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# Modifiable Risk Factors Associated with Heel Pain in Indian Population – An Observational Study

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| Keywords | Abstract:   |  |
|----------|---|--|
|          | Introduction: Heel pain, is a common complaint of many patients who requiring professional              |  |
|          | orthopedic care and are mostly suffering from chronic pain beneath their heels. The aim of this study   |  |
|          | is to study the modifying risk factors related to heel pain   |  |
|          | Materials and Methods: This observational study is an analysis of all the common risk factors           |  |
|          | associated with heel pain to differentiate the modifying from the non- modifying factors that are       |  |
|          | associated with heel pain and to establish better patient care through gradual lifestyle changes in 200 |  |
|          | patients between June 2021 to July 2022.  |  |
|          | Result: Out of 200 patients 119 were female and 81 were males. The youngest patient of the study        |  |
|          | was 10 years of age and oldest being 55 years old. The Mean age was 30.5 years. We observed that        |  |
|          | the age group 31-40 years was commonly affected than others. The Right-side heel pain found to be       |  |
|          | most commonly involved in this study. We found maximum number of patients belonging to farmer,          |  |
|          | daily wage workers (labourers). We found maximum number of patients belonging to 25.0-29.9              |  |
|          | kg/m2. The most common associated comorbidity in our patient was Hypothyroidism.                        |  |
|          | Conclusion: The identification and differentiation of the modifiable and non-modifiable                 |  |
|          | demographic factors such as age, gender, side involvement, Body Mass Index (BMI) and occupation         |  |
|          | of the patient helps us to have a deep understanding of the disease and its further management          |  |
|          | resulting in establishing a better patient care.  |  |

### **INTRODUCTION**

Heel pain is a common symptom in the general population. The etiology of heel pain varies with age and location and is primarily connected to diseases of the Achilles tendon and surrounding tissues [1]. The most frequent cause in kids and teens is calcaneal apophysitis, sometimes known as severe's disease. Adults with midportion posterior heel discomfort are likely suffering from Achilles tendinopathy; on the other hand, insertional pain could be the result of retrocalcaneal bursitis, enthesitis, or Haglund's deformity [2,3]. Achilles tendinitis usually has no connection to a particular type of injury. The tendon is under constant stress, which is the cause of the issue. This frequently occurs when we push our bodies too hard, too quickly. For example, increasing your daily running distance by a few kilometers without giving your body the time to adjust to the new distance. Tight calf muscles and suddenly starting an aggressive exercise program can put extra stress on the Achilles tendon [4,5] Patients may walk with a limp or have may have difficulty taking a full stride. In long-standing cases, a single leg heel rise seen along with a limp while walking [6, 7]

There are two bursae in the back of the heel: The retrocalcaneal (subtendinous) bursa, situated between the Achilles tendon and the calcaneus, is anterior or deep to the tendon. The purpose of the fluid-filled region called the retrocalcaneal bursa, which is situated between the posterior side of the calcaneum and the

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antero inferior wall of the Achilles tendon, is to lessen friction caused by the movement of the tendon in the surrounding tissues [8, 9]. Numerous individuals dealing with this issue are middle-aged, and a small number may be overweight. Young, competitive runners are another subset of patients with this illness. When the heel is palpated in relation to the other side, there is swelling and discomfort. There is sometimes redness. Patients may have trouble taking a complete stride or walk with a limp. Long-term instances may exhibit a limping gait and a single leg heel raise [10]

The purpose of this research is to examine the modifiable risk factors connected with heel pain as well as to recognize and identify the common risk factors linked to heel pain. Our goals were to distinguish heel pain-related modifying from non-modifying factors and to improve patient care by implementing small, progressive lifestyle adjustments.

#### MATERIALS AND METHODS

This observational study is an analysis of all the common risk factors associated with heel pain to differentiate the modifying from the non- modifying factors that are associated with heel pain and to establish better patient care through gradual lifestyle changes

**SAMPLE SIZE:** A minimum of 200 patients will be included for the study.

**STUDY PERIOD:** Between June 2021 to July 2022.

### **PARTICIPANTS:**

Inclusion criteria:

- Age between 18-60 years
- Patient willing to participate in this study

Exclusion criteria:

- Fractures of foot
- Previous history of trauma
- Previous local steroid injection treatment
- Patient not consenting for the study

ALLOCATION & IMPLEMENTATION: Patients meeting the requirement of inclusion and exclusion

criteria were enrolled in this study on outpatient basis after obtaining valid consent. Necessary clinical and radiological evaluation was done.

