

PREVALANCE AND ASSOCIATED RISK FACTORS FOR PLANTAR FASCIITIS AMONG SECURITY FORCES PERSONNEL IN PESHAWAR

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Abstract

Objectives: To find out the prevalence and factors related with plantar fasciitis in security force of Peshawar

Methods: Cross-sectional survey was conducted to find out the prevalence of plantar fasciitis in police force of Peshawar, Pakistan. We obtained our targeted sample of 364 was obtained from 12 police stations using convenience sampling. Data was analyzed through SPSS version 20.

Result: The estimated occurrence of heel pain came out to be 10.6%. Among them the prevalence of plantar fasciitis was 13.2%. Age, obesity, foot wear, foot deformity, standing duty hours and the type of job were among the risk factors.

Conclusion: The condition was found to have low prevalence. Age group 20-40, hard shoe wear, field-work and prolonged standing (more than eight hours) were found to have strong association with the condition.

Key Words: Plantar fasciitis, heel pain, security forces, prevalence.

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INTRODUCTION

Plantar fasciitis is a common pathology with the major complaint of plantar heel pain, most frequently occurring due to localized inflammation of the plantar aponeurosis, with tender and painful medial tubercle of calcaneum.^{1,2} It is reported to account for 11% to 15% of all adult foot complaints that require professional attention.³ It was found to occur relatively frequently in security forces personnel and athletes especially younger males and middle-aged women.^{2,4} The incidence rate of plantar fasciitis in US military population was 10.5/1000 persons per year with highest incidence rate who are 30 years of age or older.⁵ Plantar fasciitis has unknown clinical course with 5 to 10 percent of patients' with severe problem progress to surgery, while huge number of cases resolve within 6 to 18 months by conservative therapy, directing some to suggest that plantar fasciitis represents a self-limiting condition.⁶ The classical presentation is with symptoms that are worst while taking the first few steps after getting out of bed, sitting for longer periods of time and at the beginning of weight bearing activities.^{7,8} The pain type

reported is mostly stabbing, sharp and burning.^{7,9}

The actual cause of plantar fasciitis is poorly understood and is attributed to many factors which can be categorized as intrinsic and extrinsic.^{7,10} Intrinsic being biological and anatomical with factors such as increasing age, increasing body mass index (BMI) classified as biological while limited ankle dorsiflexion, leg length discrepancy, increased plantar fascia thickness, pes planus (excessive pronation of the foot/low arched), cavus (high arched) foot and heel spur as anatomical lacking.^{4,6,7,10,11} Postulated extrinsic factors include prolonged weight bearing, improper shoe fit and wear, previous injury, running variables such as surface (uneven or even), speed, frequency, distance, time per week and sedentary lifestyle but evidence for most of these factors is lacking.¹²⁻¹⁶

In Pakistan, there is increased burden on security forces from the past few years due to security situation. These circumstances have led to heighten the physical demands expected of them including long time standing hours and walking on cambered surfaces making them susceptible towards the

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development of plantar fasciitis. So this study addresses the prevalence and factors related with plantar fasciitis in security force of Peshawar.

METHODS

Cross sectional survey was conducted estimating the prevalence of plantar fasciitis in police force of Peshawar, Pakistan. There were 51 stations in the district Peshawar with total police force of 7000. Sample size was calculated with sample size calculator and came out to be 364. Targeted sample size was obtained from 12 police stations using convenience sampling. Permission letter and information sheet were given to the station heads and the directors of the schools to obtain approval and make them aware about the purpose and procedure of the project. Questionnaire designed was comprised of 2 sections: Demographic characteristics and symptoms and risk factors. The symptoms and factors section was schemed by modifying two surveys which were taken from Survey Monkey Inc. [US] (<https://www.surveymonkey.com/r/R8BZ6DN>) and diagnosis from health grades (http://www.rightdiagnosis.com/symptoms/heel_pain/questions.htm). Only males were included in the study because of their tough field job and relatively their increased susceptibility for the condition

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as compared to females. The participants excluded were those having any previous injury (bullets, accidents) and systemic diseases (Diabetes, Inflammatory joint disease and Reiter's syndrome). Information sheet, consent form and questionnaire were handed to the

participants in hard copy. Basic intention of the questionnaire was to find out the presence of heel pain. Those who had positive result for heel pain were further physically examined specifically designed for plantar fasciitis diagnosis. For the analysis, the collected data was entered

on SPSS version 20. Counts and percentages was used to describe the frequency distributions, while Chi-square test was used for comparisons of categorical variables. P value < 0.05 & Confidence interval 95% was taken as significant for result.

