

Dermatoglyphic patterns of myocardial patients in Southern Nigerian population

ABSTRACT

Introduction: Dermatoglyphics has been well established as a diagnostic aid in a number of diseases having hereditary basis. The aim of this study is to determine if dermatoglyphic patterns can be used to identify myocardial patients in Southern Nigeria. **Materials and Methods:** A total number of 130 patients comprising 85 patients with hypertension (44 males and 41 females) 45 patients with diabetes (21 males and 24 females) were recruited for this study. All patients were selected from the general outpatient departments of the University of Port Harcourt Teaching Hospital and Braithwaite Memorial Specialist Hospital. The parameters studied were the A-B ridge count and ATD and DAT angles on the palms. **Results:** Results revealed that for patients with hypertension, the mean A-B ridge counts, ATD angle, and DAT angle of the left hand in males were 25.92 ± 0.52 , $43.56 \pm 0.81^\circ$, and $63.89 \pm 1.00^\circ$, respectively, while in females, they were 25.12 ± 0.49 , $39.82 \pm 0.91^\circ$, and $61.20 \pm 1.06^\circ$, respectively. In the right hand, the mean A-B ridge count, ATD angle, and DAT angle were 26.39 ± 0.56 , $42.13 \pm 0.96^\circ$, and $62.06 \pm 0.89^\circ$, respectively, in males while the females had 24.29 ± 0.51 , $39.85 \pm 0.62^\circ$, and $64.32 \pm 0.81^\circ$, respectively. The mean A-B ridge count, ATD angle, and DAT angle of the left hand in male diabetics were 26.75 ± 0.76 , $41.81 \pm 1.21^\circ$, and $62.69 \pm 1.15^\circ$, respectively, while in female diabetics, they were 25.43 ± 0.90 , $42.74 \pm 1.27^\circ$, and $61.64 \pm 1.42^\circ$, respectively. There was no significant difference observed in all three parameters. The mean value for A-B ridge count, ATD angle, and DAT angle in the right hand of male diabetics was 26.63 ± 0.64 , $41.88 \pm 1.30^\circ$, and $62.19 \pm 0.89^\circ$, respectively, while in female diabetics, it was 24.71 ± 0.99 , $42.00 \pm 1.13^\circ$, and $60.79 \pm 1.16^\circ$, respectively. There was no significant difference observed in both sexes. **Conclusion:** The results obtained from this study would serve as an important aid in early diagnosis and etiology of myocardial disease.

Key words: Dermatoglyphics, myocardial patients, Southern Nigeria

**Emeka A. Osunwoke,
A. N. E. Nene**

Department of Human Anatomy,
Faculty of Basic Medical Sciences,
University of Port Harcourt, Choba,
Nigeria

Address for correspondence:

Dr. Emeka A. Osunwoke,
Department of Human Anatomy,
Faculty of Basic Medical Sciences,
University of Port Harcourt,
Choba, Nigeria.
E-mail: aeosunwoke@yahoo.com

INTRODUCTION

The study of dermatoglyphics has shown that fingerprints are formed by skin ridges, the distribution of which is unique to each and that the prints present on the palmar and plantar are formed early in the fetal development between 4 and 5 months.^[1] The fingerprint patterns (whorls loop

and arch) are genetically determined and are different for each person.^[2] Further, it is worthy of note that in medicine and genetics, dermatoglyphics is a very useful tool in diagnosing congenital heart disease, leukemia, cancer, rubella embryopathy, schizophrenia, Alzheimer's disease, as well as other forms of mental illness.^[3-5]

Access this article online

Quick Response Code:



Website:

www.bioanthrojournal.org

DOI:

10.4103/2315-7992.204685

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Osunwoke EA, Nene AN. Dermatoglyphic patterns of myocardial patients in Southern Nigerian population. *Ann Bioanthropol* 2016;4:118-20.

Epidermal ridges form well-defined patterns that characterize individuals and they have been found useful in the clinical diagnosis of hereditary diseases. They form early in the fetal development, and they remain unchanged throughout life and hence could be used to indicate gene or chromosomal abnormalities.^[6] Reports are also available on the correlation of dermatoglyphics in diabetes mellitus and idiopathic (primary)-dilated cardiomyopathy.^[7,8] Digital dermatoglyphics may play an important role in identifying women either with or at risk of breast cancer.^[9] Factors affecting early fetal development may increase the risk of psychotic disorder and differential exposure to such early risk factor may contribute to twin discordance for psychotic disorder.^[10] Digital patterns, whorls, and ulnar and radial loops are important features for identification and forensic investigation of ethnic groups.^[11] According to a study conducted by Takashina and Yorifuji^[12] in the Japanese and American subjects, the occurrence of distal triradius in congenital heart diseases was 64% as against 16% in acquired heart disease. In another study of the dermatoglyphic patterns of prostate cancer patients as a useful tool in early diagnosis of the disease, it was discovered that there was an abnormality in A-B and B-C ridge counts which could be a characteristic dermatoglyphic pattern of these patients.^[13]

This study is aimed at determining if dermatoglyphic patterns can be used to identify myocardial patients in Southern Nigeria.

