SHORT COMMUNIATION
A SURVEY ON MUSCULOSKELETAL PROBLEMS IN WOMEN WEARING HIGH HEEL SHOES

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ABSTRACT

Background: Wearing high heel is especially stressful for the joint of foot because all the body weight rests here; foot is then forced into narrow pointed toe box compounding the associated musculoskeletal problems. Therefore a survey was carried out to see the musculoskeletal problems in women wearing high heel shoes.

Methodology: A survey was carried out in Morres College, Anjuman College of engineering; kingfisher & Franklin airlines.Total 40 subjects read and signed an institutionally approved informed consent form. Questionnaires were provided to the subjects and the responses were documented on data collection form.

Result: In our study we found that (75%) women were symptomatic for musculoskeletal problem who wore high heel shoes.

Conclusion:Concluded thatmusculoskeletal problemswere in descending order in plantar fasciitis , Tendoachilles tightness, lowbackpain and then in metatarsalgia , Morton's neuroma, hallux valgus, corn, callus, bunion.

KEYWORDS: Tendoachilles Tightness; Lowbackpain; M; Morton's Neuroma; Hallux Valgus; Metatarsalgia; Hammer toe; Corn; Calluses; Bunion

INTRODUCTION

A women wearing high heel looks more elegant, graceful and stylish and looks aesthetical taller, slender. Professional women working in the office prefer to wear high heel shoes.

Types of shoes worn are 1. Still toe 2.Platform

High heel more than 6" raises the wear's feet significantly higher than toes.High heel forces your body weight to be thrown forward and make your legs, feet, hip and spine work against the way they were designed to work[1-3].

Wearing high heel is especially stressful for the joint of foot because all the body weight rests here, foot is then forced into narrow pointed toe box compounding the problems, the common musculoskeletal problem associated with high heels are[1-5]:

Low Back Pain (LBP): Since high heel causes the body lean forward it is compensated by tilting pelvis forward and changing spine curvature by increasing lordosis .This all creates more stress for the nerves of lumbar spine and tightenyour low back causing back pain .

Anterior knee pain: It also increases the prevalence of anterior knee pain by stressing the quadriceps muscle and is one of the risk factor for Osteoarthritis (OA) in old age.

Tendoachilles Tightness (TA): A constant plantar flexion in high heel shoes, stress the TA, causing its tightness. The tightness is about 15 degrees is significant.

Foot: A) Plantar Fasciitis (PF): Refers to syndrome of inflammation of band of tissue that runs from the heel along the arch of foot because of wearing high heel the plantar fascia is tensed and micro trauma produced causes its inflammation resulting in PF.

B) Metatarsalgia: In this pain with burning sensation occurs over the plantar aspect of foot when the excessive proportion of body weight is taken up by the forefoot.By wearing high heels pain is felt under metatarsal head.

C) Morton's Neuroma: Due to constant use of high heels with compact toe box there is compression and thickening of nerve tissues that develop 3rd, 4th toe.

D) Callus: It is especially toughened area of skin which has become relatively thick and hard in response to repeated friction pressure and other irritation by wearing high heel shoes.

E) Bunion: It is localized painful swelling at the base of big toe that can accompany hallux valgus. It is frequently associated with inflammation of nearby bursa caused due to wearing tight fitting high heel shoes. Because of frequent usage of light shoes, toes tend to take shape of shoe big toe overlap smaller toe causing enlargement and swelling.

G) Hammer toe: Common deformity of foot in which either 2nd, 3rd , 4th toe is bend at middle IP joint so that tip of toe is bend downward while middle of the toe is bend upward resembling a hammer.

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METHODOLOGY

Approval for the study was taken from the Institutional Ethics Committee.

A cross-sectional study was carried out in Morres College, Anjuman College of engineering, kingfisher & Frankfinn airlines.

INCLUSION CRITERIA

- Age Group 18-25 Years
- Height Of Heel >5cm
- Duration Of Wearing Of High Heel Shoes > 3 Hrs / Day
- Frequency Of Wearing High Heel Shoes > 4 Times / Week

EXCLUSSION CRITERIA

- Previous history of injury in ankle,kneeback < 1 month.Those found eligible for study were explained the study in detail in the language best understood by the subject

By Purposive sampling total 40 participants were recruited who read and signed an institutionally approved informed consent form. Questionnaires were provided to the subjects and the responses were documented on data collection form.

