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Prevalence of hallux valgus and its association with foot pain in age group between 60-75 – A Cross Sectional Study

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ABSTRACT

Background

The human foot is complex and sensitive which is used for weight bearing, propulsion and shock absorbing. The aim of this study were to determine the prevalence of hallux valgus and its correlation with foot pain in a population-based sample of people aged 60 to 75 year.

Aim

To determine the prevalence of hallux valgus and its correlation with foot pain in age group between 60 to 75.

Methods

In this cross sectional study, 110 subject between age group of 60-75 year were recruited from MVPs hospital and research centre. Subjects were evaluated for hallux valgus by goniometer and pain assessed by numerical pain rating scale.

Result

The prevalence of hallux valgus in the age group of 60-75 is 40% using Pearson's correlation coefficient test between hallux valgus angle and pain on NPRS. The correlation between hallux valgus and pain for right leg was (r=0.4123) (P value=0.0065) and for left leg was (r=0.4515) (P value=0.00065). Hence it is proved to be significant correlation between hallux valgus and foot pain

Conclusion

There was 40% of prevalence of hallux valgus in 60-75 age group and we also found that there was a significant correlation between hallux valgus and foot pain.

Keywords: Hallux valgus angle, Foot pain, Numerical pain rating scale

INTRODUCTION

The human foot is a sensitive and complex structure which is used for weight bearing, propulsion and shock absorbing. Hallux valgus (HV) is a common deformity characterized by angulation of the hallux at the first metatarsophalangeal joint towards the second toe. Following the angulation of the first metatarsal bone towards the medial side, lateral deviation and internal rotation through the longitudinal axis occur

in the hallux. Any alteration in the function of the foot causes changes in normal gait pattern and abnormal stress concentration. According N.H cho at al, the prevalence of hallux valgus was reported to increase with age 12% and 56% those aged over 65 years is western population. In 2004 study by dunn and colleagues, of urban community dwelling adults 65 years of age and older, indicated that Africans Americas had a significantly higher prevalence of hallux valgus in Caucasians. Hallux valgus is thought to contribute to impaired balance and gait, and to increases risk of falls [1, 2]

According to G coskun at el there are some intrinsic and extrinsic factors that affect the development of hallux valgus pathology,extreme pronation of the rear foot, achillies contractures, increased joint laxity, metatarsocuneiform joint hypermobility, low transvers arch, increase in body weight, gender are among the main intrinsic factors [3, 4]. Extrinsic factors include activities carried out in a standing position increase the intensity of pain, wearing high heels and shoes constricting the forefoot [5]. Due to the deformity in the foot, which has an important function is terms of the lower extremity kinematics, deformity cause pain and mobility problems and may result in insufficiency in physical activity. Menz at al studied osteoarthritis patients over the age of 55 and reported that increasing intensity of HV deformity has a negative effect on both general and foot-related quality of life [6]. Severe HV deformity is usually indicated for operative correction, and is usually painful and costly, and may cause complication or dissatisfaction.

According to the Sheree nix at el the largest study so far undertaken of a general population sample reported a prevalence of 28%. The prevalence of hallux valgus deformity has a significant impact on balance and gait patterns and risk factor for falls in older people. Older adult with foot pain have a higher prevalence of reported inability to carry out activities of daily living then those without foot pain

Therefore, the primary objective of the study was to determine the prevalence of hallux valgus in age group between 60-75 and also its correlation with foot pain

METHODOLOGY

Study design: Cross-sectional study
Study setting: MVP'S hospital and research centre, Nashik
Duration of study- 6 months
Sample size: 110 Sampling technique: convenient sampling technique
Ethical clearance was taken before the study and informed consent was obtained from the subjects. 110 subjects were evaluated for hallux valgus angle measured by goniometer and pain intensity were recorded on numerical pain rating scale. Demographic data including gender, age, were recorded. Inclusion criteria were as follows: age range of 60-75 year. With and without foot pain, both gender. Exclusion criteria were as follows: Recent trauma to foot, fracture of lower limb, any neurological condition.

Subject were assessed for angular deviation of hallux valgus using valid and reliable goniometer method and pain intensity were measured on numerical pain rating scale. A goniometer was used to determine the angle of HV. Each subject sat on a standard straight back chair with hips, knees and ankles at approximately 90 degrees of flexion, with feet comfortably relaxed on the floor. To measure the HV angle, the pivot of the goniometer was placed on the middle point of the dorsal aspect of the first head of the metatarsal bone. The fixed arm of the goniometer was then placed on the longitudinal line of the first metatarsal bone, while the movable arm was placed on the longitudinal line of the great toe. The right and left foot of each subject were tested[8].