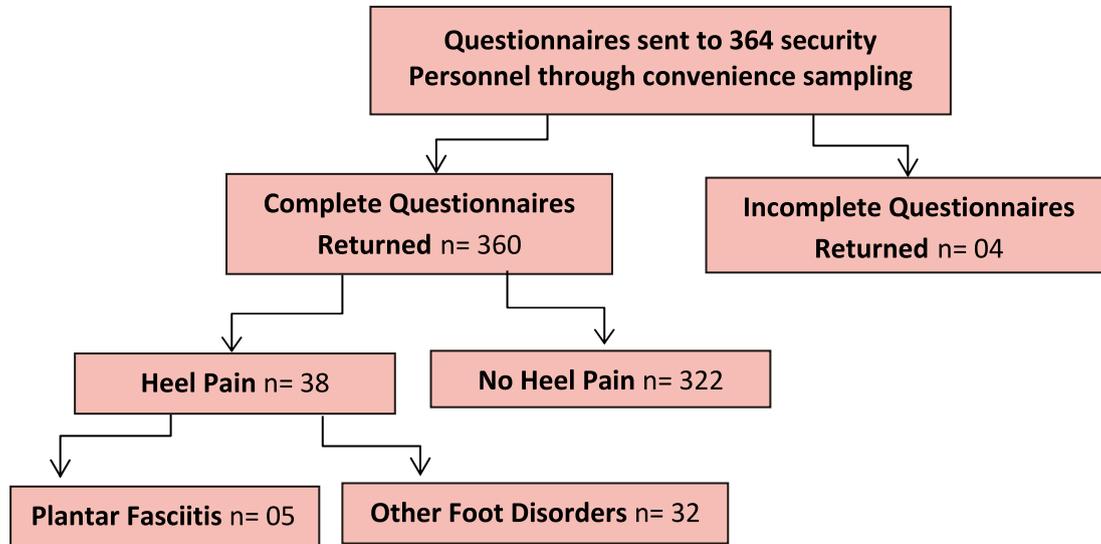


Figure 1 : Flow chart of study design and Outcomes

RESULTS

Out of 364 patients, 360 cooperated well and 4 left the questionnaire incomplete. From those who responded, 38 had heel pain. The physical exam of individuals with heel pain revealed that 5 of 38 had plantar fasciitis. From collected data, the estimated occurrence of heel pain was 10.6% while plantar fasciitis was 1.38%. Among heel pain subjects the prevalence of plantar fasciitis was 13.2%. Analyses of pain type in inferior heel concluded sharp pain reported in 39.5%, burning pain in 23.7%, stabbing pain in 21.1% and throbbing in 15.8%.

Weight bearing/standing was the most complained aggravating factor with a

percentage of 31.5% followed by walking on uneven surface (24.6%), going up and down stairs (17.8%), walking on flat surface (16.4%) and the least common was lying on bed (9.5%). Similarly, the percentages calculated for the relieving factor showed medication (31.5%), stretching and splinting (28.9%), walking and supportive footwear both (18.4%) and the least used was icing (2.6%). Symptoms included standing after sitting which accounted 36.8%, pain at night 31.6%, both symptoms with a value of 23.7% and stepping out of bed was 7.9%. Analysis of age as a risk factor showed that the age group ranging from 31-40 years accounted for 36.8%. Obesity posed 15.8% risk for causing the plantar fasciitis

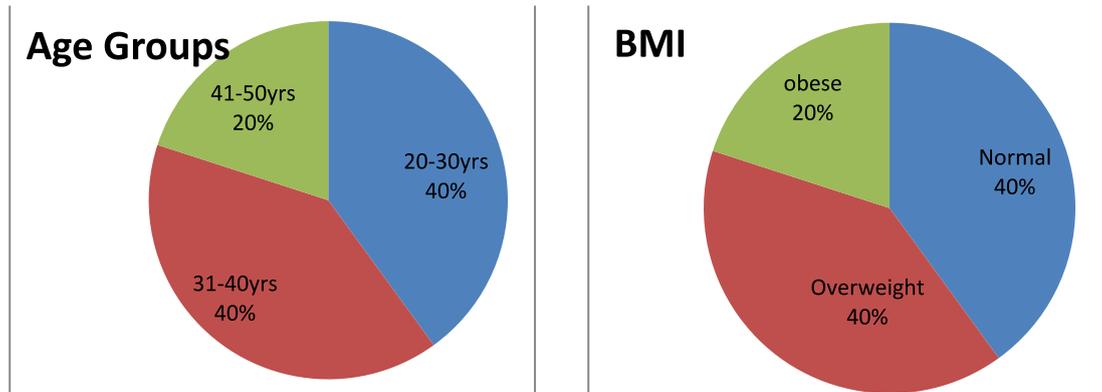
(Figure 2,3). Field workers were at a greater risk for both heel pain and plantar fasciitis with the values 89.5% and 100% respectively. Long standing duty time more than eight hours exposed 76.3% individuals to heel pain and of those with plantar fasciitis was 80%. Shoes type was also considered to be a risk factor. Hard shoe was of greater percentage at 71.1% for heel pain. Foot deformities are also a major contributor to heel pain giving a value of 50% risk with p value of 0.288 (26.3% with low arch and 23.7% with high arch). (Table 1,2)

