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RESEARCH PAPER

THE PREVALENCE OF POLYDACTYLY IN THE SOUTHERN IJAWS OF BAYELSA STATE, NIGERIA

***Robert F.O, Waritimi G.E, Dare N.W**
Department of Human Anatomy, Faculty of Basic Medical Sciences, College of Health Sciences, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria
* Correspondence: fthrobert@yahoo.co.uk

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ABSTRACT

Polydactyly, once regarded as a congenital anomaly, is now regarded as a biological variant following Eurocat classification. The prevalence of polydactyly in many human populations is unknown largely because it was regarded as a congenital anomaly and hence interest was only on birth incidence. The purpose of this study was to determine the prevalence of polydactyly among the Southern Ijaw indigenes of Bayelsa State, Nigeria. One thousand subjects comprising 460 females and 540 males were randomly selected for this study. Subjects were physically screened for presence or absence of polydactyly. Results showed that the population prevalence of polydactyly was 7.5% and shows a higher occurrence in males compared to females. However, gender predilection was not evident at $p < 0.05$ level of significance. It was concluded that polydactyly, a human morphologic variant, has a high general population prevalence of 90/1000 in the Southern Ijaw indigenes of Bayelsa State, Nigeria.

Key words: Morphologic, Variation, Limb-anomalies, Occurrence

INTRODUCTION

The contributions of physical anthropology to man's sociocultural development cannot be overemphasised. The applications of anthropological principles have been invaluable to man in medical (Shiono, 1986; Lopuszanska and Jankowska, 2001) and medico-legal investigations (Schiwy-Bochat *et al*., 2004; Stewart, 2005; Schmitt *et al*., 2006). It has also become an invaluable companion to other methods used for diagnosis of some human diseases and syndromes which are genetically determined (Connor, 1997; Kava *et al.*, 2004). Though physical anthropology deals mainly with traits and variations in human morphological features seen in diverse human populations, it has become imperative to evaluate some traits which until recently were medically tagged as minor congenital malformations (EUROCAT, 2007).

These traits which are known to occur in about 15% of newborns (Sadler 2006), includes epicanthal folds, ocular hypotelorism, preauricular tags and pits, low-set ears, simian crease, clino- and camptodactyly, partial syndactyly and polydactyly (EUROCAT, 2007). These features have also been clinically evaluated and are found to be medically inconsequential and have insignificant functional or cosmetic consequences, and as such were expunge from the category of congenital abnormalities (Czeizel, 2005; EUROCAT, 2007). However, these minor anomalies are not excluded if they appear in association with major anomalies (EUROCAT, 2007; EUROCAT, 2012). These 15% medically inconsequential traits are not inconsequential in Human biology. Interestingly some of these morphologic variants or traits were features that had been reported in certain human anthropological studies (Kamali, 1985; Krishan and Kumar, 2007; Oyinbo and Fawehinmi, 2009), because human morphologic difference whether acquired or genetic have aided in our understanding of

the connections between human biology and culture (Leck, 1993; Godina, 1994; Schiwy-Bochat *et al.*, 2004; Laska–Mierzejewskaand Olszewska, 2007; Koscinski, 2008).

The cause of two-thirds of all birth defects is idiopathic (Sadler, 2012), which suggests, though arguably, that the medically in-consequential anomalies may really just be human biological variations. Traits such as simian crease, epicanthal folds, ocular hypotelorism, preauricular tags and pits, low-set ears, facial profile (Kamali, 1985; Krishan and Kumar, 2007) have been studied in various human populations. Unfortunately, polydactyly was left almost entirely for medical research, but due to recent reasoning, polydactyly and the likes, no longer engender the interest of medical research, as they are in-consequential in medical palaces (EUROCAT, 2005; 2012; Czeizel, 2005).

As expected, the incidence of polydactyly per 1000 live births is known for several human populations or socio- cultural groups (Leck and Lancashire, 1995; Bakare *et al.*, 2009), but it is opined that in near future this may no longer be available for reasons mentioned above and may soon be ignored in the physical examination of new born babies, thus creating a lacuna. Consequently, it is imperative to re-appraise such morphological variants in the general population. Diversities in human traits are invaluable and are the essence of biological anthropology. Not unexpected, the population prevalence of most so-called minor anomalies in medical science, is largely unknown. Hence, the aim of this study was to determine the population prevalence of polydactyly in Southern Ijaw indigenes of Bayelsa State, Nigeria.