Subjects were asked to describe his or her foot pain intensity on valid and reliable numerical pain rating scale. Each foot was assessed separately for pain on numerical pain rating scale.

DATA ANALYSIS

The collected data was analysed statistically using Graph Pad Instat. Prevalence of hallux valgus was calculated by percentage in 110 Subject, prevalence of hallux valgus in female and male, subject with foot pain and without foot pain. Correlation with hallux valgus angle and foot pain on numerical paint rating scale score were calculated using person's correlation coefficient.

STATISTICAL ANALYSIS

Table 1- prevalence of hallux valgus in age group of 60- 75

Prevalance of hallux valgus	Frequency	Percentage
YES	45	40%
NO	65	60%

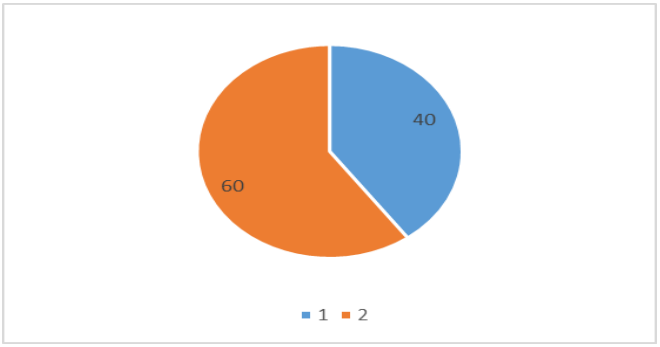


Table 2- correlation of hallux valgus angle and pain on numerical pain rating scale for right leg

Hallux valgus angle mean	Pain on NPRS mean	Persons correlation coefficient	p. value	Significance
5.01±	1.16±	0.4123	0.0065	Significant

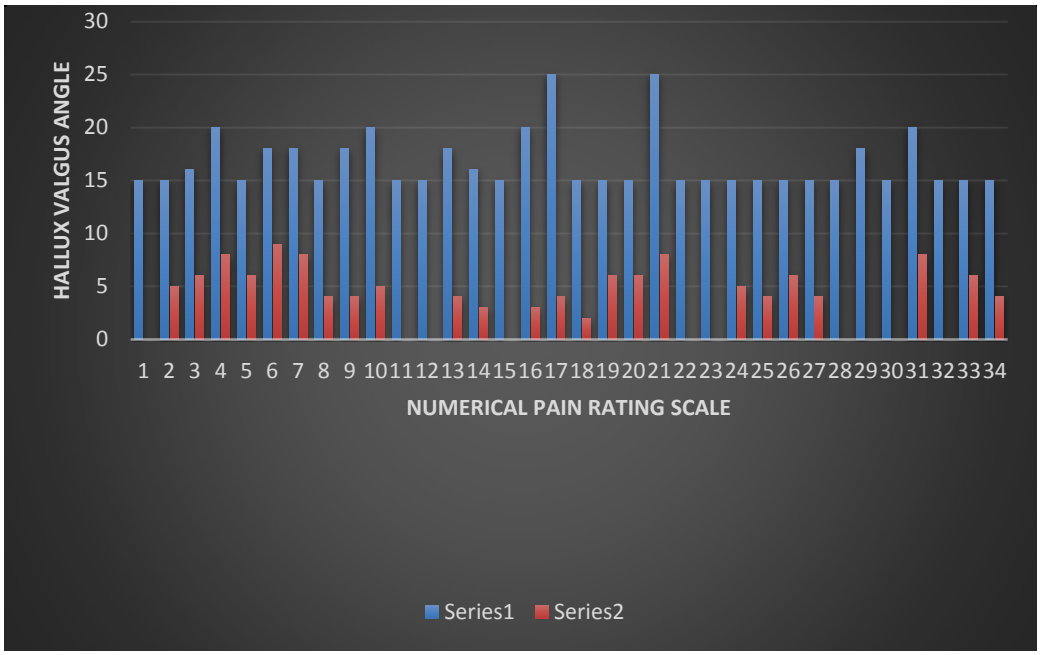
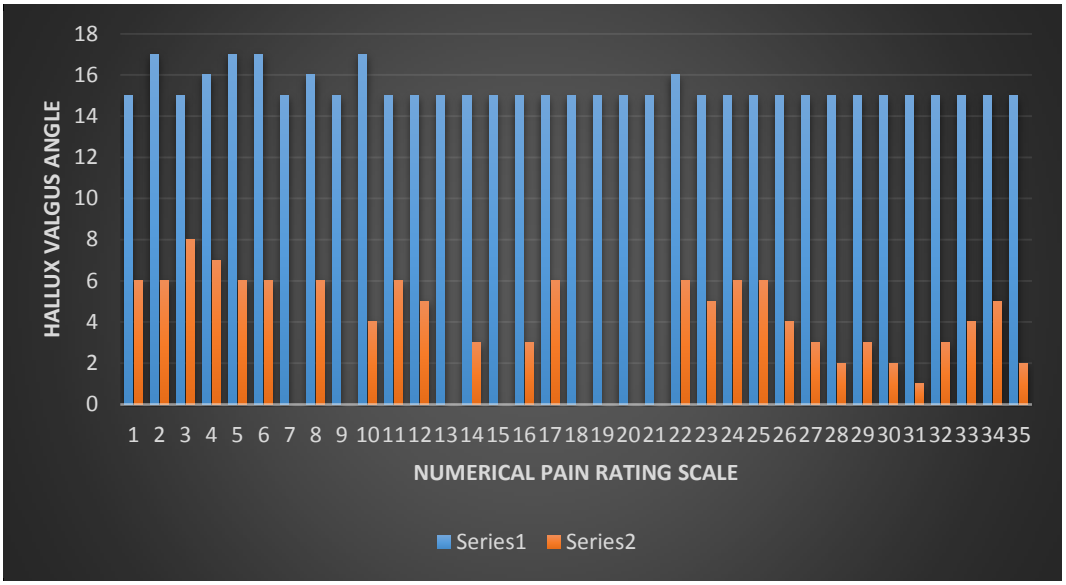


