

Prevalence of hallux valgus among medical students of the University of Jos

ABSTRACT

Introduction: Hallux Valgus is defined as a deformity characterized by abduction contracture in which the great toe is turned away from the mid-line of the body. The aim of this study was to examine and evaluate the prevalence of hallux valgus among the Medical Students of University of Jos, Nigeria in age and gender subgroups. **Materials and Methods:** This study was a cross sectional and observational study involving 200 volunteers (100 females and 100 males) aged between 18 and 30 years with mean age of 24.6 years and standard deviation of 3.4 years. Informed consent was obtained and subjects were examined and assessed for the presence or absence of hallux valgus adopting a standard photograph. Data obtained from this research study was analyzed using IBM SPSS version 20. **Results:** An overall prevalence of hallux valgus deformity in the studied population was 16% with a higher prevalence in females (11%) than their male counterparts (5%). There is a higher prevalence of hallux valgus deformity in the older age group than can be seen in the younger age group. **Conclusion:** Young women and indeed the general public need to be more aware of the Hallux Valgus deformity and its relationship to footwear and therefore take proactive measures to prevent this deformity.

Key words: Hallux valgus, Jos, medical students, university

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INTRODUCTION

Hallux valgus (HV) or hallux abducto valgus deformity [Figure 1] commonly called bunion [Figure 2] is a deformity characterized by medial deviation of the first metatarsal and lateral deviation of the hallux (big toe), which is often erroneously described as an enlargement of bone or tissue around the joint at the head of the big toe.^[1,2]

In the 19th century, the understanding of HV was that it was purely an enlargement of the soft tissue, first metatarsal head, or both, most commonly caused by ill-fitting footwear. Gradually, surgeons began to recognize that this medial condition could develop as a result of numerous different factors that they tended to be familial and that they often were associated with other foot deformities.^[3,4]

The pathogenesis of HV has been well described as involving weakening of the tissues [Figure 3] on the medial side of the first metatarsophalangeal (MTP) joint and erosion of the ridge on the metatarsal head between the medial and lateral sesamoids. The proximal phalanx drifts into valgus and the metatarsal head into varus. The medial bursa develops in response to the excessive pressure of shoes over this prominence. The tendons of extensor hallucis longus and flexor hallucis longus are carried laterally with the phalanx, thus becoming adductors and exacerbating the deformity. The resultant imbalance causes dorsiflexion and pronation of the first toe rendering its pulp nonfunctional.^[5-7]

Etiological factors implicated in the development of the deformity include muscle imbalances, inherited structural variations in the alignment of the metatarsals, flat foot, and

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ill-fitting footwear. The development and progression of the deformity are more likely due to a combination of factors rather than any single one.^[8,9]

Classification (staging) of hallux valgus

HV deformity is classified by the degree of deformity as assessed by weight-bearing anteroposterior radiographs [Figure 4] as follows:

- I. Mild deformity is defined by intermetatarsal angle (IMA) of $<13^\circ$ and HV angle (HVA) of $<30^\circ$
- II. Moderate deformity is defined by IMA $>13^\circ$ but HVA of $<40^\circ$
- III. Severe deformity is characterized by IMA of $>20^\circ$ and HVA $>40^\circ$.

However, the severity and natural history of the deformity and therefore the treatment plan are also influenced by the stability and the congruency of the first MTP joint.^[2]

The National Health Surveys in the United States have reported a prevalence of 0.9% across all age groups^[10] while a more recent survey in the UK reported a prevalence of 28.4%

in adults.^[11] Research conducted in elderly populations has indicated prevalence rates as high as 74%.^[5] Individual studies have reported that HV is more common in female and elderly individuals;^[11,12] however, there has been no synthesis of the literature to date or synopsis derived.

Due to the lack of firm epidemiological data relating to HV, it is difficult to estimate the impact that this condition has on a given population; thus, to establish the need for future research, a better understanding of HV prevalence is warranted.^[13]

To date, there has been no published or written systematic review study investigating the prevalence of HV and its influence to age and gender in Jos, Nigeria. Therefore, the aim of this study was to examine and evaluate the prevalence of HV among medical students of the University of Jos, Nigeria, in age and gender subgroups.