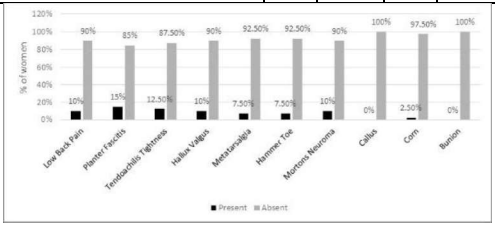
STATISTICAL ANALYSIS

Statistical analysis was done by using descriptive and inferential statistics using Chi-square test and software used in the analysis were SPSS 17.0 version,GraphPad Prism 6.0 and EPI-INFO 6.0 version and $p<0.05$ is considered as level of significance.

RESULTS

TABLE 1: Distribution of women according to symptoms

Symptoms	Present		Absent	
	No	%	No	%
Low Back Pain	4	10	36	90
Planter Fascitis	6	15	34	85
Tendoachilles Tightness	5	12.5	35	87.5
Hallux Valgus	4	10	36	90
Metatarsalgia	3	7.5	37	92.5
Hammer Toe	3	7.5	37	92.5
Morton's Neuroma	4	10	36	90
Callus	0	0	40	100
Corn	1	2.5	39	97.5
Bunion	0	0	40	100

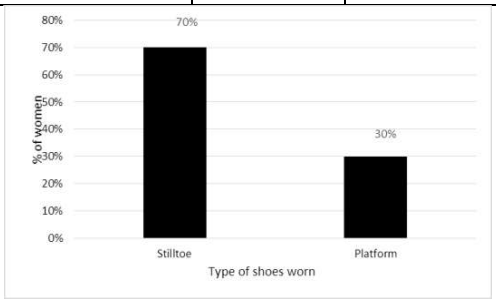


GRAPH 1: Distribution of women according to symptoms

Low back pain, hallux valgus and Morton's neuroma was present in 10% of women, planter fasciitis in 15%, tendoachilles tightness in 12.5%, metatarsalgia and hammer toe in each 7.5% of women and corn in 2.5% of women respectively.

TABLE 2: Distribution of women according to type of shoes worn

Type of shoes worn	No of women	Percentage (%)
Stilltoe	28	70
Platform	12	30
Total	40	100

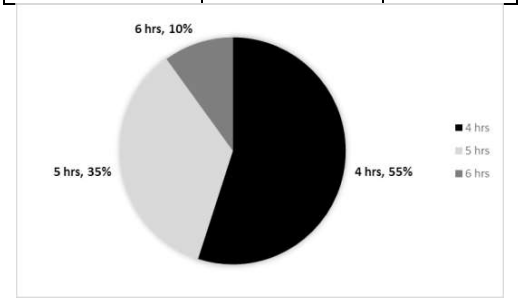


GRAPH 2: Distribution of women according to type of shoes worn

28(70%) of women worn still toe type of shoes and 12(30%) women worn platform type of shoes respectively.

TABLE 3: Duration of wearing high heel shoes and performing the activity standing walking

Duration of wearing high heel shoes	No of women	Percentage (%)
4 Hrs	22	55
5Hrs	14	35
6Hrs	4	10
Total	40	100

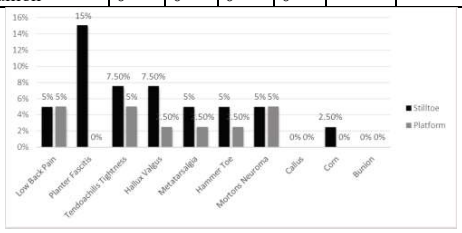


GRAPH 3: Duration of wearing high heel shoes and performing the activity standing walking

Duration of wearing high heel shoes was 4 hrs in 55% of women, 5 hrs in 35% of women and 6hrs in 10% of women respectively.

TABLE 4: Relationship between musculoskeletal problems and type of shoes worn

Symptoms	Stilltoe		Platform		χ2 value	p-value
	NO	%	NO	%		
Low Back Pain	2	5	2	5	0.84	0.35,NS
Plantar fasciitis	6	15	00		3.02	0.08,NS
Tendoachilles Tightness	3	7.5	2	5	0.27	0.60,NS
Hallux Valgus	3	7.5	1	2.5	0.05	0.81,NS
Metatarsalgia	2	5	1	2.5	0.01	0.89,NS
Hammer Toe	2	5	1	2.5	0.01	0.89,NS
Morton's Neuroma	2	5	2	5	0.84	0.35,NS
Callus	0	0	0	0	-	-
Corn	1	2.5	0	0	0.44	0.50, NS
Bunion	0	0	0	0	--	