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MATERIALS AND METHODS

Study Setting/Subjects: This retrospective study was conducted in Bayelsa State Nigeria. One thousand subjects of Southern Ijaw ethnic group of Bayelsa State were used in this study (N = 460 females and N = 540 males).

Study design: was in accordance with the Helsinki declaration of 1975, as revised in 1983 on human experimentation convention and human right.

Exclusion Criteria: Subjects who were not from this ethnic group were excluded.

Ethical Considerations: Consent was obtained from individuals after due explanation of the concept and intent of the study.

Screening: Subjects were physically screened for presence or absence of polydactyly. Observations were categorized as presence or absence of polydactyly and into gender. Gender preponderance was assessed by Fisher's exact test (GraphPad InStat Version 2) at $p< 0.05$ significance level. This study did not discriminate between types / sub- types of these morphological traits. Any traits that satisfied Eurocat exclusion criteria (i.e not considered a clinical condition) were included in the study (EUROCAT 2007).

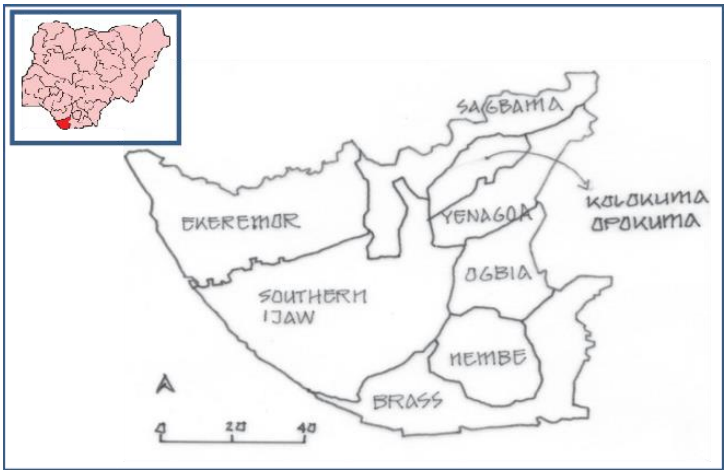

Figure 1: Map showing the location of Southern Ijaw

RESULTS

A total of 1000 subjects comprising of 540 (54%) males and 460 (46%) females were included in the study. A total of eighty-one subjects (7.5%) had polydactyly in our study population. The population and gender prevalence are depicted (Table 1). Polydactyly shows a higher occurrence in males compared to females; however, gender predilection was not evident at $p < 0.05$ level of significance. Table 2 does not exist in the work of Leck & Lancashire (1995) but was developed from their observations and results for ease of comparison.

Table 1. The General Population and Gender Prevalence of Polydactyly in the Southern Ijaw indigene of Bayelsa State, Nigeria.

Traits	Male	Female	Total	% in N	Prev in Male pop (%)	Prev in Female pop (%)	Prev in male /1000	Prev in female /1000	Pop prev/1000
Polydactyly	41	33	74	7.4	7.6	7.2	75.9	71.7	74

N= 1000, male= 540, female= 460. Sex predominance was not evident at < 0.05; (p = 0.39 for polydactyly)

Table 2. Birth prevalence of malformations in different ethnic groups (per 1000 total births)

Anomaly	European	South Asian	Caribbean	British	Irish
Polydactyly	0.95	2.14	9.53	0.99	0.85

(Leck and Lancashire, 1995)

DISCUSSION

This work may attract few criticisms: it could be argued that the methods lead to an underestimation of prevalence by the exclusion of individuals with syndromes and multiply anomalies. It is important to recall the usual medical convention of not registering a minor anomaly if it appears in association with a syndrome or multiple anomalies (Leck & Lancashire 1995; EUROCAT 2007).

Moreover, syndromes and multiple anomalies may present particular classification problems. This present study did not discriminate between the various types or subtypes of traits. It was satisfied with variants that do cause any not functional handicap or physical challenge on our subjects in accordance with the Eurocast exclusion criteria (EUROCAT 2007). Despite these limitations, its findings are legitimate and provided an important biological anthropological index of the study population.