**INTERVENTIONS:** The diagnosis was established by clinical, radiological examination and Biochemical examination (Antero-posterior and lateral view of ankle joint of the involved limb serum Thyroid Stimulating Hormone (TSH), random blood sugar, Uric acid, creatinine, CT and MRI if needed were done.

#### **OBJECTIVES:**

- To identify and recognise the common risk factors associated with heel pain.
- To differentiate the modifying from the nonmodifying factors that are associated with heel pain.
- To establish better patient care through gradual lifestyle changes

**OUTCOMES:** The demographic date such as age, gender, side involvement and occupation of the patient were recorded. Body Mass Index (BMI) were measured and associated comorbidities were recorded.

### **RESULTS**

Total During this period of 14 months, we came across 200 cases of Heel pain.All patients were followed up as per pre-established protocol and none of them were lost on follow up. Out of 200 cases of heel pain 96 were Plantar Fasciitis, 41 were Retrocalcaneal Bursitis, 32 Achilles Tendinopathy, 8 were Calcaneal Heel Spur, 6 were Haglund's Disease,6 were Sever's Disease,6 were Tarsal Tunnel Syndrome and 5 were Heel pad Syndrome. 200 patients (age group 1055 yrs) were chosen for study. All of the patients were followed up at 2 weeks, 4 weeks and 6 weeks until patients symptoms subside and sustains lifestyle changes.

### SEX DISTRIBUTION

Out of 200 patients 119 were female and 81 were males. It is observed that 59.5% were females and 40.5% were males. (Table 1 & Figure 1)

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| TABLE 1: SEX DISTRIBUTION |                |
|---------------------------|----------------|
| GENDER                    | NO OF PATIENTS |
|                           |                |
| MALE                      | 81             |
|                           |                |
| FEMALE                    | 119            |
|                           |                |

#### FIGURE 1: SEX DISTRIBUTION



### AGE DISTRIBUTION

The youngest patient of the study was 10 years of age and oldest being 55 years old. The Mean age was 30.5 years. The maximum number of cases were observed between 31-40 years of age group.

| AGE IN YEARS | NO. OF PATIENTS |
|--------------|-----------------|
| 18-20        | 17              |
| 21-30        | 35              |
| 31-40        | 72              |
| 41-50        | 50              |
| 51-60        | 26              |

## **TABLE 2: AGE DISTRIBUTION**

### FIGURE 2: AGE DISTRIBUTION



Figure: Age wise Distribution.

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### SIDE DISTRIBUTION:

The Right-side heel pain found to be most commonly involved in this study followed by left-side involvement.

| SIDE      | SIDE INVOLVED |
|-----------|---------------|
| RIGHT     | 98            |
| LEFT      | 86            |
| BILATERAL | 16            |

#### TABLE 3: SIDE DISTRIBUTION

#### FIGURE 3: SIDE DISTRIBUTION



#### FIGURE: SIDE WISE DISTRIBUTION.

### **OCCUPATION DEMOGRAPHY:**

We found maximum number of patients belonging to farmer, daily wage workers and the housewives were TABLE 4: OCCUPATION DEMOGRAPHY second most commonly involved. The students and the skilled workers were the least commonly involved.

| OCCUPATION   | NUMBER OF PATIENTS |
|--------------|--------------------|
| HOUSEWIFE    | 46                 |
| SKILL WORKER | 4                  |
| PROFESSIONAL | 20                 |
| LABOURER     | 63                 |
| FARMER       | 63                 |
| STUDENT      | 4                  |

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### FIGURE 4: OCCUPATION DEMOGRAPHY



### **BMI DISTRIBUTION**

We found maximum number of patients belonging to 25.0-29.9 kg/m2 who belonged to overweight section

followed by patients belonging to 18.5-24.9 kg/m2 who belonged to normal-weight section.