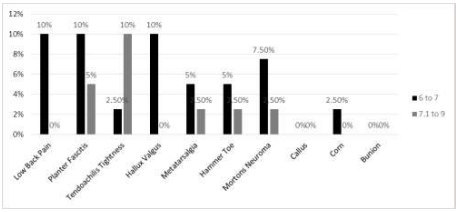


GRAPH 4: Relationship between musculoskeletal problems and type of shoes worn

Low back pain was present in 5% stilltoe and platform type of shoes worn(χ2-value=0.84,p-value=0.35), planter fasciitis was present in 15% of stilltoe(χ2-value=3.02,p-value=0.08), tendoachilles tightness in 7.5% of stilltoe and 5% of platform(χ2-value=0.27,p-value=0.60), hallux valgus in 7.5% of stilltoe and 2.5% of platform χ2-value=0.05,p-value=0.81), metatarsalgia in 5% of stilltoe and 2.5% of platform(χ2-value=0.01,p-value=0.89), hammer toe in 5% of stilltoe and 2.5% of platform(χ2-value=0.01,p-value=0.89), Morton's neuroma in each 5% of stilltoe and platform(χ2-value=0.84,p-value=0.35) and corn was present in 2.5% of stilltoe type of shoes worn(χ2-value=0.44,p-value=0.50).

TABLE 5: Relationship between musculoskeletal problems and heel height

Symptoms	6 to 7		7.1 to 9		χ2-value	p-value
	No	%	No	%		
Low Back Pain	4	10	0	0	2.14	0.14,NS
Plantar Fascitis	4	10	2	5	0.002	0.96,NS
Tendoachilles Tightness	1	2.5	4	10	5.87	0.015,S
Hallux Valgus	4	10	0	0	2.14	0.14,NS
Metatarsalgia	2	5	1	2.5	0.001	0.97,NS
Hammer Toe	2	5	1	2.5	0.001	0.97,NS
Morton'sNeuroma	3	7.5	1	2.5	0.11	0.73,NS
Callus	0	0	0	0	-	-
Corn	1	2.5	0	0	0.49	0.48,NS
Bunion	0	0	0	0	-	-



GRAPH 5: Relationship between musculoskeletal problems and heel height

Low back pain was present in 5% of women wearingshoes ofheel height 6-7 (χ2-value=0.2.14,p-value=0.14), planter fasciitis was present in 10%women wearing shoes of heel height 6-7 and 5% of 7.1 to 9 (χ2-value=0.002,p-value=0.96), tendoachilles tightness in 2.5%womenwearing of 6-7 and 10% of 7.1 to 9(χ2-value=5.87,p-value=0.015), hallux valgus in 10%women of 6-7(χ2-value=2.14,p-value=0.14), metatarsalgia in 5% women wearing shoesof 6-7 and 2.5% of 7.1-9(χ2-value=0.001,p-value=0.97), hammer toe in 5%women wearingshoes of 6-7 and 2.5% of 7.1-9 height (χ2-value=0.001,p-value=0.97), Morton's neuroma in each 7.5% of 6-7 and 2.5% of 7.1-9 (χ2-value=0.11,p-value=0.73) and corn was present in 2.5% of 6-7 heel height (χ2-value=0.49,p-value=0.48).

Plantar fasciitis is inflammation of band of tissue that runs from the heel along the arch of foot. Wearing high heel shoes and performing activities like walking, stair climbing and performed standing produces stress and micro trauma on plantar fascia resulting its inflammation and pain, also wearing high heels causes excessive pronation of foot and produces stress on medial arch further tensing the plantar fascia.

CONCLUSION

In our study we found that plantar fasciitis was most common musculoskeletal problem in women wearing high heel shoes. Musculoskeletal problems were in descending order in plantar fasciitis, Tendoachilles tightness, lowbackpain, Morton's neuroma, hallux valgus, Metatarsalgia, corn, callus, and bunion.

CLINICAL IMPLICATION

Since wearing high heel shoes leads to musculoskeletal problems which ispotentially modifiable / preventable by changing footwear.

Further study can be done with large sample size, considering problems in detail.

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CONFLICT OF INTEREST

Nil

REFERENCES

1. Cryolyn Kisner and Lynn Colby. Therapeutic exercise foundations & technique. 5th edition2007
2. Jayant Joshi, Prakash Kotwal. Essentials of orthopedics and applied physiotherapy. 3rd edition 2009
3. Pamela K.Levangie, Cynthia C.Norkin. Joint structure and function: A Comprehensive Analysis. 4th edition 2006
4. Franklin ME, Chenier TC, Brauninger L, Cook H, Harris S. Effect of positive heel inclination on posture. Journal of Orthopaedic & Sports Physical Therapy. 1995 Feb;21(2):94-9.
5. Opila-Correia KA. Kinematics of high-heeled gait. Archives of physical medicine and rehabilitation. 1990 Apr;71(5):304-9.