MATERIALS AND METHODS

This study was a cross-sectional and observational study conducted among medical students of the University of

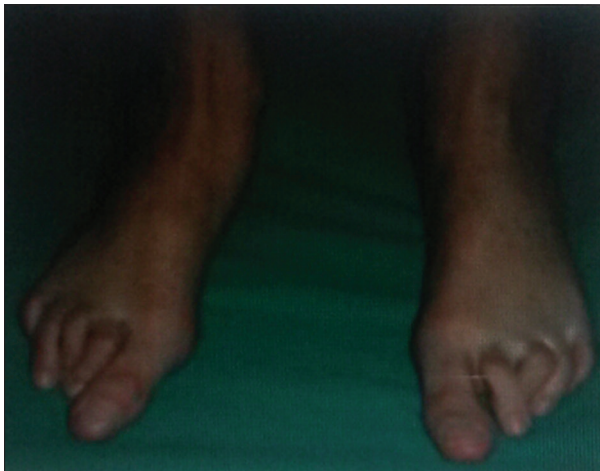


Figure 1: Bilateral hallux valgus deformity^[4]

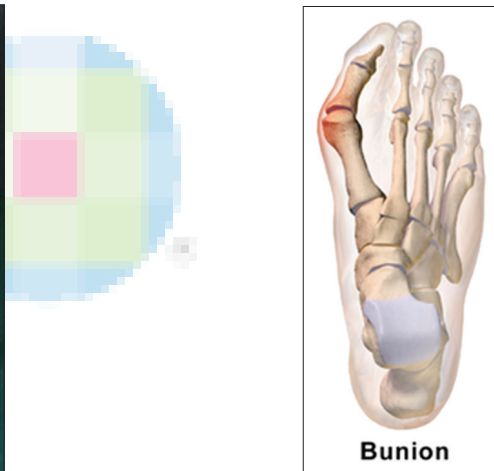


Figure 2: Structure of bunion

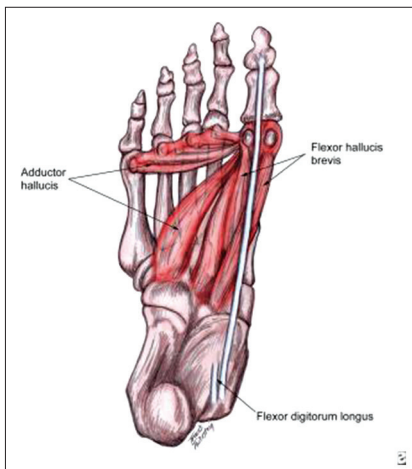


Figure 3: Some structures associated with hallux valgus



Figure 4: Classification (staging) of hallux valgus

Jos. Two-hundred volunteers comprising 100 females and 100 males took part in this study with ages ranging between 18 and 30 years (mean age was 24.6 with standard deviation of 3.4 years). Exclusion criteria for this study were adopted for such individuals whose normal feet have been altered by trauma, accidents, and foot surgery and those below the age of 18 and above the age of 30. After informed consent had been obtained, subjects were examined and assessed for the presence or absence of HV adopting the photograph used by Garrow *et al.* [Figure 5]. The validity of this method has been documented.^[14] Data obtained from this research study were analyzed using IBM SPSS (Statistical Package for Social Sciences) version 20 (SPSS Inc., Chicago, IL) for windows. Descriptive statistic was used to express the number of cases of HV. Distribution of HV was evaluated in age and gender subgroups for the studied population.

RESULTS

The result of this study is shown in Tables 1 and 2. Table 1 shows an overall prevalence of HV deformity in the studied population of 16% with a higher prevalence in females than their male counterparts.

There is a higher prevalence of HV deformity in the older age group than that of younger age group [Table 2].

DISCUSSION

The result of this study revealed that the prevalence of HV in the studied population is lower than those found in other similar studies. Prevalence varying widely between 21% and 70% had been reported for adult American, French, and Danish population and only a few studies exist on the prevalence of HV among adolescents.^[8] Although the prevalence of HV in the adult population in Nigeria is yet to be fully known, the present study, however, agrees with previous findings which showed that the prevalence of HV in a sample of youth population in Nigeria is lower than those in adults in aforementioned populations.^[13]

Females in this study had a higher prevalence of HV than males. Previous studies corroborate this assertion.^[14,15] However, Mafart^[16] showed that the prevalence of HV was higher in males than females when he conducted a paleopathological study of 605 first metatarsal bones in a French population. He explained that HV became more common in men after the introduction of stiff high-heeled shoes and soccer and athletic boot, which were as harmful as contemporary women's shoes. The harmful effects of western footwear are illustrated by the low prevalence of HV deformity in contemporary populations that live barefoot and increase in reported cases associated with the widespread introduction of western footwear in Japan.^[17]



Figure 5: Hallux valgus grading photographs showing the various degrees of deformity. (a) no deformity (b) mild deformity (c) moderate deformity (d) severe deformity