Our shows that the population prevalence of polydactyly was 7.5%; with no gender predilection ($p = 0.39$, Fisher's exact test). It is suggestive from this study that there is a disparity in order of magnitude between birth incidence and population prevalence, as evident from our result (Table 1) and from the study of Leck and Lancashire, 1995 (Table 2). Bakare *et al*. (2009) in their study on 624 neonates in Southwestern Nigeria observed polydactyly in nine subjects, which was similar to that of the Caribbean but not with the Caucasian or Orient (Leck and Lancashire, 1995). However, Ekanem et *al*. (2008) showed that the prevalence of polydactyly was 0.18 per 1000 in Southeast Nigeria; roughly tenfold lower than those of the European, South Asian, British and the Irish (Leck and Lancashire, 1995).

This present study shows that the population prevalence of polydactyly in the Southern Ijaws of Bayelsa State, Nigeria was 74 per 1000 subjects, apparently in contrast with the studies of Leck & Lancashire (1995) and Ekanem *et al*, (2008). However, it somewhat agrees with the study of Bakare *et al*, (2009) in Southwestern Nigeria because Leck & Lancashire (1995) had earlier demonstrated a tenfold prevalence difference between European and Caribbean. This apart, other factors order than human biologic variations may account for the high value recorded in this present study. Environmental factors are known to account for about 15% of congenital anomalies (CAs) and in combination with genetic factors account for 25% of CAs (Leck 1993).

Bayelsa state like most part of the Niger Delta area of Nigeria has suffered decades of environmental degradation from oil spillage (Ikelegbe 2005). Oil exploitation releases dangerous liquid and gaseous by-products that are toxic to the environment (Vrijheid 2002; Ritz *et al.*, 2002; Ekanem *et al.*, 2008). It cannot be assumed that these by-products are entirely inert to the inhabitants of Niger Delta area of Nigeria, on the contrary, they may be partly associated with the high prevalence rate recorded in the present study; a position which Ekanem *et al.* (2008) have previously suggested.

Although it is a common knowledge that the frequency and type of malformations vary according to race, ethnicity, socio-economic status, nutrition, access to medical care, maternal lifestyle and level of education. The emphasis of this work is not only on incidence or prevalence but on the need of looking at polydactyly as human biology morphologic variant and as such, prevalence should be estimated on a general population base, especially as they satisfy Eurocat exclusion criteria (EUROCAT 2007 and 2012).

Literatures abound on birth prevalence / incidence but the reverse is true for the general population prevalence. This may not be unconnected with the apathy of biological anthropologists to investigate these traits because of problems introduced by medical classification: the term anomaly as applied polydactyly and the ambiguity in defining types / subtypes on one hand, and the medical tradition of estimating anomalies by relating it to number of births (live and still) per thousand on the other. Fortunately, this no longer applies to polydactyly. In the past, the emphasis has been on the new born and not the general population. Studies have however shown that polydactyly displays both ethnic and racial variations, which also varies according to the racial mixes of parents (Leck and Lancashire 1995).

There is also genetic evidence for autosomal dominant inheritance of the common types of polydactyly (Wmter *et al.*, 1993). It is expected that the exclusion of these traits from the category of congenital abnormalities has invariably created an allowance for more non-clinically orientated investigators to be interested in polydactyly. Although it seems their exclusion only serve to define the clinical attention it attracts because it is still being emphasized as such in leading text of human embryology (Sadler 2006). Despite these, it seems reasonable to regard these traits as morphologic variant of importance to biological anthropology in defining the relationship between human biology and culture. Otherwise, a lacuna of scientific knowledge would be created.

This work, therefore, has generated an important index of the Southern Ijaws of Bayelsa State, Nigeria in respect to polydactyly and hence closing up an emerging lacuna. It has shown that population prevalence of polydactyly in 2010 was 74/1000. There was no substantiation of gender preponderance in their episodes in the study population.

DISCLOSURE STATEMENT: The authors declare that they have no competing financial interests.

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AUTHORS' CONTRIBUTIONS

All the authors contributed equally to this study