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Incidence of plantar fasciitis in overweight patients of government hospitals of Faisalabad city.

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ABSTRACT… Objective: To determine relationships of body mass index with plantar fasciitis and foot functions index and how many activities of daily living were limited with plantar heel pain due to overweight in population of Government Hospitals of Faisalabad City. **Study Design:** Cross-sectional study. **Setting:** Government Hospitals of Faisalabad City (Allied Hospital & District Headquarter Hospital). **Period:** March to May 2018. **Material & Methods:** 140 patients included both males and females. Convenient sampling technique was used in selection of study sample. Calculate BMI (kg/m^2) and FFI questionnaire used in this study to find how many activities of daily living was limited with plantar heel pain due to overweight. Data was analyzed by using statistical package for social sciences (SPSS) version 20. Chi square test was applied. **Results:** There were 70 males and 70 females. Data was collected to overweight population (mean age, 42.15; mean BMI, 29.52 kg/m^2; and mean height, 1.68m). Out of 140 overweight population was (66.4%) and obese population (33.6%). The windlass test showed (87.9%) positive and (12.1%) negative. Chi-square test revealed no significant relation between rise in BMI and plantar heel pain ($p = 0.105$). However it shows significant relation between rise in BMI and FFI ($p = 0.000$). **Conclusion:** There is no statistical significant relation between body mass index and plantar fasciitis. According to foot function index patients significantly limit activities of daily living with plantar heel pain due to overweight.

Key words: Body Mass Index, Foot Function Index, Overweight, Plantar Fasciitis.

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INTRODUCTION

10% population was affected every year with plantar pain. Mainly people of 18 to 65 year of age were effect with plantar heel pain.[1] Plantar fasciitis has depressed particularly below the foot and general physical condition associated with quality of life. Plantar fasciitis shows bad impact in various aspects of an individual's daily living activities, ankle and foot related quality of life and also in sports and recreational activities.[2] The possible developing risk factors for plantar fasciitis comprise older age (40 to 60), particularly in females.[3,4] In general public old human being reported the pain of foot which was related to the decline in performance of the daily living activities, difficulties with the walking and the balancing of body (gait) during walk also increase in the risks of the falls.[5] (Frey and Zamora, 2007) believed that obese persons may have a greater number of foot and ankle issues. They compared rate of orthopedic foot and ankle problems with the BMI. Overweight and obese persons may undergo such problems like plantar fasciitis, arthritis and problem with shoe fit. The conclusion of the problem like tendinitis, plantar fasciitis, and osteoarthritis was frequently secondary to overuse and with increase weight on the soft tissues and joints.[6] Gohiya et al. researched that night splint provide passive stretching which prevent foot from micro trauma. Use of night splints was very difficult but the result showed 95% compliance. It was more effective in patients of chronic plantar fasciitis.[7] Conservative management of plantar heel pain doing self-stretching exercises, avoid bare foot walking, use soft heel pad/foot ware, reduces weight and limit heavy work activities was used to manage plantar heel pain.[8] According to D'souza et al., 2005 rise in BMI, too long

standing and aggressive work could be cause of plantar fasciitis and other musculoskeletal related symptoms.[9] In 2008 Hill et al., suggested that the pain in foot was very high in old peoples as compared to young adults and it effects almost older adult more than 65 years of age.[5] Cryotherapy ultrasound was good treatment for long-lasting improvement in patients of chronic plantar fasciitis.[10] World Health Organization (WHO) suggests a typical categorization of fully developed persons overweight and obesity follow by means of body mass index (BMI) estimation. In BMI overweight was specify in range of (25 to 29.9 kg/m^2) and obesity in range of (30 kg/m^2 or more than 30).[6,11] (Reb et al., 2015) reviewed the patients suffering from inflammation of the tendon of tibials posterior, plantar fasciitis. The ratio of tibials anterior tendinitis was 1 in 11 patients of plantar fasciitis. The comparison was performed between patient's age, gender and their index of body mass. By comparing them they found out that there were no statistical difference in the patients with difference diagnosis but females were effect in large numbers. The conclusion of collected data supported the connectivity between the foot pathologies and the obesity.[12] A study showed that rise in BMI, too long standing, and aggressive work could be cause of plantar fasciitis and other musculoskeletal related symptoms. The possibility feature like age and weight of the person, BMI or other type of medical histories compared to the history of work like too much standing or walking, standing at hard surface or doing heavy works is reasons for plantar heel pain.[9] Increased BMI is highly related with foot pain and disability. Rise in BMI and foot pain was also due to increase in biomechanical and metabolic mechanisms.[13] (Radford et al., 2007) did research for the short term treatment of heel pain by the stretching of calf muscles. They concluded that stretching of two weeks for the short term treatment of heel pain provides no significant improvement statistically in the foot pain or function as compared to the not stretching.[14,15]

Plantar fasciitis is a common musculoskeletal disorder causing foot pain. Some patients with this symptom can have significant functional limitations and prolonged disability. The purpose of this study is to find possibility of plantar fasciitis in overweight patients of Government Hospitals of Faisalabad city and how many activities of daily livings are effects with plantar fasciitis and overweight.

