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The Incidence Of Flatfoot Amongst Athletes In Port-Harcourt

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ABSTRACT

The incidence of flat foot amongst 200 athletes in Portharcourt was determined using the contact 11 index development by Qamara. The athletes were drawn from various sports clubs in Portharcourt town. The mean and standard deviation of conact index 11 were determined, and the degree of flat foot graded as either probable (Mean $\pm$ ISD TO 2SD) or definite (Mean $\pm$ 3SD or more). Incidence of definite unilateral flat foot was found to be 3% (males) and 4% (females). The incidence of bilateral flat foot was found to be 7% (Males) and 8% (Females).

Keywords:

Flat foot (Pes planus) is a congenital or acquired deformity characterized by depression of the arches (Mann 1978). The cause of the acquired flat foot may be atrophic, traumatic or the effect of obesity or ill-fitting shoes (Zbynek, 1980).

Clinical features associated with flat foot may include changes in sole print, valgus and eversion of the fore foot. There is associated pronated gait, joint stiffness, loss of spring and proximal muscle spasm leading to pain. The pain may be local in the arch, or extend to the medial malleolus, knee, hip or lumbar area.

These rather serious clinical implications make it therefore appropriate for predictive measurement to be made for supportive and preventive purposes. Attempts at predictive measurement have been made radiologically (Bonnet, 1940 and Kaplan, 1945). However, there is rather poor correlation between radiographic measurement and clinical findings as Bonnet and Baler found that 83% of clinically normal feet showed radiological flat feet. Clinical inspection of foot and footprints has been advocated for predictive measurements and are rather subjective (Ilfeld, 1944 and Schwerts, 1928). Mathematical determination of flat foot from footprints is currently favoured (Mann, 1978 and Qaura et al, 1980). Mathematical methods have been quite useful in the measurement of flat foot in the general population.

Trauma is an identified risk factor in developing this condition. Athletes are prone to one king of trauma or the other. In this study, we have looked at the incidence in athletes, to assess if trauma or increased activity in athletes has a significant impact on the incidence.

MATERIALS AND METHODS

200 athletes aged between 20 and 38 years (100males & 100 females), drawn from various sports centers and fields across Portharcourt were used for the study. Endorsing ink and plain duplicating papers were used to obtain their footprints.

The plantar surface of the foot of each athlete was cleaned and dried. The footprint of each foot was then obtained by applying endorsing ink to the cleaned sole, and the subject made to stand on a clean plain duplicating paper, while the other foot remains off-ground. The outline of the foot was then drawn with a lead pencil, and the procedure repeated for the other foot.

Measurements

The midpoint of the posterior margin of the heel X, the most distal portion of the second toe Y, and the big toe Z were marked on the outline of the footprint, and two lines drawn, XY, XZ (Fig. 1).
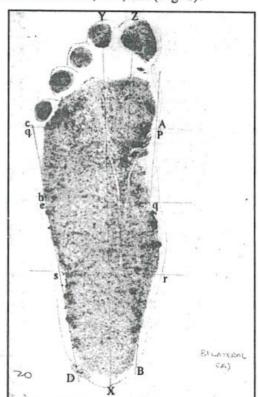

Fig. 1: Measurement co-ordinates

At right angles to the lateral line XY, transverse lines were drawn to divide the footprints into an anterior 3/10, and a middle 4/10. an additional transverse line was drawn at the midpoint across the lateral line XY dividing the foot into two equal halves.

On the medial border of the foot, the innermost points at the heads of the 1st metatarsal (A) and at the heel (B). were connected by an antero-posterior line (AB). The outermost points at the head of the 5th metatarsal (C) and the heel (D) on the lateral border of the feet were similarly joined together by another antero-posterior line (CD) (Fig. 1).

Contact index II is a measure of contact width ($a^1 b^1$) to the total width of the footprints (ae).

RESULTS AND DISCUSSION

Table 1: Mean and standard deviation in males and females

Male	CONTACT INDEX II		Mean ± SD For both feet
	Left foot	Right foot	
Mean	0.53	0.55	0.54
SD	± 0.091	± 0.126	± 0.108
FEMALE			
Mean	0.45	0.46	0.455
SD	± 0.091	± 0.157	± 0.124

Table 2: Peak values for normal foot, probable flat and definite flat foot

MALE		
	Mean ± SD	Peak Mean Value
Normal	Mean ± ISD	0.648
Probable	Mean ± 1-2SD	0.756
Definitive	Mean ± 2-3SD	0.824
FEMALE		
Normal	Mean ± ISD	0.577
Probable	Mean ± 1-2SD	0.703
Definitive	Mean ± 2-3SD	0.827

Table 3: Incidence of bilateral flat foot

	Male	Female	Total
Normal feet	93	92	183
Flat feet	7	8	13
Total	100	100	200
% Incidence	7%	8%	7.5%

Table 4: Incidence of unilateral flat foot

	Male	Female	Total
Normal feet	97	96	197
Flat foot	3	4	7
Total	100	100	200
%	3%	4%	3.5%

Reviews on several aspects of flat foot abound in literature (Bonnet 1946, Didia,1980, Garrick, 1990, Lifield, 1994 & Kaplan, 1945). Rarely do individuals with clinically significant flat foot present to clinics with symptoms, as there is no direct correlation between clinically determined flat foot and symptomatic flat foot.

The newborn has almost flat foot, however, increase in physical activity and the growth of planter fascia, muscles and ligaments given rise to the medial and longitudinal arches. Failure to respond appropriately will lead to persistence of flat foot.

While the presence of flat is not known to prevent successful athletic competition per se, there is an associated increase in the tendency of injury to occur, and this may further worsen the degree of flat foot (Llfield, 1994, Garrick, 1990).

Didia et al, 1987) established an incidence rate of 2.22% for unilateral flat foot in general population (M=1.97%) (F=2.44%), and for bilateral 0.6% (M=0.44%) F=0.75%. This differs quite significantly from our observations in athletics who have more of bilateral flat foot 7.5% (M=7%) (F=8%), than unilateral 3.5% (M=3%) (F=4%). However, both values for bilateral and unilateral flat foot differ significantly. This difference could be due to greater use of both legs in athletics leading to simultaneous injury or pressure on the legs resulting in an increased incidence of flat foot.

In athletes therefore, there is the need for an increasing screening for flat that may require corrective surgeries to prevent worsening and the other compilations associated with flat foot.

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