Radiographic Ischial Enthesopathy in Patients with Psoriatic Arthritis

Häufigkeit der radiologischen Enthesiopathie am Sitzbein bei Patienten mit Psoriasis-Arthritis

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Key words

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ABSTRACT

Background To investigate the prevalence of radiographic ischial entheseal lesions in patients with psoriatic arthritis (PsA) compared to patients with rheumatoid arthritis (RA).

Patients and Methods Thirty-eight patients with PsA and 46 patients with RA were included. Anteroposterior radiographs of the pelvis and lateral foot were evaluated for entheseal lesions. The following entheseal sites were reviewed: os ischium, bilateral Achilles tendon and inferior calcaneus. Abnormalities such as cortical erosions and enthesophytes (irregular bony proliferation) were recorded.

Results The frequency of enthesopathic changes in the ischial region was found to be statistically significantly higher in PsA patients compared with RA patients (50 and 28.3 %, respectively, p = 0.04). Enthesopathic changes of the calcaneus and Achilles tendon also occurred more frequently in PsA patients than in RA patients.

Conclusion Radiographic entheseal lesions in the ischial region are more prevalent in PsA patients compared with RA patients with symptoms in that region. Furthermore, such enthesopathic changes in the ischium are observed as frequently as changes in the Achilles tendon. These findings regarding structural entheseal lesions in the pelvic region contribute to the knowledge of entheseal involvement in PsA.

ZUSAMMENFASSUNG

Ziel Untersuchung der Prävalenz radiologischer Enthesiopathien am Sitzbein bei Patienten mit Psoriasis-Arthritis (PsA) im Vergleich zu Patienten mit rheumatoider Arthritis (RA).

Methode Es wurden 38 Patienten mit PsA und 46 Patienten mit RA in die Studie aufgenommen. Anteroposteriore Röntgenaufnahmen des Beckens und des lateralen Fußes wurden im Hinblick auf enthesiopathische Veränderungen beurteilt. Folgende enthesiale Regionen wurden untersucht: Sitzbein, Achillessehne beidseits und der untere Anteil des Calcaneus. Anomalien wie Erosionen der Kortikalis und Osteophyten (unregelmäßige Knochenwucherungen) wurden dokumentiert.

Ergebnisse Die Häufigkeit enthesiopathischer Veränderungen am Sitzbein war bei PsA-Patienten statistisch gesehen deutlich höher als bei RA-Patienten (50 % bzw. 28,3 %, p=0,04). Enthesiopathische Veränderungen von Calcaneus und Achillessehnen waren bei PsA-Patienten ebenfalls häufiger als bei RA-Patienten.

Schlussfolgerung Radiologische Enthesiopathien am Sitzbein treten bei PsA-Patienten häufiger auf als bei RA-Patienten mit Symptomen in dieser Region. Außerdem treten solche Enthesiopathien am Sitzbein genauso häufig auf wie Veränderungen an der Achillessehne. Diese Befunde hinsichtlich enthesiopathischer Veränderungen im Becken können zum besseren Verständnis der enthesialen Beteiligung bei PsA beitragen.

Background

An enthesis is a location where the tendon, ligament, or joint capsule inserts into the bone. Inflammation of the entheses (enthesitis) is a unique feature of spondylarthritis (SpA) and is important in the identification, diagnosis, and treatment of psoriatic arthritis (PsA) [1]. Apart from physical examination, imaging modalities that can assist in enthesitis are conventional radiography, ultrasonography (USG), and magnetic resonance imaging (MRI) in clinical practice [2, 3]. USG and MRI are shown to be effective in detecting entheseal active inflammation, erosions, and adjacent bone marrow edema; however, one is highly operator-dependent, and the other is a costly method.

Anteroposterior pelvis radiograph (APPR) is the first-step method in cases where SpA is suspected. Many entheseal sites at the pelvis and hip region can be evaluated with APPR; however, little is known about radiographic changes of enthesopathy (RCE) in the pelvis. In our clinical practice, we have frequently observed RCE in ischiums of patients with PsA. We aimed to investigate the prevalence of ischial RCE in patients with PsA, compared to patients with rheumatoid arthritis (RA).

Methods

The files of PsA, and RA patients, who were followed up in Rheumatology Outpatient Clinic, between November 2014 and December 2018, were retrospectively reviewed. PsA and RA patients were classified using the CASPAR and 2010 American College of Rheumatology/European League Against Rheumatism criteria [4, 5]. Available APPRs and lateral foot radiographs of subjects with RA, with matching age and gender, were obtained. In our clinic, radiography is not ordered routinly in patients with PsA who do not have axial complaints. Those radiographs were taken in all patients with complaints of low back pain and heel pain.

The entheseal sites checked were: os ischium, Achilles, and the inferior calcaneal attachment, both the left and right sides. Abnormalities such as cortical erosions, enthesophytes (irregular bony proliferation) were recorded. Suspected cortical irregularities were not recorded. Images were evaluated by two blinded rheumatologists. This study was approved by the university ethics committee.

