chu, Taiwan (103-024-E).

Data source

The NHIRD is an insurance administrative database that is managed by the Taiwan National Health Research Institutes and widely used in academic research. Because Taiwan's National Health Insurance system covers nearly 100% of the nearly 23 million residents of Taiwan, the NHIRD contains abundant data on registration information, demographics, outpatient visits and inpatient services, diagnostic codes, prescription profiles, and surgeries and other procedures for National Health Insurance beneficiaries.

This study used 2 NHIRD datasets to identify patients with psoriasis and the matched controls: (1) the NHIRD datasets on special request, which included claims from the 2,210,612 patients with psoriasis during 2003-2011 and (2) the Longitudinal Health Insurance Database 2000, which included health care information from a randomly selected sample of 1 million beneficiaries in 2000. All subject information was anonymized and de-identified to protect privacy.

Study population

We identified 32,249 patients with a new diagnosis of psoriasis in the NHIRD during 2004-2006 (Fig 1). We excluded patients with missing data on sex or date of birth, those with a medical history of rheumatic arthritis, ankylosing spondylitis, SLE, human immunodeficiency virus infection, or psoriasis,