Table 1: Prevalence of hallux valgus deformity by sex

Sex	n	Number of subjects with HV deformity	Prevalence (%)
Females	100	11	11
Males	100	5	5
Total	200	16	16

n=Number; HV=Hallux valgus

Table 2: Prevalence of hallux valgus deformity by age group

Age (years)	n	Number of subjects with HV deformity	Prevalence (%)
18-20	30	1	3.3
21-23	47	2	4.3
24-26	53	2	3.8
27-30	70	11	15.7

n=Number; HV=Hallux valgus

An increasing prevalence of HV was demonstrated in this study among the different age groups with the older group, 27–30 years having a prevalence of 15.7% as against the younger age group 18–20 years which had a prevalence of 3.3%. This supports previous studies that the prevalence increases with age.^[15,18] Thus, attention to HV and measures to prevent it at a young age are important. Opportunities to wear high-heeled footwear markedly increase as women enter university. Since such footwear greatly stresses the big toe, it likely increases the incidence, prevalence, and severity of HV. Young women need to be more aware of the characteristics and severity of HV and its relationship to footwear.^[18]

CONCLUSION

The prevalence of HV was found to be 16% among medical students of the University of Jos with higher prevalence in

females and the older age group of the studied population. Young women and indeed the general public need to be more aware of the HV deformity and its relationship to footwear and therefore take proactive measures to prevent this deformity.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Coughlin MJ, Jones CP. Hallux valgus: Demographics, etiology, and radiographic assessment. *Foot Ankle Int* 2007;28:759-77.
2. OrthopaedicsOne Articles. In: OrthopaedicsOne – The Orthopaedic Knowledge Network; 2007. Available from: <http://www.orthopaedicsone.com/x/RQAI>. [Last retrieved on 2016 Jan 06].
3. Perera AM, Mason L, Stephens MM. The pathogenesis of hallux valgus. *J Bone Joint Surg Am* 2011;93:1650-61.
4. Moscadini S, Moscadini G. Hallux valgus correction in young patients with minimally invasive technique. In: Waddell J, editor. *The Role of Osteotomy in the Correction of Congenital and Acquired Disorders of the Skeleton*. Croatia: InTech; 2012. Available from: <http://www.intechopen.com/books/the-role-of-osteotomy-in-the-correction-of-congenital-and-acquired-disorders-of-the-skeleton/hallux-valgus-correction-in-young-patients-with-minimally-invasive-technique>. [Last accessed on 2016 Jan 26].
5. Menz HB, Morris ME. Footwear characteristics and foot problems in older people. *Gerontology* 2005;51:346-51.
6. Kennedy JG, Collumbier JA. Bunions in dancers. *Clin Sports Med* 2008;27:321-8.
7. Stephens MM. Pathogenesis of hallux valgus. *Eur J Foot Ankle Surg* 1994;1:7-10.
8. Owoeye BA, Akinbo SR, Aiyegbusi AL, Ogunsola MO. Prevalence of hallux valgus among youth population in Lagos, Nigeria. *Niger Postgrad Med J* 2011;18:51-5.
9. Nix S, Smith M, Vicenzino B. Prevalence of hallux valgus in the general population: A systematic review and meta-analysis. *J Foot Ankle Res* 2010;3:21.
10. Adams PF, Hendershox GE, Marano MA. Current Estimates from the National Centre for Health Interview Survey, 1996. National Centre for Health Statistics. *Vital Health Stat* 1999;10:1-203.
11. Roddy E, Zhang W, Doherty M. Prevalence and associations of hallux valgus in a primary care population. *Arthritis Rheum* 2008;59:857-62.
12. Nguyen US, Hillstrom HJ, Li W, Dufour AB, Kiel DP, Procter-Gray E, *et al.* Factors associated with hallux valgus in a population-based study of older women and men: The Mobilize Boston Study. *Osteoarthritis Cartilage* 2010;18:41-6.
13. Dare WN, Ebeye OA, Nsi CF. The prevalence of hallux valgus among three ethnic groups in Delta State, Southern Nigeria. *Am Euras J Sci Res* 2015;10:118-20.
14. Garrow AP, Silman AJ, Macfarlane GJ. The cheshire foot pain and disability survey: A population survey assessing prevalence and associations. *Pain* 2004;110:378-84.
15. Menz HB, Lord SR. Foot pain impairs balance and functional ability in community-dwelling older people. *J Am Podiatr Med Assoc* 2001;91:222-9.
16. Mafart B. Hallux valgus in a historical French population: Paleopathological study of 605 first metatarsal bones. *Joint Bone Spine* 2007;74:166-70.
17. Menz HB, Tiedemann A, Kwan MM, Latt MD, Sherrington C, Lord SR. Reliability of clinical tests of foot and ankle characteristics in older people. *J Am Podiatr Med Assoc* 2003;93:380-7.
18. Okuda H, Juman S, Ueda A, Miki T, Shima M. Factors related to prevalence of hallux valgus in female university students: A cross-sectional study. *J Epidemiol* 2014;24:200-8.