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Research article

Prevalence of Hallux Valgus in Normal Individuals

Krishna B. Gawande[1], Sanket Mungikar[1], Rinkle Hotwani[1*], Sneha Ingle[2], Chaitanya A. Kulkarni[2]

1. MGM School of Physiotherapy Aurangabad, MGMIHS, Navi Mumbai, Maharashtra, India.
2. Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.

ABSTRACT

To find out the prevalence of hallux valgus in normal individuals. The lateral deviation of the big toe at the first metatarsophalangeal joint is also known as Hallux valgus and is frequently common in women's. The primary function of the foot is to control the body weight and to serve as a part of lever for its proper functioning. Basically body weight and the strain falls along with the center of the foot and maintain the balance there by surrounding muscular activity. By any chance if this normal synchronization is disturbed in the performance of their function, in spite of accommodative power of nature to disease and deformity. Cross sectional study 200 male and female with or without foot pain were included. 38.59% and 31.46% of male and female have hallux valgus of right foot out of total samples. 45.61% and 39.15% of male and female have hallux valgus of left foot out of total samples. The result of the study concluded that the prevalence of hallux valgus deformity was greater in older aged group than young aged group and among which showed left foot was more commonly affected in both males and females. It also showed that it does not affect functional activity in normal young individual.

Keywords: Metatarsophalangeal joint, Body mass index, Hallux valgus

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Correspondence: Chaitanya A. Kulkarni* ✉ chaitanya.k@dmimsu.edu.in

Resident, Department of Community Health Physiotherapy, Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.

INTRODUCTION

The function of foot is to bear the weight of the body and to serve as a lever for its work [1]. Normally this weight and strain fall through the Centre of foot and balanced there by muscular activity. If for any cause this normal relationship is disturbed, the foot is there by placed at mechanical disadvantage in the performance of its functions, in spite of accommodative power of nature to disease and deformity, its mechanisms are subject to the same law that govern other machines, a fact that must be appreciated in weakness is to be recognized and deformity [2].

Hallux valgus (HV) is a deformity characterized by lateral deviation of the big toe at the first metatarsophalangeal (MTP) joint and is more frequent among women [3]. In the hallux valgus the first MTP joint protrudes due to big toe deformity and inflammation, swelling may be induced by internal and external stimulation. Hallux valgus was reported to be associated with gender, age, foot wear and Body mass index (BMI) [4,5].

Causes of hallux valgus includes intrinsic factors such as family history, foot structure (pesplanus, pronation of hind foot, muscle imbalance in abductors and adductors muscle contracture of Achilles tendon, connective tissue and a generalized joint laxity, neuromuscular disease (stroke or cerebral palsy) arthritis, female gender, extrinsic factors such as footwear (high heels or narrow toe boxes), trauma[6]. The recent increase in hallux valgus prevalence is thought to be largely due to effect of footwear including high heeled shoes, particularly in a middle aged and older people [7].

HV is a commonly associated with deviated position of big toe towards second toe and deviation in the angle between first and second metatarsal bone on foot the small sesamoid bone found beneath first metatarsal (which help the flexor tendon to bend the big toe downwards) may also become deviated overtime as first metatarsal bone, drifts away from its normal position, arthritis of big toe joint, diminished and or altered range of motion and discomfort with pressure

applied to the bump or with motion of the joint, may all accompany bunion development[8]. A top of the first metatarsal head either medially or dorsomedially, there can also arise a bursa that when inflamed (bursitis) can be most painful aspect of process[9].

HV can be treated conservatively by intrinsic interventions i.e. manual therapy and exercises such as strengthening exercises of abductors and adductors, also can be treated by changes in shoes, different orthotics (accommodative padding and shielding) rest, ice and medication. Severe deformity can be treated by surgery (orthopaedic surgeon)[10,11].

MATERIALS AND METHODS

Screening of 200 normal individuals including both male and female of age group between 20 to 50 years were done in MGM College of Physiotherapy, Aurangabad, India. The subjects who participated in the study according to inclusion criteria was selected as a sample of the study by convenient sampling method. Exclusion criteria were any other foot deformity and post-surgical individual. The study was conducted with 200 samples by cross sectional study design. Further the assessment of hallux valgus was carried out with the help of footprint measurement and plastic goniometer. A platform was made and ink was spread over a punch box, the individual remains in standing position and with the help of therapist the individual were made to place a feet on the punch box, with contralateral foot out of the platform. Then individual were requested to place that feet on the blank paper which showed clear footprint and a standardized assessment was conducted by marking dorsal protrusion of first metatarsal.

The foot examination was done and with the help of footprint the angle of hallux valgus was measured between the line joining the mark of centre of head and centre of base of metatarsal shaft and the connecting the centre of metatarsal head and hallux. The angle of HV was measured by drawing two lines, one by joining the medial points on the great toe to the most medial point corresponding with the head of the first metatarsal.

