

Original Article

Comparison of clinical and sonographical findings of Achilles tendon involvement in newly diagnosed and established cases of psoriasis

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Abstract *Objective* To compare the clinical and sonographical findings of Achilles tendon involvement in newly diagnosed (disease duration <6 months) and established psoriatic patients (disease duration >5years).

Patients and methods This cross-sectional, comparative study was carried out in Departments of Dermatology and Radiology, Military Hospital, Rawalpindi, over a period of six months. 70 patients of psoriasis were divided into two groups comprising 35 patients in each. Group I patients were newly diagnosed cases while group II included the established psoriatic patients. All patients with clinical and histological evidence of psoriasis were included. Patients with history of osteoarthritis, rheumatoid arthritis or foot trauma were excluded. Detailed history and complete clinical examination was carried out as per pro forma. The condition was considered symptomatic when there was tendon swelling, pain, tenderness or functional impairment. Ultrasound of Achilles tendon was done, keeping patient in prone position by using Pro Sound SSD 5500 Toshiba ultrasonographic machine with high frequency probe (7.5MHz) to assess findings of Achilles tendon in psoriatic patients. Fibrillar tendon structures, tendon thickness, peritenon, and bursae were evaluated.

Results On clinical assessment 1 (2.8%) patient in group I and 5 (14.3%) patients in group II had Achilles tendon involvement. On ultrasonographic assessment, 3 (8.5%) patients in group I and 15 (42.8%) patients in group II showed involvement of Achilles tendon ($p < 0.05$).

Conclusion Achilles tendon involvement occurs in significant number of patients with long standing psoriasis as compared to newly diagnosed cases. It also revealed that enthesitis progresses with the duration of disease.

Key words

Achilles tendonitis, psoriatic arthritis, early and late onset psoriasis.

Introduction

Psoriasis is a common, genetically-determined,

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Immune-mediated, inflammatory and proliferative disease of skin, the most characteristic lesions consisting of chronic, sharply demarcated, dull red, scaly plaques particularly on the extensor prominences and in the scalp.¹

Psoriatic arthritis is an inflammatory rheumatic disease associated with psoriasis and commonly included among seronegative forms of spondyloarthropathy.² It has immunological basis and resembles rheumatoid arthritis.^{3,4} It is clinically characterized by involvement of joints, tendons and entheses.⁵ As therapy has evolved for the treatment of both psoriasis and psoriatic arthritis, there has been an increasing awareness of the need for both dermatologists and rheumatologists to recognize the clinical features of both conditions and to either initiate therapy or to refer for appropriate care at the earliest. Unfortunately, therapy directed separately at each disease, in a patient who suffers from both, may lead to the use of multiple medications and increases the risk of toxicity. So a conceptual and integrated approach is required.

Molls and Wright's⁶ criterion is most commonly used in the diagnosis of psoriatic arthritis; however this criterion seems inadequate for defining the full spectrum of the disease, because they did not include isolated peripheral enthesitis, which has been suggested as a characterizing subset of patients with psoriatic arthritis.⁵ Particularly Achilles tendonitis is fairly common and is reported in 10-30% of psoriatic patients.⁷ Patients complain of severe foot pain and difficulty in walking whereas clinical examination shows swelling and tenderness along the course of tendon and at the calcaneal insertion.⁵ In addition, while it is normally considered a benign condition, more recent studies have revealed that progression of the arthritis is associated with a moderate increase in morbidity. Disability (in some cases permanent) is not uncommon.⁸ Since the condition can be controlled effectively, the early diagnosis becomes more important to initiate appropriate therapy in time.

Radiographic demonstration of joint involvement is still the gold standard for definitive diagnosis of psoriatic arthritis. However, an increasingly important role is being played by ultrasonography, in part because of its widespread availability, safety, non-invasiveness and low costs. Ultrasonography is a useful tool for superficial soft tissue evaluation because it allows visualization of structures such as joints, bursae, and muscles as well as soft-tissue lesions, such as synovitis.⁹ Ultrasonographic examination of the joints that are potential targets of psoriatic arthritis can reveal structural alterations in the initial stages of the disease, before joint symptoms and clinically appreciable articular involvement have taken place.

Psoriasis and its complications are fairly common and have worldwide distribution. The Achilles tendon involvement is among one of its complications, which is mostly overlooked, which could be considered among the earlier signs of the potentially aggressive disease, psoriatic arthritis. The study was designed and performed to determine the involvement of Achilles tendon in psoriasis (newly diagnosed and established cases) at Military Hospital, Rawalpindi to evaluate the burden of disease in our demographic setting. There is paucity of local literature on the subject and is the first study of its kind in Pakistan. Clinical and ultrasonographic evidence of Achilles tendon involvement in newly diagnosed and established psoriatic patients was sought and results of these findings were correlated.