Table 1: Foot Deformity and Plantar Fasciitis

Foot deformity & Plantar fasciitis					
			Plantar fasciitis		Total
			Yes	No	
Foot deformity	High arch	Count	0	9	9
		Percentage	0.0%	27.3%	23.7%
	Low arch	Count	1	9	10
		Percentage	20.0%	27.3%	26.3%
	Normal	Count	4	15	19
		Percentage	80.0%	45.5%	50.0%
Total	Count	5	33	38	
	Percentage	100.0%	100.0%	100.0%	

Type of shoe & Plantar fasciitis					
			Plantar fasciitis		Total
			Yes	No	
Type of shoe	Soft	Count	1	10	11
		Percentage	20.0%	30.3%	28.9%
	Hard	Count	4	23	27
		Percentage	80.0%	69.7%	71.1%
Total		Count	5	33	38
		Percentage	100.0%	100.0%	100.0%

Table 2: Shoes type and Plantar Fasciitis



DISCUSSION

This study aimed to find out prevalence and its associated risk factors of planter fasciitis among security personnel. Out of 360 participants only 5 had planter fasciitis which comprised 13.2% of the people with heel pain, which were 10.6%. An antecedent study showed that plantar fasciitis remained an important public health disorder as 10% of the population presented with heel pain over their lives where 83% of the patients were active working adults.^{5, 17} In another preceding study the prevalence of heel pain was estimated to range from 3.6 % to 7%and the disorder has been reported to account for about 8% of all running related injuries.¹⁸⁻²²

Focused risk factors included age, BMI, foot deformities, long duty hours and type of foot wear. Age ranged from 31-40 years was found to be more affected about 36.8%. In a prospective study on plantar fasciitis, the average age of the patients who had heel pain (47.5 years) was found to be nine years older than that of those without heel pain (38.4 years).^{5,23} Another study showed that said condition had been reported to peak between 40 to 60 years of age.^{11,20} Association between obesity and said problem was 15.8% in

our study. A remote study showed that increased body weight and increased BMI had been shown to be significant risk factor for plantar fasciitis.^{13,23,24} A BMI of more than 30 had an odd ratio of 5.6(95% confidence interval, 1.9 to 16.6; p <0.01) compared with a BMI of less than 25.² Frey and Zamora demonstrated a 1.4 fold increased probability of plantar fasciitis being diagnosed in an overweight or obese patient.²⁵On the contrary Rome et a suggested that BMI is not related to plantar fasciitis pain in athletic population.^{20,26}

Correlation between the disorder and foot deformities showed a value 26.3 % persons with low arch and 23.7% with high arch while clinical association between heel pain and high arched foot had been made but the role of pes planus foot types and foot pronation in the development of plantar fasciitis had been shown.^{6,27,28}Another contributor to heel pain was prolonged standing duty hours, with 73.6% in those who were exposed to more than 8 hours but those who developed plantar fasciitis due to the said factor were 80%. A previous case control study reported that a significantly greater number of cases answered 'yes' when asked if they were typically 'on their feet for majority of day' (76% versus 47%, p

< .05). Odds ratio calculation reported that who answered "YES" were 3.6 time more likely to develop chronic plantar heel pain compared to those who answered "NO".^{2,7} Several studies also mentioned an association between work related prolong weight bearing and plantar fasciitis.^{2,29} Lapidus and Guidotti also highlighted a predominance of occupations that necessitated continual standing or walking.⁵ Among considered risk factors, type of foot wear also played an important role in developing heel pain, about 71.1%. A study revealed that person wearing soft sole shoe verses hard shoes during standing or walking reduced foot swelling from 2.2% to 1.2%.³⁰ A study stated that changes in general foot wear had been associated with over load of plantar fasciitis leading to micro tears, especially rigid foot wear may have exacerbated the plantar fasciitis in such patients.^{20,29} Amongst aggravating factors, weight bearing seemed to be major factor, with weightage of 31.5 %. A study reported that typical individual stricken with Plantar fasciitis were mostly afflicted upon initiation of ambulation, after arising from sleep.³¹ Another study revealed that patient usually presents pain at initiation of weight bearing, either in morning arising or after long period of rest.^{4,32}

Focusing on this problem will create awareness regarding plantar fasciitis and its impact on the level of functioning required from the forces. Pakistan being at the verge of terrorism, needs an efficient security force system. The present study gives an opportunity to future researchers to look for the possible causes of the condition to minimize its occurrence. The matter can be dealt efficiently by decreasing the duty hours, modifying footwear and decreasing the weight bearing time by alternating the work period.

CONCLUSION

Although the condition has very low prevalence but tackling with the factors causing it can help eradicate the emergence at early point in time. The individuals, who have been exposed to the risk factors but have not yet developed the condition, can be prevented from it by addressing the issues leading to the said complaint. Age group 20-40, hard shoe wear, field-work and prolonged standing (more than eight hours) were found to have strong association with the condition.

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