Figure 1. Platform for foot examination

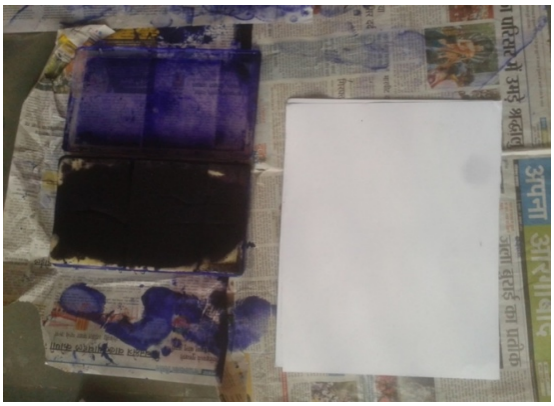


Figure 2. Measurement of HV

Data analysis

Demographic data was done to find out the prevalence of hallux valgus and also to find gender distribution between age group and severity.

RESULTS

Table 1. Distribution of individuals according to gender and severity in right foot

Gender	No deformity	Mild deformity	Moderate deformity	Severe deformity
MALE	35	15	7	0
FEMALE	98	36	9	0
TOTAL	133	51	16	0

Figure 3. Distribution according to no, mild, moderate and severe deformity

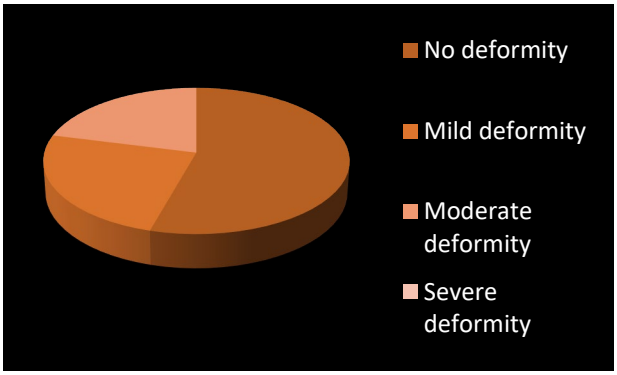


Table 2: Distribution of individuals according to gender and severity in left foot.

Gender	No deformity	Mild deformity	Moderate deformity	Severe deformity
Male	31	14	12	0
Female	87	41	15	0
Total	118	55	27	0

Table 3: Distribution of individuals according to age males and females in right foot

AGE	Mild	Moderate	Severe
20-30 years	34	10	0
31-40 years	9	3	0
41-50 years	8	3	0

Figure 4. Distribution according to no, mild, moderate and severe deformity

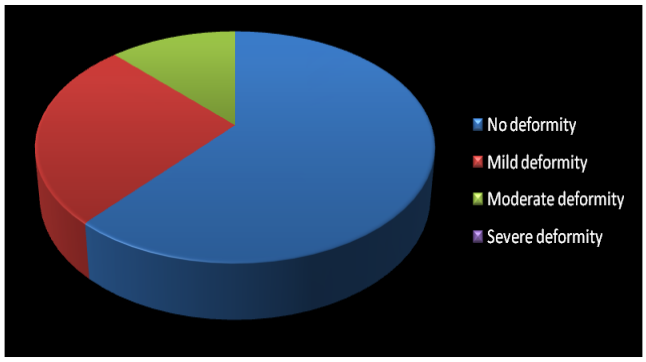


Table no 4: Distribution of individuals according to age, male & female in left foot

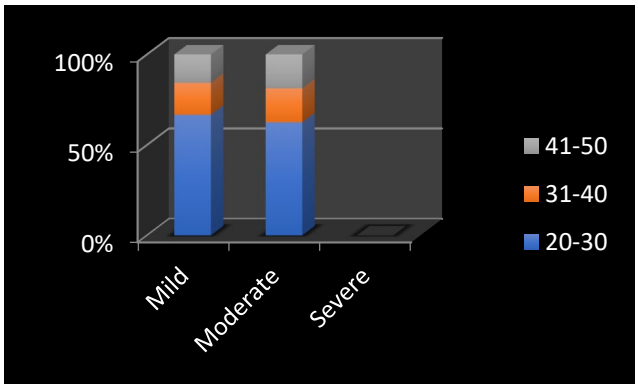


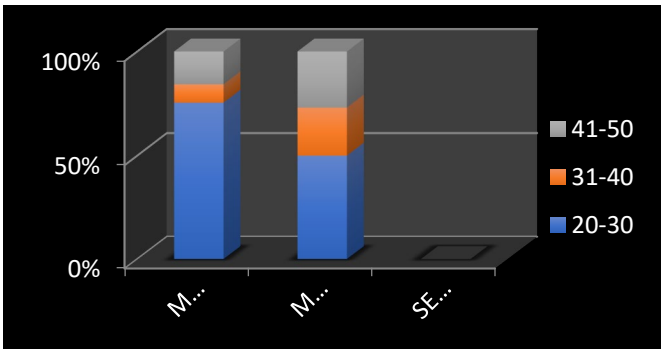
Table no 4: Distribution of individuals according to age, male & female in left foot

