DOI: https://doi.org/10.53350/pjmhs211561259

ORIGINAL ARTICLE

Association between Achilles and Plantar Calcaneal Spur in Pakistani Population Presenting with Ankle/Heel Pain

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ABSTRACT

Aim: To evaluate the prevalence and associationbetween Achilles and plantar calcaneal spurs in Pakistani population.
Study design: Cross sectional study.
Place and duration of study: The study was conducted in the radiology department Combined Military Hospital Lahore from October 2020 to December 2020.
Methodology: Three hundred and thirty five patients were enrolled. The age and sex of the patients were recorded. Lateral foot and/ or ankle radiographs were evaluated for presence of calcaneal spurs.
Results: Mean age 38 years.There were 268 (80%) males and 67 (20%) females. 30.7% patients had a calcaneal spur in our population irrespective of age and gender. 13% patients had both posterior and inferior calcaneal spurs. There was higher prevalence of inferior calcaneal spur irrespective of age and gender.Posterior calcaneal spur was seen in 20% of males and in 15% of females. A total of 44 (68%) patients with posterior plantar spur were found to have a concomitant inferior calcaneal spur.Inferior calcaneal spur was seen in 25% of males and in 28% of females and positive correlation between posterior and inferior calcaneal spurs.
Conclusion: There is a high prevalence of calcaneal spurs, which increases with advances of age. Inferior calcaneal spurs tend to be more prevalent in females. Furthermore, there is a significant association between the presence of posterior calcaneal spurs and the concomitant inferior calcaneal spurs.
Key words: Achilles, Plantar, Calcaneal, Spur

INTRODUCTION

Heel pain is a very common symptom among the general population.[1] it greatly affects the quality of life. Among other etiologies, calcaneal spurs are the most prevalent factor producing heel pain.

Calcaneal spurs are outgrowths of bone from the posterior and inferior aspect of calcneum that arise in the tendon of Achilles tendon and plantar fascia respectively.[2] These bony outgrowths have thus also been also referred to as enthesopathic changes as they develop in the attachments of above-mentioned tendon and fascia into the bone. Calcaneal spurs have also been demonstrated in the infants, disappearing by the first age of life[3].

Various etiologies have been associated to their origin. Most notable pathophysiologies for the formation of inferior calcaneal spur are the traction and compression theories.[4] Traction theory illustrates that the inflammation of the respective tissues pulling the enthesis of the bone towards them. The compression theory describes the formation of spurs in response to stress fractures of the calcaneum due to repetitive compression of the heel. In summary, posterior spurs are usually the result of sustained activities while inferior spurs from due to prolonged standing and walking[5].

There is a high incidence of spurs in the normal population hence they being an incidental finding on radiographs, CT or MRI examinations for other ankle or foot related indications[6]. They are most detected on a lateral foot or ankle radiograph. There can be associated findings of soft tissue calcifications and swelling denoting inflammation of the Achilles tendon and plantar fascia.

Calcaneal spurs can either be symptomatic or asymptomatic. There is a higher frequency of calcaneal spur in symptomatic population as is described by previous studies.[7] Calcaneal spurring has also been associated with other disease processes including entrapment of plantar nerves and subsequent atrophy of muscles like adductor digits minimi[8].

It has been previously noted that posterior calcaneal spurs are more common than inferior spurs and that they often present with the latter in the general population. In our knowledge there has been only one study in this regard, done by Volcano et al.[9] We intend to further proof this association and describe the frequency of calcaneal spurs in our population.

MATERIALS AND METHODS

This prospective study was carried out in Diagnostic Radiology department of CMH Lahore from 1st October 2020 to 31st December 2020 and comprised 335 patients. Lateral foot and ankle radiographs of patients presenting with ankle and heel pain were analyzed. Those patients with ages above 15 years were included in the study.

Received on 09-02-2021
Accepted on 03-06-2021

Those patients with history of trauma, or prior surgeries involving the ankle joint, and foot were excluded. This research was approved by Ethical Committee.

The age and sex of the patients were recorded. Ages of the patients were grouped into <15, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74 and 75+ years. Lateral foot and/ or ankle radiographs were evaluated for presence of posterior and inferior calcaneal spurs. The calcaneal spurs obtained is shown in figure 1. Presence or absence of posterior and inferior calcaneal spurs was reported for both genders and all ages. SPSS version 23 was used to calculate frequencies of posterior and inferior calcaneal spurs according to age and sex of the patients. Association of posterior and inferior calcaneal spurs was also evaluated using Pearson Chi-Square taking p<0.05.

