

The Distribution of Curvature of Little Finger (Clinodactyly) among the Idoma People of Benue State, Nigeria

John Nwolim Paul^{1*}, Joy Ochai², Gospel Chimenma Dimkpa³, Anelechi Kenneth Madume⁴, Hebinuchi Amadi¹, Monday Didia¹, Henry Ajulor Amadi-Ikpa¹, Boobondah James Woha⁵, Joy Wilberforce Ekokodje¹, Rosemary Ezekiel⁶, Confidence Waribo Ihua⁷

¹Department of Human Anatomy, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria

²Department of Anatomy, Faculty of Basic Medical Sciences, College of Medicine, Federal University of Health Sciences, Otukpo, Benue State, Nigeria

³Department of Public Health Sciences, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria

⁴Department of Physiotherapy, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria

⁵Department of Medical Biochemistry, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria

⁶Department of Nursing Science, PAMO University of Medical Sciences, Port Harcourt, Rivers State, Nigeria

⁷Department of Physiology, Faculty of Basic Medical Sciences, College of Health Sciences, University of Port Harcourt, Choba, Port Harcourt, Rivers State, Nigeria

DOI: [10.36347/sajb.2023.v11i03.002](https://doi.org/10.36347/sajb.2023.v11i03.002)

| Received: 25.01.2023 | Accepted: 04.03.2023 | Published: 09.03.2023

*Corresponding author: John Nwolim Paul

Department of Human Anatomy, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Rivers State, Nigeria

Abstract

Original Research Article

Background: A bilateral malformation known as Clinodactyly, or curvature of the little finger in the radio-ulnar plane, causes the finger to be stunted and curved, or inclined, towards the ring finger. It is known to be a morphogenetic trait. Reports say that Clinodactyly seems to be passed on by a single autosomal dominant gene. There is paucity of information on curvature of the little finger in the Idoma tribe of Benue State, Nigeria; hence, this study was aimed at determining the distribution of curvature of the little finger in the study population. **Materials and Methods:** The study was descriptive and cross-sectional in design with 401 participants recruited randomly following a multi-staged sampling method. **Results and Discussion:** The most frequent socio-demographic characteristics were age category 33-47yrs with 213(53.1%), male gender with 223(55.6%), Tertiary education with 239(59.6%), Married/Co-habiting 220(54.9%), and Christianity 286(71.3%). The significant socio-demographic characteristic among participants were educational level ($X^2=14.090$, $p=0.003$) and marital status ($X^2=10.901$, $p=0.05$). The proportion of participants with a curved little finger was 18.9%. In the population a large portion of them had straight little finger. **Conclusion(s):** The proportion of participants with a curved little finger was 18.9%. In the population a large portion of them had straight little finger. The study showed that less than a third of the sampled population had a curved little finger and the remaining two-third a straight little finger. The ratio of curved to straight little finger was 1:4.

Keywords: Clinodactyly, Curved, Straight, Distribution, Idoma.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

A bilateral malformation known as clinodactyly, or curvature of the little finger in the radio-ulnar plane, causes the finger to be stunted and curved, or inclined, towards the ring finger [1]. In this instance, the little finger is bent radially in the direction of the fourth finger [1]. Any finger does have some

degree of curvature that is visible; however, the fifth finger clinodactyly has been linked to a number of disorders, including Down syndrome, Klinefelter syndrome, Turner syndrome, Fanconi anemia, and others [2]. Although curvatures of varying degrees are also prevalent in the general population as a standalone trait without any association with a medical condition or

Citation: John Nwolim Paul, Joy Ochai, Gospel Chimenma Dimkpa, Anelechi Kenneth Madume, Hebinuchi Amadi, Monday Didia, Henry Ajulor Amadi-Ikpa, Boobondah James Woha, Joy Wilberforce Ekokodje, Rosemary Ezekiel, Confidence Waribo Ihua. The Distribution of Curvature of Little Finger (Clinodactyly) among the Idoma People of Benue State, Nigeria. Sch Acad J Biosci, 2023 Mar 11(3): 87-91.

syndrome [3, 4]. Reports say that clinodactyly seems to be passed on by a single autosomal dominant gene. When a person is heterozygous for this defective gene, the trait is passed directly through the generations without a generational gap. The degree of curvature in this trait's phenotypic expression can occasionally vary somewhat [2].