MATERIAL & METHODS

Cross sectional study used FFI questionnaire. Study was carried out from 22nd march to 15th may 2018 in Allied and District Headquarters Hospital Faisalabad. Approval for this study was taken from hospital authorities. Sample size measured by margins of error = 5%, confidence level = 95% and population was expected 10%. Calculated sample size was 138 and taken sample size was 140.

$$n = \left(\frac{Z\alpha_{/2}\sqrt{pq}}{E} \right)^2$$

Where, n = sample size, E = margin of error, p = population size, q = (1-p) □□2 = critical value for confidence level for 95% its value was (1.96).[16] One hundred and forty (140) patients of either gender, aged 20-60 year include who was overweight and patients had pain during prolonged standing. Patients were excluded who have previous treatment or surgery for plantar fasciitis, history of ankle and foot injury, congenital deformity of foot or ankle and use of a supportive device for ambulation. Privacy of patients was engaged and reserved in view of all ethical consideration (TUF/Dean/2018/005) by trust the patients that data must be kept confidential. No one was forced to take part as participant in this study. Windlass test was performed to evaluate plantar fasciitis.[17] In FFI questionnaire had 17 questions (Total score of FFI was 170). In FFI questionnaire visual analog scale used for the statistical purpose and scale was divided into four types (no pain, mild, moderate and severe.[18] Data was analyzed by using statistical package for social sciences (SPSS) version 20.

RESULTS

140 patient's data was collected.[16] Data was collected to overweight population (mean age, 42.15; mean BMI, 29.52 kg/m^2; and mean height,

1.68m). The variables frequency distributions are show in Table-I.

Relationship between BMI and Plantar Heel Pain

It shows the comparison between BMI and plantar heel pain in overweight and obese population. It states that overweight population of 94.6% was suffering from plantar heel pain while 5.4% was not suffering from plantar heel pain. On the other hand 100% of obese population was suffering from plantar heel pain. Chi-square value 2.620[a] and p-value = .105 shows that there is no statistically significant association found between BMI and plantar heel pain. The relationship between BMI and plantar heel pain has shown in Table-II.

Relationship between BMI and FFI

It shows total relationship between body mass index and foot function index. FFI percentage range (26-50%) shows that (65.6%) population is overweight and (25.5%) obese. FFI percentage range (51-75%) shows that (34.4%) patient is overweight and (74.5%) obese. Result show significant relationship between BMI and FFI. Chi-square value is 20.078[a] and p-value = .000. The relationship between BMI and FFI has shown in Table-III.

Relationship between Plantar Fasciitis and FFI

Table-IV shows that relationship between plantar fasciitis and foot function index. FFI percentage range (26-50%) shows that (50.4%) and range (51-75%) shows that (49.6%) population has plantar fasciitis. Result shows no significant relationship between plantar fasciitis and FFI. Chi-square value is 4.759[a] and p-value = .029.

Variables	Options	Frequency
Age	20-30 31-40 41-50 51-60	11 (7.9%) 44 (31.4%) 62 (44.3%) 23 (16.4%)
Gender	Male Female	70 (50%) 70 (50%)
BMI	Overweight (25-29.9) Obese (30+)	93 (66.4%) 47 (33.6%)
Windlass Test	Positive Negative	123 (87.9%) 17 (12.1%)
Plantar Fasciitis Pain	Yes No	135 (96.4%) 5 (3.6%)
Site of Pain	Right Left Both	40 (28.6%) 39 (27.9%) 61 (43.6%)
In the morning upon taking your first step?	Mild Moderate Severe	6 (4.3%) 105 (75%) 29 (20.7%)
When walking?	Mild Moderate Severe	19 (13.6%) 102 (72.9%) 19 (13.6)
When standing?	Mild Moderate Severe	24 (17.1%) 95 (67.9%) 21 (15%)
How is your pain at the end of the day?	Mild Moderate Severe	3 (2.1%) 66 (47.1%) 71 (50.7%)

Table-I. Variables frequency distributions.