Fig. 1: Patient with both posterior and inferior calcaneal spurs

RESULTS

The ages of the patients ranged from 15 years to 80 years. Mean age of patients was 38 years with a standard deviation of 14 years. There were 268 (80%) males and 67 (20%) females, with 60% more males attending the radiology department for lateral radiographs of foot and/ or ankle. A total of 103 patients had a calcaneal spur in our population irrespective of age and gender, giving a 30.7% overall prevalence. There were 44 (13%) patients who had both posterior and inferior calcaneal spurs. 65 (19.5%) patients had a posterior calcaneal spur. The lowest age of presentation was 22 years. Posterior calcaneal spur was seen in 20% of males and in 15% of females. Highest number was found in 35-44 age group- 28.9%. A total of 44 (68%) patients with posterior plantar spur were found to have a concomitant inferior calcaneal spur. 87 (26%) patients had an inferior calcaneal spur. The lowest age of presentation was 24 years. Inferior calcaneal spur was seen in 25% of males and in 28% of females. Highest number was found in 45-54 age group- 36.7%. A total of 44 (50%) patients with inferior plantar spur were found to have a concomitant posterior calcaneal spur (Table 1).There is a significant (P<0.05) association between posterior and inferior calcaneal spurs (Table 2).

Table 1: Comparison of age according to gender

Age (years)	Gender			
	Male		Female	
	Posterior	Inferior	Posterior	Inferior
<15	-	-	-	-
15-24	1 (2.2%)	1 (1.7%)	-	-
25-34	10 (15.6%)	10(11.7%)	-	-
35-44	17 (26.7%)	17 (20%)	-	1 (1.7%)
45-54	10 (15.6%)	20(23.3%)	6 (8.9%)	12(13.3%)
55-64	9 (13.3%)	12(13.3%)	-	1 (1.7%)
65-74	6 (8.9%)	6 (6.7%)	2 (2.2%)	2 (2.4%)
>75	1 (2.2%)	2 (1.7%)	3 (4.4)	3 (3.3%)

Table 2: Association between posterior and inferior calcaneal spurs

Inferior	Posterior		Total
	Positive	Negative	
Positive	44	43	87
Negative	21	227	248
Total	65	270	335

χ^2 = 2.78 df = 2 P = 0.05

DISCUSSION

Mean age of patients in our study was 38 years. Kuyucu et al[10]evaluated symptomatic patients only like our study with a mean age of 47 years. Vulcano et al[9]used both symptomatic and asymptomatic patients in their sample with a mean age of 56 years. According to Beytemur et al[6], there is a higher prevalence of spurring with increase in age. In our study, there was increasing incidence of either and both posterior and inferior calcaneal spurs with increasing age.

There is a high prevalence of calcaneal spurs in the normal population. Overall prevalence of calcaneal spurs according to Toumi et al[5] was 38%. Our study however revealed a lower prevalence of calcaneal spurs in the Pakistani population. Patients with both posterior and inferior calcaneal spurs were 13% in our study correlating well with the frequency of 11% according to Toumi et al.[5]

In symptomatic (heel pain) population Lourdes et al[11] reported a frequency of 98%. Osborne et al[12] also reported a higher prevalence of calcaneal spur in people with symptoms as compared to asymptomatic population reaching up to 83%. Similar results have been demonstrated by Johal et al.[13]

Inferior calcaneal spurs were more common in women according to Toumi et al.[5] In the present study, there was an insignificant variation in the prevalence of calcaneal spur according to both genders. Incidence of calcaneal spurs have been reported as being higher in females by Vulcano et al.[9] However, Beytemur et al[6] shows no significant association between prevalence of calcaneal spurs and gender.

We have shown that there is a predilection of inferior calcaneal spurs in females while posterior calcaneal spurs in males. Toumi et al[5] also shows a higher percentage of inferior calcaneal spur in females.

There is a higher prevalence of posterior calcaneal spurs as compared to inferior as reported by Beytemur et al.[6]However our study showed a higher prevalence of

inferior calcaneal spur formation in the Pakistani population.

This study showed a significantassociation between posterior and inferior calcaneal spurs. 68% patients with posterior plantar spur were found to have a concomitant inferior calcaneal spur in our study. This correlates well with the findings provided by Volcano et al.[9]

CONCLUSION

There is a high prevalence of calcaneal spurs in both genders which increases with advances of age. Inferior calcaneal spurs tend to be more prevalent in females. Furthermore, there is a significant association between the presence of posterior calcaneal spurs and the concomitant inferior calcaneal spurs.

Conflict of interest: None

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