Bio-anthropologists are particularly interested in characteristics that are shared by certain tribes or groups of people and may be associated with them. As a result, the population study examines the various tribes and peoples of the world in order to discover physical characteristics about the people.

There is a paucity of information on most anthropological data on the people of Idoma in Benue State, Nigeria. Hence this study was done to survey the distribution of little finger curvature that is not associated with any syndrome (standalone clinodactyly) in this tribe.

There are works in existence on diverse deformities of the fingers, including clinodactyly, by other authors who have extensively studied and reports its distribution, inheritance pattern, and surgical reconstruction several populations [5-13].

MATERIALS AND METHODS

Study Design: The study was descriptive and cross-sectional in design.

Study Area: The study was done on the Idoma tribe of Benue State. Otukpo town is the ancestral headquarter of the Idoma people in Benue State, Nigeria, located in the Middle Belt Region of Nigeria.

Sample Size: 401 participants were recruited for the study.

Sampling technique: The sampling technique for the study was multistage sampling. This was done in two stages: simple random sampling at stage 1; and stratified random sampling at stage 2. At stage 1, a list of all communities in Otukpo LGA was compiled and numbered sequentially, which served as the sampling frame for random sampling. The numbers corresponding to the names were written on small pieces of paper, and the papers were folded to conceal the number. The folded papers were then picked randomly and blindly using a table of random numbers. In each community, the research assistants located the centre of the community and spanned a ballpoint pen, following the

direction of the pen to determine the street or compound to begin the sampling. In the street or compound, the houses were numbered sequentially, and a table of random numbers was used to select the first house to be sampled. At stage 2, consecutive sampling was employed to select every odd-numbered house for sampling until the sample size was achieved.

Eligibility criteria: Participants who are indigenes of Idoma whose parents, grandparents, and great grandparents were Idoma; those who reside in Idoma land were included in the study, while those who had malformations of the feet were excluded from the study.

Data Collection

Data for the study was collected using a self-created, closed-ended questionnaire that was adapted for use based on previous research on similar studies. Section A explored socio-demographic factors such as age, educational level, marital status and religion. Section B examined the curvature of the little finger. The questionnaire was pre-tested among 40 volunteers who share similar characteristics with the study population. Modifications and adjustments were made to the procedure and the study instruments in response to the pre-test.

Data Analysis

The information obtained from the structured questionnaire was entered and analysed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were carried out on socio-demographic data. The frequencies generated were presented using tables and charts. The chi-square test was used to examine the relationship between variables. A p-value of less than 0.05 was considered significant, and 95% confidence intervals were used as measures to determine the strength of the association.

Ethical Approval

Ethical approval was sought from the Research and Ethics committee of the Federal University of Health Sciences, Otukpo, before the commencement of the study. Written permission to conduct the study was obtained from the respective community CDCs and gatekeepers. A consent form was given to all participants, which they signed after reading the information provided about the nature of the study. The content of the consent form was clearly read out to participants who could not read in a language best understood by them. Participants were free to opt out of the study without penalty, and strict confidentiality was assured.

RESULTS

Table 1: Socio-demographic characteristics of participants

| Socio-demographic characteristics | Frequency (n) | Percent (%) |
|-----------------------------------|---------------|-------------|
| Age category | | |
| 18 -32 | 126 | 31.2 |
| 33 -47 | 213 | 53.1 |
| 48 -62 | 59 | 14.7 |
| 63 -77 | 4 | 1.0 |
| Total | 401 | 100.0 |
| Gender | | |
| Male | 223 | 55.6 |
| Female | 178 | 44.4 |
| Total | 401 | 100.0 |
| Education | | |
| No formal education | 81 | 20.2 |
| Primary education | 3 | 0.7 |
| Secondary education | 78 | 19.5 |
| Tertiary education | 239 | 59.6 |
| Total | 401 | 100.0 |
| Marital status | | |
| Single/Never married | 164 | 40.9 |
| Married/Co-habiting | 220 | 54.9 |
| Divorced/separated | 17 | 4.2 |
| Total | 401 | 100.0 |
| Religion | | |
| Christianity | 286 | 71.3 |
| Islam | 73 | 18.2 |
| Traditional | 39 | 9.7 |
| Others | 3 | 0.7 |
| Total | 401 | 100.0 |