Table 3 correlation of hallux valgus angle and pain on numerical pain rating scale for left leg

Hallux valgus angle mean	Pain on NPRS mean	Pearson's correlation coefficient	P. value	Significance
4.87±	1.16±	0.4515	0.00065	Significant



DISCUSSION

The study revealed that prevalence of hallux valgus to be 40% in the age group of 60-75. Aim of the study was to determine the prevalence of hallux valgus by using standard goniometer method. Previous studies reported prevalence of hallux valgus estimates ranging from 21- 65%. Consistent with previous reports we also found that the prevalence of hallux valgus increase with age and was higher in women than men. Roddy et al, investigated the relation between age and hallux valgus in women and found that, compared to the below-40 age group, HV prevalence was 1.76 times higher in the 40-49 age group and 3.5 time higher in the 50-59 age group. Study have shown that HV deformity becomes more prevalent in older age group [9].

Previous studies reported that the prevalence involving participants across a wide age range have consistently found that the older people have much higher rates of foot problems which has been attributed to the cumulative effects of ageing on the integumentary, vascular and musculoskeletal structure of the foot. however, in younger people foot pain is more likely to be related to overuse musculoskeletal conditions associated with physical activity.

Several studies have found that women have a higher prevalence of foot pain then men, this has been attributed to the wearing of shoes with an elevated heel and narrow toe box, which has been shown to be associated with the development of corns, lesser toe deformity and hallux valgus. In previous study there was strong liner relationship between foot pain and increased age was observed. Hallux valgus may or may not be cause symptoms. Early symptoms may be foot pain in involved area when walking or wearing shoe. Shoe pressure in that area can cause intermittent pain while the development of arthritis in more severe hallux valgus can lead to chronic constant pain. In our study we also found that higher the hallux valgus angle, higher the score of pain in numerical pain rating scale. Previous study reported that role of pain in relation to the detrimental impact of HV is complex. People with hallux valgus are more likely to report foot pain and big toe pain, there was also more likely to report pain in other body regions such as the knee, hip. One study reported by Sami s et al. concluded that there was 39% subject indicated for foot health education. they also reported that peak pressures under the first, second and third metatarsal heads in feet with HV are greater than those in the normal feet. More peak pressure on the first metatarsophalangeal joint in asymptomatic patients with HV than normal subject during normal gait has also been reported. they also reported that such changes in foot pressure are reported impair foot function and cause foot pain. Limited range of motion of the metatarsophalangeal joint has been reported to severely impaired foot function, change in gait patterns pathological changes in the joint. Limitations to our study was limited sample size.

Although hallux valgus is the most common foot deformity in the elderly, pain is also associated with other conditions such as plantar fasciitis and pescavus. Since the HV angle of the participants in this study was less than 25 degrees, early intervention measures could be considered to prevent further complications.

CLINICAL IMPLICATION

As the study determine there was 40% of prevalence of hallux valgus in age group of 60-75 year and also there was a correlation between hallux valgus and foot pain, so it is necessary to spread awareness about proper footwear modification and orthotics which can prevent progression of hallux valgus and relive pain by improving joint function.

CONCLUSIONS

This study concluded that there was higher prevalence of hallux valgus in elderly population. Study also demonstrate that there was significant correlation between hallux valgus angle and numerical pain rating scale score.

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