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## PES PLANUS (FLATFOOT) IN MALE AND FEMALE ADULTS OF BAYELSA- NIGERIA

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### SUMMARY:

The aim of this research was to provide and document an accurate record of the noticeable occurrence of *pes planus* amongst adults in Bayelsa State (Nigeria).

A random sample of 510 persons (235 males and 275 females; aged  $33 \pm 15$  years and totally Bayelsa's natives) was analyzed. An ink imprint on white paper of their weight-bearing surface of the feet was carried out with diagnostic purposes. 48 males (20.4%) and 81 females (29.5%) revealed *pes planus* whereas the rest of the sample did not show it. The incidence of *pes planus* was 1:4.

The well known frequent excess of bodyweight in these native groups may be responsible for this abnormality and obliges to pay due attention to the related habits. Furthermore, the obtained results could probably have anthropological and forensic medicine impact.

**KEYWORDS:** Pes planus, Males, Females, Adults, Bayelsa State.

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### RESUMEN:

Este trabajo intenta presentar un registro ajustado de la perceptible ocurrencia de *pes planus* en adultos del Estado de Bayelsa (Nigeria).

Una muestra aleatoria de 510 personas (235 hombres y 275 mujeres, con edad  $33 \pm 15$  años y todos indígenas del estado) fue analizados. Una impresión en tinta sobre papel blanco de las plantas de sus pies fue usada con propósitos diagnósticos. 48 hombres (20.4%) y 81 mujeres (29.5%) revelaron *pes planus* mientras que el resto no lo hizo. La incidencia de tal patología fue 4:1.

El ya conocido y frecuente aumento de peso en estos grupos indígenas puede ser responsabilizado por esta anomalía y fuerza

a poner el acento en los hábitos relacionados con la obesidad. Además, se considera que los resultados obtenidos podrían poseer impacto antropológico y médico forense.

**PALABRAS CLAVE:** Pie plano, hombres, mujeres, adultos, Estado de Bayelsa

## INTRODUCTION

Deformities of the fingers and toes are common conditions encountered by orthopedics and pediatricians in clinics. Some of these abnormalities are acquired, caused by traumatic injuries, neuromuscular pathologies, systemic diseases, or mechanical problems secondary to extrinsic pressures, while others are congenital<sup>1</sup>.

Pes planus (flat foot), defined as the postural appearance of the foot, with depressed medial longitudinal arch and a pronated subtalar joint and the calcaneus assuming a valgus position underweight bearing conditions, is the most common foot pathology not only in patients of all ages in general but in paediatric orthopaedic practice in particular<sup>1</sup>.

In this sense, it is about five times as frequent in children as cavus foot and is felt to be present in about one out of nine children 1. Far from Nigeria, it was reported that flat foot was found to be the most prevalent congenital abnormalities in Turkish school children aged 6-15 years<sup>2</sup>.

Children with flexible and painless flat feet do not require any treatment. Commonly asymptomatic, they are brought to the paediatricians by concerned parents because of the familiar layman perception that flatfoot will be associated with pain in adulthood. Conversely, it is imperative that rigid flat foot be evaluated to ascertain the presence of congenital vertical talus, tarsal coalition, or skew-foot, because all of these usually require surgical intervention<sup>3-5</sup>.

Pes planus becomes a musculoskeletal disorder of the feet in adolescents and adults resulting in a "fallen arch", particularly, the medial part of the longitudinal arches. In this foot pathology, the plantar calcaneo-navicular and long plantar ligaments appear abnormally stretched during long period of standing, traumatic injuries, systematic disease or mechanical problems secondary to extrinsic pressure. This may cause weakness or tearing of the plantar calcaneo-navicular ligament that supports the head of the talus, producing inferio-medial displacement of the head of the talus<sup>3-5</sup>.

Adults may develop painful flat feet after loss of posterior tibialis function<sup>6</sup>.

Experts in biomechanics and pathomechanics of the lower extremity understand the importance of subtalar joint pronation in association with midtarsal joint collapse, and the decreased stability effect in the proximal lower extremity joints (knee, hip, lower back). Functional foot orthoses can correct excessive pronation and may help with knee, hip or back pain. Custom functional foot orthoses that incorporate minimal cast fill, medial heel skive, and/or inversion can reposition the foot in a less pronated position. This correction may have either a preventive effect or a reversal effect on back or knee pain<sup>7</sup>.

Exceeding the relevance of an accurate diagnosis of *pes planus* during childhood and adolescents, this research aims to provide and document a reliable record on these studied patients taking into account the noticeable occurrence of *pes planus* amongst adults in Bayelsa State (Nigeria).

## MATERIALS AND METHODS

A random sample of 510 adults (235 males and 275 females; aged  $33 \pm 15$  years and totally Bayelsa's natives) were analyzed. An ink imprint on white paper of their weight-bearing surface of the feet was diagnostically carried out.

The current international ethical regulations were followed in this study.

**Statistics:** data were analyzed using unpaired t test, using Graph Pad InStat® software. P values < 0.05 were considered significant.