How severe is your pain at its worst?	Mild Moderate Severe	0 (0%) 45 (32.1%) 95 (67.9%)
When walking in the house?	Mild Moderate Severe	11 (7.9%) 123 (87.9%) 6 (4.3%)
When walking outside?	Mild Moderate Severe	5 (3.6%) 96 (68.6%) 39 (27.9%)
When walking four blocks?	Mild Moderate Severe	38 (27.1%) 74 (52.9%) 28 (20%)
When climbing stairs?	Mild Moderate Severe	4 (2.9%) 92 (65.7%) 44 (31.4%)
When descending stairs?	No Pain Mild Moderate Severe	1 (0.7%) 13 (9.3%) 93 (66.4%) 33 (23.6%)
When standing tip toe?	Mild Moderate Severe	2 (1.4%) 63 (45%) 75 (53.6%)
When getting up from a chair?	Mild Moderate Severe	33 (23.6%) 86 (61.4%) 21 (15%)
When climbing curbs?	Moderate Severe	81 (57.9%) 59 (42.1%)
When running or fast walking?	Mild Moderate Severe	7 (5%) 77 (55%) 56 (40%)
Use an assistive device (cane, walker, crutches, etc) indoors?	No Pain Mild Moderate	24 (17.1%) 94 (67.1%) 22 (15.7%)
Use an assistive device (cane, walker, crutches, etc) outdoors?	No Pain Mild Moderate Severe	28 (20%) 65 (46.4%) 44 (31.4%) 3 (2.1%)
Limit physical activities?	No Pain Mild Moderate	4 (2.9%) 88 (62.9%) 48 (34.3%)
Overall FFI %	26-50% 51-70%	73 (52.1%) 67 (47.9%)

		Plantar Heel Pain		Total
		Yes	No	
BMI	Overweight	88	5	93
	Obese	47	0	47
Total		135	5	140

Table-II. BMI Plantar heel pain cross tabulation.

		FFI Percentage		Total
		26-50%	51-75%	
BMI	Overweight	61	32	93
	Obese	12	35	47
Total		73	67	140

Table-III. BMI FFI percentage cross tabulation.

		FFI Percentage		Total
		26-50%	51-75%	
Plantar Fasciitis	Yes	68	67	135
	No	5	0	5
Total		73	67	140

Table-IV. Plantar fasciitis FFI percentage cross tabulation.

DISCUSSION

The results of our research show that majority of patients was overweight (66.4%), obese (33.6%) and maximum numbers of patients had plantar heel pain (96.4%). The results of windlass test (87.9%) had positive. FFI questionnaire shows (52.1%) moderate, and (47.9%) severe pain its shows that there is a need to work for improve quality of life by conservative treatment of choice rather than use of steroid injection/ non conservative treatment. Someone also suggested that rise in BMI was strongly related with chronic plantar heel pain in a non-athletic population and non-specific foot pain in the general population. In view of that the incidence of obesity is increasing worldwide, the prevalence of musculoskeletal foot disorders is also increase.[19,20]

(Butterworth et al., 2012) also suggested that rise in BMI was strongly related with chronic plantar heel pain in a non-athletic population and non-specific foot pain in the general population. In view of that the incidence of obesity is increasing worldwide, the prevalence of musculoskeletal foot disorders is also increase.[21] This study was helped to find the prevalence of overweight patients who are suffering from plantar fasciitis in Government Hospitals of Faisalabad city. Also to help the mankind in solving problems related to foot functions which are faced from time to time and to make life more comfortable and entertaining. It also gives the evidence of how many activities of daily living related to foot function are limited by rise in BMI. Authors (Mickle and Steele, 2015) concluded whether the structural and functional changes to the foot were acute or developed over an extended period of time. Also don't know that foot pain and related problems were reducing or limiting mobility and physical activity to the point where people was becoming overweight and obese.[22] Many previous studies was show that plantar heel pain show bad impact in various aspects of an individual's life daily living activities, foot and ankle related quality of life and function in sport and recreation activities. According to[3,9] established numerous of the known risk factors related with the development of plantar fasciitis and was able to quantify the relationship based on quantitative job exposure of walking and standing activities on hard surfaces. They did not get a significant relationship between plantar fasciitis and obesity. But they confirmed the relationship between plantar fasciitis and faulty foot mechanics.

In our research there was no statistically significant association between plantar heel pain and overweight, but our research show statistically significant association between foot function index and overweight. Foot function index also significant associate with age, which showed that by increasing age foot function index was effect and limit the activities of daily livings.

The study was limited in term of its respondents only 140 respondents could be arranged for responses. Small sample size makes it difficult to generalize the findings to population at large. Time was a big constraint so more time could not be devoted to individuals respondents. The busy schedule of respondents also makes the collection of information a difficult one. While conducting this research we feel the deep relationship between those patients having plantar heel pain, many activities of daily livings were limited and difficulty to maintain quality of life due to rise in body mass index. So we have real time information about how patients were felling.

CONCLUSION

This study was conducted in Government Hospitals of Faisalabad city to see plantar heel pain and how many activities of daily living were affected with plantar heel pain due to overweight. We concluded that no statistically significant relation between body mass index and plantar fasciitis, but foot function index patients statistically significantly limit activities of daily

living with plantar heel pain due to overweight.
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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Shahroz Saleem	Review of literature, Methodology & Data collection.	
3	Hafiz Salman Saeed	Conceptulization & Supervision.	
4	Ahmad Bilal	Data analysis & Drafting.	
5	Zafar Ali Zafar	Discussion.	
6	Zeeshan Ali	Proof reading.	