### TABLE 5: BMI DISTRIBUTION

| BMI                          | NUMBER OF PATIENTS |
|------------------------------|--------------------|
| BELOW 18.5 (UNDERWEIGHT)     | 18                 |
| 18.5-24.9 (NORMAL WEIGHT)    | 40                 |
| 25.0-29.9 (OVERWEIGHT)       | 69                 |
| 30.0-34.9 (OBESITY CLASS I)  | 37                 |
| 35.0-39.9 (OBESITY CLASS II) | 21                 |
| ABOVE 40 (OBESITY CLASS III) | 15                 |

### FIGURE 6: BMI DISTRIBUTION



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### **COMORBIDITY DISTRIBUTION:**

We found that the maximum number of patients were suffering from hypothyroidism followed by diabetic mellitus and hypertension.

| COMORBIDITIES     | NUMBER OF PATIENTS |
|-------------------|--------------------|
| HYPOTHYROIDISM    | 63                 |
| HYPERTHYROIDISM   | 8                  |
| DIABETES MELLITUS | 44                 |
| HYPERURICEMIA     | 24                 |
| HYPERTENSION      | 36                 |
| NO COMORBIDITIES  | 25                 |

### TABLE 6: COMORBIDITY DISTRIBUTION

#### FIGURE 6: COMORBIDITY DISTRIBUTION



#### Discussion

Ankle discomfort include both posterior heel pain and plantar side calcaneus pain. Anecdotally, it was discovered in the current clinical work that individuals with posterior heel pain frequently presented with plantar heel discomfort. Calcaneal spurs are outgrowths of bone into tendon and ligamentous attachments. They primarily occur at two locations: one on the inferior aspect of the calcaneus, which coincides with the insertion of the posterior fibers of the long plantar ligament, and the other at the posterior aspect of the calcaneus, close to the insertion of the Achilles tendon [11, 12] The symptoms of retrocalcaneal bursitis include tender swelling across the calcaneum's posterior surface. Achilles tendinitis has also reported to cause similar soreness. Along with extreme discomfort during walking, some patients also report tingling and numbness in the plantar area of their feet. In over 90% of instances, conservative therapy is effective in managing proximal plantar fasciitis [13]. Generally

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speaking, it takes longer for a patient to experience total pain relief the longer their symptoms have persisted.

After reviewing biochemical tests and imaging investigations, we discovered that, of the 200 patients, 119 were female and 81 were male. 40.5% of the population was reported to be male, and 59.5% to be female. The study's youngest patient was ten years old, and its oldest patient was fifty-five. 30.5 years was the mean age. The age group of 31 to 40 years old saw the highest number of instances. The Right-side heel pain found to be most commonly involved in this study. We found maximum number of patients belonging to farmer, daily wage workers (labourers). We found maximum number of patients belonging to 25.0-29.9 kg/m2. We found maximum number of patients affected were suffering from Hypothyroidism. First, through weight-bearing lateral ankle X-rays, a relationship between posterior calcaneus spurs and plantar calcaneus spurs in insertional Achilles tendinitis patients was found, and a biomechanical complex involving the Achilles tendon, calcaneus, and plantar fascia was deduced. It was suggested that insertional Achilles tendonitis and plantar fasciitis should be considered to be related and treated synthetically in clinical practice [14, 15]

Not a single one of the 200 patients was lost to followup. Every patient was checked on every two, four, and six weeks until their problems subsided and they maintained their new lifestyle. Usually observed in unilateral feet, more common in females than in males, and typically observed in the age range of 31 to 40 years on average [16, 17]. Often observed in hardworking workers, such as laborers or farmers. Heel pain is also frequently caused by a higher BMI [18]. We discovered that the greatest proportion of people afflicted with hypothyroidism, which was more common than hyperthyroidism, hypertension, and diabetes mellitus. All studies have limitations, and ours was no different. Our research was restricted to evaluating the level of pain alone. It was not possible to generalize this study to everyone, as the sample size was small.

#### **CONCLUSION:**

Our research revealed that heel pain was more common in women than in men, and that it typically affected the right foot more than the left when it came to unilateral foot pain. The average age group that is most frequently affected is 31–40 years old, followed by 41–50 years old. Heel pain was most frequently reported in hardworking people like farmers and laborers, then housewives, and least frequently in skilled workers and students. Heel pain is also frequently caused by a higher BMI. We discovered that the greatest number of individuals afflicted had hypothyroidism, which was more common than diabetes mellitus, hypertension, and hyperthyroidism, respectively.

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