The most frequent socio-demographic characteristics were age category 33-47yrs with 213(53.1%), male gender with 223(55.6%), Tertiary

education with 239(59.6%), Married/Co-habiting 220(54.9%), and Christianity 286(71.3%).

Table 2: The distribution of little finger curvature among the Idoma people of Benue State

| Little finger curvature | Frequency | Percent |
|-------------------------|-----------|---------|
| Curved | 76 | 18.9 |
| Straight | 325 | 81.1 |
| Total | 401 | 100.0 |

The proportion of participants with a curved little finger was 18.9%. In the population a large portion of them had straight little finger.

Table 3: Comparison of little finger curvature distribution with socio-demographic characteristics

| Socio-demographic characteristics | Little finger curvature | | | X ² (p-value) |
|-----------------------------------|-------------------------|------------|------------|--------------------------|
| | Curved | Straight | Total | |
| Gender | | | | |
| Male | 44(10.9) | 186(46.3) | 230(57.3) | |
| Female | 32(8.0) | 139(34.7) | 171(42.7) | 1.271(0.530) |
| Total | 76(18.9) | 325(81.1) | 401(100.0) | |
| Age category | | | | |
| 18 -32 | 15(3.7) | 110(27.4) | 125(31.1) | |
| 33 -47 | 30(7.5) | 173 (43.2) | 203(50.7) | 2.853(0.415) |
| 48 -62 | 20(4.9) | 39(9.8) | 59(14.7) | |
| 63 -77 | 11(2.8) | 3(0.7) | 14(3.5) | |
| Total | 76(18.9) | 325(81.1) | 401(100.0) | |

| Socio-demographic characteristics | Little finger curvature | | | X ² (p-value) |
|-----------------------------------|-------------------------|-----------|------------|--------------------------|
| | Curved | Straight | Total | |
| Education | | | | |
| No formal education | 17(4.3) | 64(15.9) | 81(20.2) | |
| Primary education | 2(0.5) | 1(0.2) | 3(2.6) | 14.090(0.003) |
| Secondary education | 22(5.4) | 63(15.8) | 85(21.2) | |
| Tertiary education | 35(8.7) | 197(49.2) | 232(56.0) | |
| Total | 76(18.9) | 325(81.1) | 401(100.0) | |
| Marital status | | | | |
| Single/Never married | 40(9.9) | 127(31.7) | 167(41.6) | |
| Married/Co-habiting | 30(7.5) | 187(46.7) | 217(54.2) | 10.901(0.02) |
| Divorced/separated | 6(1.5) | 11(2.7) | 17(4.2) | |
| Total | 76(18.9) | 325(81.1) | 401(100.0) | |
| Religion | | | | |
| Christianity | 50(12.6) | 219(54.6) | 269(67.2) | |
| Islam | 15(3.8) | 58(14.5) | 73(18.3) | 1.714(0.634) |
| Traditional | 7(1.5) | 37(9.3) | 44(10.8) | |
| Others | 4(1.0) | 11(2.7) | 15(3.7) | |
| Total | 76(18.9) | 325(81.1) | 401(100.0) | |

The significant socio-demographic characteristic among participants was educational level ($X^2=14.090$, $p=0.003$) and marital status ($X^2=10.901$, $p=0.05$).

DISCUSSIONS

Summary of Results

The most frequent socio-demographic characteristics were age category 33-47yrs with 213(53.1%), male gender with 223(55.6%), Tertiary education with 239(59.6%), Married/Co-habiting 220(54.9%), and Christianity 286(71.3%). The significant socio-demographic characteristic among participants was educational level ($X^2=14.090$, $p=0.003$) and marital status ($X^2=10.901$, $p=0.05$). The proportion of participants with a curved little finger was 18.9%. In the population a large portion of them had straight little finger.