## RESULTS.

As seen in Table 1, 48 males (20.4%) and 81 females (29.5%) (i.e: 129 patients - 25.3% -) revealed *pes planus* whereas the rest of the sample did not show it. Within the age groups, those aged between 18 and 22 put into evidence the higher percentage of *pes planus* in both sexes. However, no significant differences ( $p > 0.05$ ) were detected between sexes in the studied sample.

**Table 1: Presence of *Pes Planus* in adult males and females native groups**

Age Groups	Total	Males	Percentage	Females	Percentage
18-22	204	17	8.3	40	19.6
23-27	209	16	7.7	30	14.4
28-32	64	12	18.8	8	12.5
33-37	15	0	0	2	13.3
38-42	13	2	15.38	1	7.7
43-47	5	1	20	0	0
	510	48	9.4	81	15.9

Paired t test: The two-tailed P value is 0.2610 considered not significant

In Table 2, a comparison of the Prevalence of *Pes planus* in different populations of the world including Bayelsa State (Nigeria) was achieved. Data related with Bayelsa (Nigeria) are high.

**Table 2: Comparison of the Prevalence of *Pes planus* in different populations of the world including Bayelsa State (Nigeria)**

Country	Male %	Female %	Both sex %	Reference
Akwai bom Nigeria	5.8	7.6	13.4	Eluwa et al. <sup>1</sup>
Anambra- Nigeria	6.8	7.1	13.9	Ukoha et al. <sup>16</sup>
Tanzania	-	-	20.3	Igbigbi et al. <sup>18</sup>
Cross rivers- Nigeria	8.80	13.40	22.20	Eluwa et al. <sup>15</sup>
Malawi	-	-	24.3	Igbigbi and Msamati <sup>9</sup>
Yoruba- Nigeria	13	12	25	Umar and Adeyemi <sup>8</sup>
<b>Bayelsa- Nigeria</b>	<b>9.4</b>	<b>15.9</b>	<b>25.3</b>	<b>Present study</b>
Israel	17.17	11.65	28.82	Lakstein et al. <sup>12</sup>
Kenya	-	-	43.2	Igbigbi et al. <sup>18</sup>
Anatolia Turkey	35.5	28.5	64	Aymelek <sup>17</sup>

#### DISCUSSION:

In accordance with the results obtained in the random sample here studied and reported in Tables 1 and 2 the percentage of persons affected by *pes planus* (flat foot) in Bayelsa State was 25.3% (ratio 4:1). This percentage acquires relevance because of its compatibility with the prevalence (25% -13% in males and 12% in females-) recorded in a study carried out among school children<sup>8</sup>. It also agrees with other communication where the incidence of *pes planus* was 242.6/1000 (24.26%) using the arch index method<sup>9</sup> as well as with data reported in Israel 28.82% (17% in males and 11.65% in females)<sup>12</sup>. Conversely, there exists reports with lower data as those carried out among school children in Port Harcourt where unilateral *pes planus* was 2.22 % and bilateral ones 0.6%<sup>10</sup> and other performed in Akwa Ibom (11.2%)<sup>11</sup>.

Concerning gender, the results here stated with no significant differences between sexes but higher in females harmonize with supported by Ndife (1998) revealing that females are more prone to *pes planus*<sup>13</sup> and contradicts others where males prevail over females in this regard<sup>12,14</sup>.

The well known frequent excess of bodyweight in these native groups resulting of a different way of life including fast foods, reduction in movement and spotting activity and inappropriate foot may be responsible for this increasing abnormality and obliges to pay due attention to the related habits. In this regard, in Nigerian Yoruba tribe flexible flat foot prevails in males who are obese, particularly in those aged 7-8<sup>8</sup>.

To sum up, it is here revealed that one out of every four adult Bayelsans has *pes planus*, Its potential relevance for anthropology and forensic medicine lead us to suggest subsequent further studies to classify various types of *pes planus* since it could be used for classifying humans from different regions.-

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**Comment of the reviewer Prof. Dr. Alberto Enrique D'Ottavio, PhD. Catedrático de la Facultad de Ciencias Médicas, Investigador del Consejo de Investigaciones de la Universidad Nacional de Rosario. Rosario. Argentina.**

**Este trabajo, de sencilla concepción y de indudable valor local, puede adquirir determinado impacto regional y hasta excederlo según lo consideren los lectores interesados en ortopedia médica.**

**Los pies planos, tema que aborda analizando una muestra aleatoria dentro de una población indígena nigeriana, poseen valor etiopatogénico, diagnóstico y terapéutico, cuando se debe recurrir a esta última etapa y deja entrever una repercusión antropológica y médica forense que, a mi modesto entender, no debiera ser infravalorada.**

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**Comment of the reviewer Larisa Ivón Carrera PhD. Profesora e Investigadora, Facultad de Ciencias Médicas, Universidad Nacional del Litoral, Santa Fe (Argentina)**

**El pie plano del adulto es abordado por este equipo de investigación en un Estado de Nigeria mediante una técnica básica que, no obstante no haber sido complementada por otras de mayor complejidad, arroja resultados preliminares aceptables en el contexto antedicho.**

**Puede que lo más rescatable de esta empresa sea, excediendo los resultados obtenidos y las comparaciones efectuadas, la posibilidad forense y antropológica que sus autores plantean como culminación de su tarea.**

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