AGE	MILD	MODERATE	SEVERE
20-30	43	13	0
31-40	5	6	0
41-50	9	7	0

Table 5: According to Body Mass Index

BMI(Kg/m)						
	Under weight	Normal	Over weight	Obesity		
	(<18.5)	(18.5-24.9)	(25.0-29.9)	Class1 (30.0-34.9)	Class2 (35.0-39.9)	Class3 (40.0-Above)
No	44	141	14	1	0	0

Figure 5. Distribution of mild, moderate and severe deformity according to age in males and females



The study included 143 females and 57 males. The result of right foot in males shows 61.40% having no deformity, 26.31% mild deformity, 12.28% having moderate deformity and 0% severe deformity in right foot. The result of right foot in females 68.53% having no deformity, 25.17% shows mild deformity, 6.29% moderate deformity and 0% severe deformity.

The result of left foot in males showed 54.38% having no deformity, 24.56% mild deformity, 21.05% having moderate deformity and 0% severe deformity. The result of left foot in females 60.83% having no deformity, 28.67% show mild deformity, 10.48% show moderate deformity and 0% show severe deformity.

The result of right foot according to the age between 20-30 shows 22.36% having mild deformity, 6.57% show moderate deformity and 0% shows severe deformity, In left foot 28.28% showed mild deformity, 8.55% moderate deformity and 0% severe deformity. The age between 31-40 years shows 36% mild deformity, 12% moderate deformity and 0 % severe deformity in right foot. 20% mid deformity, 24 moderate deformity and 0% severe deformity in left foot. The age between 41-50 years shows 34.78% mild deformity, 13.04 moderate deformity and 0% severe deformity in right foot. 39.13% mild deformity, 30.43 moderate deformity and o% severe deformity in left foot. The result 0f BMI shows 22% underweight, 70.5% normal, 7% overweight, obesity 0.5% class I, 0% class II and 0 % class III.

DISCUSSION

The foot has two main function to be a strong and stable support for the body and provide lever for ambulation [12]. The purpose of the cross-sectional study was to find the prevalence of hallux valgus in normal healthy individuals. Hallux valgus was determined using the HV angle measured in footprints [13]. The HV is more common in females than males, which may lead to various complications such as impaired balance, contractures of Achilles tendon and risk of fall joint laxity and osteoarthritis [14].

The study was done using Manchester scale in 143 females and 57 males. In right foot males showed 38.59% HV deformity, females showed 31.46%. In left foot males showed 46.06% and females showed 39.50%. According to age group between 20-30, 31-40 and 41-50 showed 28.93%, 48% and 48.48% deformity respectively in right foot, in left foot age groups 20-30, 31-40, 41-50 showed 36.83%, 44% and 69.57% deformity respectively and BMI showed 22% underweight, 70.5% normal, 7% overweight and 0.5% obesity.

HV was diagnosed according to HV angle by footprint method, HV severity was often evaluated applying criteria such as Manchester scale or by measured HV angle in the outlines foot. The technique employed for obtaining footprints, this study is simple, not expensive, easy to apply and satisfactory for routine clinical analyses. Footprint is simple, available, low cost, non-invasive and does not use radiation as well [15].

Similar observation was showed by Sheree Nix, Michelle Smith et.al in their study and their result showed estimate of hallux valgus prevalence in females (30%) was greater than estimate for males (13%). This supports the observation of several individual reported that hallux valgus is more prevalent in females and also study showed older people above 30years reported prevalence of 38% in women compared to 21% in malesb [16]. Abbas Rahimi, Mehdi Rezaee et.al in their study result showed routine use of high heel, round tip shoes showed no influence on the rate of hallux valgus deformity [17]. Daniel Wu, Lobo Louie et.al in their study result shoed wearing high heel seemed to not be a predisposing factor of hallux valgus in females however a family history was a major concern [18].

Bertrand Mafart et.al their study showed the increase in prevalence of a hallux valgus over a time suggest an influence of changes in footwear. The heeled shoes and boots made of stiff leather that men wore in premodern times probably promoted development of HV; however, the prevalence of HV in women in western industrialized countries today is even higher than that is our historical population of older premodern individuals suggesting an extremely deleterious effect of contemporary female footwear [19].

HV is bilateral phenomenon there was difference between right and left foot, our study showed left foot was more commonly affected than right foot in males and females and also showed more in older age.

CONCLUSION

The result of the study concluded that the prevalence of hallux valgus deformity was greater in older aged group (70%) than young aged group (30%) and among which showed left foot was more commonly affected in both males and females. It also states that it does not affect functional activity in normal young individual.

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CONFLICT OF INTEREST

The Author's declare that there is no conflict of interest.

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