Patients and methods

Cross sectional Comparative study of six months duration was conducted at Department of Dermatology and Department of Radiology, Military Hospital Rawalpindi. Seventy patients suffering from psoriasis were selected by

purposive convenient sampling technique for the study. Source of patients was from the outpatient and indoor patients of skin department of Military Hospital Rawalpindi. All patients with clinical and histological evidence of psoriasis were included. Patients with history of osteoarthritis, rheumatoid arthritis or foot trauma were excluded. Informed consent from patients recruited in the study and approval from the ethical committee of the hospital was sought. Patient's personal information was kept confidential.

Detailed history and complete clinical examination was carried out as per proforma. The condition was considered symptomatic when there was tendon swelling, pain, tenderness or functional impairment. Ultrasound of Achilles tendon was done, keeping patient in prone position by using Pro Sound SSD 5500 Toshiba ultrasonographic machine with high frequency probe (7.5MHz) to assess findings of Achilles tendon in psoriatic patients. The tendon was imaged with the probe perpendicular to the tendon surface. Fibrillar tendon structures, tendon thickness, peritenon, and bursae were evaluated.

The data were analyzed using SPSS 10 software. Mean and standard deviation were calculated for age and thickness of Achilles tendon. Frequencies were calculated for clinical and ultrasonographical findings in both the groups. Chi square test was used to compare the clinical and ultrasonographical findings, and the data was presented in tabular and graphic forms. *p* value of <0.05 was considered as statistically significant.

Results

A total of 70 patients of psoriasis were included. In group I (n=35), the mean age of patients was

31.9 ±11.5 years (13-60 years) while in group II, the mean age was 40.5 ± 11.6 years (range 21-67 years). Clinical and sonographical findings of Achilles tendon involvement of both groups are as under.

Group I One (2.8%) of the 35 newly diagnosed had symptoms of Achilles involvement at clinical evaluation but 3 (8.5%) had ultrasonographic alterations. The mean value of sagittal tendon thickness was 5.26±.67mm in this group (**Table 1**).

Group II Clinical evaluation showed Achilles tendon abnormalities in 5 (14.3%) of the 35 patients and normal findings in the other 30 (85.7%) patients. In contrast, pathologic ultrasonographic changes were detected in 15 (42.8%) patients. Of the 5 patients with symptoms, 4 (80%) had ultrasonographic abnormalities, whereas 1 (20%) had normal scans (**Table 1**). The mean value of sagittal tendon thickness was 5.69±1.036mm.

The most frequent ultrasonographic finding among the 15 patients with ultrasonographic signs of involvement was degenerative tendinitis in 11 (73.3%) patients. In 2 (13.3%) of these patients, it was associated with acute tendonitis and 2 (13.3%) patients had bursitis. In 11 (73.3%) patients it was an isolated finding. One (6.6%) patient had partial tendon rupture. Clinically, the most common symptom was pain and tenderness at the site of Achilles tendon.

An interesting finding was the equal incidence of acute tendinitis and bursitis in the two patients each with symptoms and with abnormal scans. The ultrasonographic findings did not correlate either with the activity of the cutaneous disease (as reflected by the psoriasis area and severity Index score) or with the local or systemic therapy being administered.

Table 1 Comparison of clinical and ultrasonographical findings results.

Group	Clinical involvement N (%)	Sonographical involvement N (%)	p value
Group I n=35	1 (2.8)	3 (8.5)	0.198
Group II n=35	5 (14.2)	15 (42.8)	<0.001

Discussion

The relationship between psoriasis and inflammatory arthritis has been well recognized since the 19th century and named as psoriatic arthritis.¹⁰ Epidemiological and clinical investigations suggest that the disease is a unique arthropathy rather than the coincidence of two common diseases. Clinical subgroups have been proposed and have proved useful in study of the disease (psoriatic arthritis); however, there are inconsistencies and overlaps in the published data. The population prevalence of psoriatic arthritis is in the range of 2-10 per 10000 although this is probably an underestimate as those with sacroiliac involvement only are not included. In 2002 National Psoriasis foundation survey, persistent joint pain or stiffness was found in 31% of patients with psoriasis, indicating that many patients may be unaware of their disease. 5% to 42% of psoriasis patients develop psoriatic arthritis.¹¹ In 10-15% of cases, inflammatory involvement of the joints occurs with symptoms of arthritis. The arthropathy generally develops many years after the onset of the disease.¹² Recently presented data indicate that its prevalence has been greatly underestimated, and may be as high as 25% in people with psoriasis. In about 10% of people with psoriatic arthritis, the arthritis appears before skin manifestations of psoriasis.^{5,8}