Implication of findings

The study showed that less than a third of the sampled population had a curved little finger and the remaining two-third a straight little finger. The ratio of curved to straight little finger was 1:4. The males had a higher distribution of the curved little finger than the females on a ratio of 4:3. The ratio of straight little finger in males to females was shown to be 4:3. Little finger curvature is a morphogenetic trait as such is influenced by the genetic makeup of individuals. The difference in the proportion and ratios that was seen in the result could be attributed to the fact that there were more males recruited into the study than females. The result of the current study agrees with the reports of De Marinis and De Marinis [4], Munir [10], Lee [11], Perrone [12], Marden [13] who had earlier stated that the curved little finger was less prevalent in their study populations. They also stated that the little finger curvature was a morphogenetic trait that follows the Mendelian principle of inheritance [7].

CONCLUSION(S)

The significant socio-demographic characteristic among participants were educational level ($X^2=14.090$, $p=0.003$) and marital status ($X^2=10.901$, $p=0.05$). The proportion of participants with a curved little finger was 18.9%. In the population a large portion of them had straight little finger. The study showed that less than a third of the sampled population had a curved little finger and the remaining two-third a straight little finger. The ratio of curved to straight little finger was 1:4.

REFERENCES

- Murdan, S. (2011). Transverse fingernail curvature in adults: a quantitative evaluation and the influence of gender, age, and hand size and dominance. *International journal of cosmetic science*, 33(6), 509-513.
- Dutta, P., & Dutta, P. C. (1965). The inheritance of the radially curved little finger. *Acta genetica et statistica medica*, 70-76.
- Vickers, D. (1987). Clinodactyly of the little finger: a simple operative technique for reversal of the growth abnormality. *Journal of Hand Surgery*, 12(3), 335-342.
- De Marinis, F., & De Marinis, M. R. (1958). Frequency of clinodactyly in children between the ages of 5 and 12. *Acta geneticae medicae et gemellologiae: twin research*, 4(2), 192-204.
- Liu, F., Zhang, D., & Shen, L. (2015). Study on novel curvature features for 3D fingerprint recognition. *Neurocomputing*, 168, 599-608.
- Adeb, M., Hayashi, D., & Kumar, Y. (2016). Kirner's deformity of the fifth finger: a case report. *BMC Musculoskeletal Disorders*, 17(1), 1-4.

- Ordu, K. S., & Nwosu, N. C. (2015). Little finger curvature: A morphogenetic trait inherited by Mendelian pattern among the Igbo ethnic group of Nigeria. *Discov Genet*, 1(1), 6-11.
- Hefner, R. A. (1941). CROOKED LITTLE FINGERS: (Minor Streblomicrodactyly). *Journal of Heredity*, 32(1), 37-38.
- Onyije, F. M., Oyinbo, C. A., & Waritimi, E. G. (2012). The prevalence and comparison of bent little finger and hitchhiker's thumb in South-South Nigeria. *Eur. J. Appl. Sci*, 4(4), 157-159.
- Munir, S., Sadeeqa, A., Nergis, B., Tariq, N., & Sajjad, N. (2015). Assessment of morphogenetic inherited traits; earlobe attachment, bent little finger and hitchhiker's thumb in Quetta, Pakistan. *world Journal of Zoology*, 10(4), 252-255.
- Lee, M. K., Dahl, Z. T., Anderton, J., Maurer, J. L., Marazita, M. L., Shaffer, J. R., & Weinberg, S. M. (2022). Bent pinkies: Quantifying fifth finger clinodactyly in a sample of US adults. *Plos one*, 17(7), e0271734.
- Perrone, E., Zanolta, T. A., Fock, R. A., Perez, A. B. A., & Brunoni, D. (2017). Determining the frequency of morphological characteristics in a sample of Brazilian children. *Jornal de Pediatria*, 93, 592-600.
- Marden, P. M., Smith, D. W., & McDonald, M. J. (1964). Congenital anomalies in the newborn infant, including minor variations. *Nursing Research*, 13(4), 361.