Data analysis was conducted using the statistical software package IBM SPSS Statistics Version 22.0. Pearson's chi-squared test with bootstrap sampling, stratified according to age and gender, was used for comparisons of categorical variables. Continuous variables were presented as median [Interquartile Range] because of discrepancies with the normal distribution. The Kruskal-Wallis test was used for continuous variables, and when significance was found, pairwise comparisons were made. Spearman's Rho test was used for correlation between two ordinal variables. An A P value with type 1 error probability, less than .05, was accepted as statistically significant in all analyses.

Results

84 patients were enrolled in the study: 38 with PsA (30 women and 8 men), and 46 with RA (41 women and 5 men). ▶ **Table 1** shows their demographic and clinical characteristics.(▶ **Table 2**)

▶ **Table 1** Demographic and clinical characteristics of the study population.

	Patient groups		
Variables	**PsA (n:38)**	**RA (n:46)**	**p-value**
Median age (IQR)	50 [19] # [a]	54 [21][a,b]	0.009 *
Females, n (%)	30 (78.9)	41 (89.1)	0.02
Median disease duration, years (IQR)	4.5 (3)	5 (7)	0.03
BMI (kg/m²) Median [IQR]	29.14 (6.74)	26.29 (7.83)	0.173 *

PsA: psoriatic arthritis; RA: rheumatoid arthritis; IQR: inter-quartile range; * Kruskal-Wallis test; # Pairwise Comparison: Different letters indicate groups that make a difference.

▶ **Table 2** Frequency of radiographic enthesopathic changes in study groups.

	Patient groups		
Enthesopathic changes	**PsA (n:38)**	**RA (n:46)**	**p value ***
Ischium, n (%)	19 (50.0) [a]	13 (28.3) [b]	0.04
Achilles, n (%)	16 (42.1) # [a]	13 (28.3) [b]	0.33
Plantar, n (%)	22 (57.9%)	15 (32.6)	0.06

* Chi-Square Test results with bootstrap sampling, stratified according to age and gender.; # Different letters indicate groups that make a difference.

The frequency of RCE in ischial regions was found to be statistically significantly higher in PsA compared to RA patients (50%, 28.3%, respectively, p = 0.04). Frequency of plantar and Achilles RCE were also higher in PsA patients than in RA patients.

The relationship between the presence of ischial RCE and sacroiliac grades was analyzed using Spearman's Rho test, a nonparametric correlation analysis. A positive and statistically significant correlation was found between the frequency of ischium enthesopathies and the grade of sacroiliitis (r = 0.345; p < 0.05).

Discussion

Enthesitis is one of the first symptoms of PsA and is the most pathognomonic finding that distinguishes PsA from rheumatoid arthritis [6, 7]. Although it has been known for years that enthesitis is an important process in the pathogenesis of PsA, there is still more unknown data regarding enthesitis in PsA, than known data. In short, there is simply not enough data in the literature regarding ischial enthesopathy in PsA. In this study, half of the PsA patients were found to have RCE in ischium. While the ischia are in a sitting position, the plantar regions become the standing

load-bearing areas. Like the Köbner phenomenon that occurs in the skin, in the case of psoriasis, changes in areas subject to stress, such as the enthesis areas in the ischium and plantar fascia, would be an expected finding [8].

The enthesopathy changes most typically visible on a radiograph as enthesitis are new bone formation and bone irregularities. In the CASPAR study, which contains the highest number of patients in the literature on this subject, RCE in PsA patients were compared with AS, RA, and other rheumatic diseases [2]. A significant difference was found between the groups due to enthesopathies in the pelvic region, with the most prominent being found in AS patients. Unlike our study, no difference was found between PsA and RA patients in terms of enthesopathic erosion or new bone formation in the pelvic region in the CASPAR study. The difference between the CASPAR study and the current study may be due to the design of the studies. The CASPAR study was prospective, while the current study was designed retrospectively. It should be noted that the X-rays in the current study were only taken in patients with low back pain and heel pain.

The clinical evaluation of enthesitis is made by determining the amount of tenderness felt in the affected areas during physical examination. In a study involving approximately 800 PsA patients, enthesitis was defined as "clinical tenderness." Achilles, plantar and lateral epicondyle enthesitis were detected in 35 % of these patients [9]. In fact, the incidence of enthesitis can be expected to be higher when considering enthesitis in non-palpable areas. However, detection of enthesopathic changes in areas where palpation cannot be performed is only possible with imaging methods. In this study, the frequency in the ischial region is as common as the RCE seen in the Achilles in patients with PsA. In ischium enthesopathy, pain may develop, especially when sitting on a hard surface or during the movement from sitting to a standing position, which is one of the functions of the muscles that are attached to the ischia.

The weakness of this study is the use of conventional radiography, which shows the damage, but not the inflammation, present in enthesis. It is shown that the use of radiography for diagnosing enthesitis in early PsA is limited [10]. In cases where sacroiliac MRI is required in psoriatic patients, an evaluation of the ischium regions may help to investigate the enthesopathic changes that develop in these regions in the early stages of the disease.

In conclusion, this study has shown that enthesopathic changes can often develop in the ischium of PsA patients with symptoms in the corresponding region.

Author Contributions

AEY conceived of the presented idea. AEY and BB developed the theory and performed the computations. BB and GSD evaluated the radiographs in a blinded way. AA organized the radiographs and evaluated the patient files. MAO performed the statistical analysis. BB wrote the research article. AEY and MAO revised the article. All authors discussed the results and contributed to the final manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest.

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