Psoriatic arthritis is a form of seronegative arthritis that can complicate the course of psoriasis and evolve toward deforming and highly disabling pattern of arthropathy. Although clinical involvement of tendon and entheses is common in patients with psoriatic arthritis, it has not been included among the Moll and Wright's criteria, which is widely used to diagnose and classify the disease. By contrast, clinical involvement of tendon and entheses is among the diagnostic criteria of both the European spondyloarthropathy study group and among those proposed by Amor *et al.*⁸ Authors of one study also advocate that patients with isolated peripheral enthesitis or dactylitis be considered a subset of psoriatic arthritis.⁵ Achilles tendon is among the most frequent sites of enthesopathic involvement in psoriatic arthritis, producing soft-tissue inflammatory swelling, heel pain, and difficulty in walking.⁵ Imaging techniques such as ultrasonography and magnetic resonance imaging have shown that enthesitis can be asymptomatic and that some cases of Achilles tendinitis can go undiagnosed on clinical evaluation. In particular, ultrasonography is a sensitive, safe, noninvasive and cost-effective method for detecting superficial soft-tissue abnormalities that can be missed at clinical examination.⁷

The study was performed to seek clinical and ultrasonographic evidence of enthesitis of the insertion of the Achilles tendon by dividing the subjects into two groups. Group I, of 35 newly diagnosed psoriatic patients and group II established psoriatic patients. The clinical findings correlated with ultrasonographic findings in each group. We focused on the Achilles tendon because it is very thick, is readily accessible to ultrasonographic imaging, and is the tendon most commonly involved in psoriatic arthritis.¹³ Ultrasonography allows

visualization of lesions less than 5 mm in diameter and identification of minimal amounts of fluid at the level of the tendon, peritendinous structures, peritenon, and serous bursae. The high sensitivity and specificity of ultrasound examination allow its use as a complementary procedure when clinical examination yields normal findings because the signs of involvement are mild and may not be accompanied by specific symptoms.

On clinical examination the most common finding encountered was pain and tenderness along the Achilles tendon. On USG, we found evidence of involvement of the Achilles tendon in 15 out of 35 patients of group II, whereas clinical examination in the same group showed involvement in 5 patients. Data analysis showed that the most common findings were degenerative lesions. Enthesitis was probably the cause of the pain experienced by most of these patients.

One patient who reported heel pain and was therefore included among the patients with symptoms did not have evidence of Achilles tendon changes at ultrasonography. In this case, the clinical manifestations might have been caused by involvement of structures that were not evaluated (plantar fascia or calcaneus spur). The results of the present study suggest that ultrasonography constitutes a sensitive and accurate method for the diagnosis of Achilles tendon involvement, which is a subset of psoriatic arthritis. Two patients in group II were having psoriatic arthritis; both showed enthesopathic abnormalities at ultrasonography.

In 2003, De Simone *et al.*² compared sonograms of the Achilles tendon in 59 patients with psoriatic plaques and 50 healthy subjects in an attempt to identify correlations between clinical and sonographical features. An analysis of their

findings led these authors to conclude that Achilles tendon abnormalities cannot be excluded, even in the absence of clinical manifestations. Another recent study was published in 2006 by Fournie.¹⁴ It was a prospective comparison of power Doppler findings in 25 fingers with rheumatoid arthritis and the same number of fingers with psoriatic arthritis. They found that erosive synovitis and tenosynovitis were present in both groups. However, in 84% of the cases of psoriatic arthritis, there were also extrasynovial changes (enthesophytes, periosteal reactions, flexor enthesopathies, soft-tissue thickening), which were not observed in any of the cases in the other group. All of these inflammatory changes were manifested on power Doppler by the classical signs of hyperemia. The authors concluded that Doppler sonographic evidence of inflammation involving the fibrous skeleton of the fingers can be used to differentiate psoriatic arthritis from rheumatoid forms; it should at least raise the suspicion of psoriatic joint involvement, which can then be evaluated with radiologic studies and laboratory analyses.

The smaller sample size and lack of histopathological correlation of Achilles tendon involvement with the clinical and USG findings are the limitations of this study. However, to the best of our knowledge, this is the first study where ultrasonography imaging was used to evaluate early involvement of Achilles tendon in psoriasis in Pakistan. Further studies using MRI are needed to evaluate foot involvement in psoriatic patients. Also, comparison of the MRI findings with radiographic and histopathological findings will be valuable.

Conclusion

Psoriatic arthritis can lead to deforming and debilitating joint disease. USG imaging may

have the advantage of early diagnosis warranting the initiation of treatment before the significant structural damage occurs. Our data suggests that the incidence of Achilles tendon involvement is relatively high in patients with established psoriasis.

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