MATERIALS AND METHODS

A total of 130 patients comprising 85 patients with hypertension (44 males and 41 females) and 45 patients with diabetes (21 males and 24 females) from the general outpatient department of the University of Port Harcourt Teaching Hospital and Braithwaite Memorial Specialist Hospital were recruited for this study.

After informed consent was obtained, the palm of the subject was cleaned with a cotton wool soaked in methylated spirit, washed with soap, and then dried with a hand towel. Thereafter, the palmar prints were obtained by placing the entire surface of the palm on the ink pad and then making the prints on a white duplicating paper after applying a little pressure so as to ensure a good palmar print. The palm was then cleaned with cotton soaked in methylated spirit, washed in water, and dried with a hand towel. A magnifying hand lens was used to magnify the ridges of the prints for easy identification. A protractor was used to measure the angle of the palm. After collecting the prints, the following parameters considered were A-B ridge count, ATD angle, and DAT angle.

Data were analyzed using SPSS 19.0 version (IBM). Z-test and analysis of variance were carried out using this software.

RESULTS

The results of this study are presented in Table 1. Table 1 shows the ridge count, ATD angle, and DAT angle of subjects with hypertension and those with diabetes. In their right hand, the mean A-B ridge count, ATD angle, and DAT angle were 26.39, 42.13°, and 62.06°, respectively, in males while the females had 24.29, 39.85°, and 64.32°, respectively. The mean A-B ridge counts, ATD angle, and DAT angle of the left hand in males were 25.92, 43.56°, and 63.89°, respectively, while in females, they were 25.12, 39.82°, and 61.20°, respectively. The mean value for A-B ridge count, ATD angle, and DAT angle in the right hand of male diabetics was 26.63 ± 0.64, 41.88 ± 1.30°, and 62.19 ± 0.89°, respectively, while in female diabetics, it was 24.71 ± 0.99, 42.00 ± 1.13°, and 60.79 ± 1.16°, respectively. There was no significant difference observed in both sexes. The mean A-B ridge count, ATD angle, and DAT angle of the left hand in male diabetics were 26.75 ± 0.76, 41.81 ± 1.21°, and 62.69 ± 1.15°, respectively, while in female diabetics, they were 25.43 ± 0.90, 42.74 ± 1.27°, and 61.64 ± 1.42°, respectively. There was no significant difference observed in all three parameters.

DISCUSSION

Dermatoglyphics has been described as a useful tool in medicine and genetics in diagnosis of congenital, other forms of diseases and establishing and confirming historical relationships between populations.^[3,14]

This study has documented the dermatoglyphic patterns of myocardial patients in the southern part of Nigeria. The A-B ridge count in the right hand of male subjects with hypertension and those with diabetes showed no significant

Table 1: Mean ridge count, ATD angle, and DAT angle of subjects with hypertension and those with diabetes

Parameter	Males		Female	
	Right	Left	Right	Left
Hypertension				
Ridge count	26.39±0.56	25.92±0.52	24.29±0.51	25.12±0.49
ATD angle°	42.13±0.96	43.56±0.81	39.85±0.62	39.82±0.91
DAT angle°	62.06±0.89	63.89±1.00	64.32±0.81	61.20±1.06
Diabetes				
Ridge count	26.63±0.64	26.75±0.76	24.71±0.99	25.43±0.90
ATD angle°	41.88±1.30	41.81±1.21	42.00±1.13	42.74±1.27
DAT angle°	62.19±0.89	62.69±1.15	60.79±1.16	61.64±1.42

difference as observed in this study. The same was observed in the females. This is in concordance with a study by Ziegler *et al.*^[15] on type 1 diabetes patients and Arrieta *et al.*^[16] on autistic children. However, the values obtained in this study were lower than that obtained by Oladipo *et al.*^[13] which was 35.80 and 38.00 in the right and left hands of prostate cancer patients, respectively; Sridevi *et al.*^[17] which was 36.76 and 35.18 in the right and left hands, respectively, of Indian women with breast cancer; and Pallotta *et al.*^[18] on patients with neurofibromatosis. The mean values for ATD angle obtained in this study for both the right and left hands of the males were higher than that obtained for the females. Both hands showed no significant difference. This is in line with the study conducted by some researchers, in which they found an increase in the ATD angle in patients with hypertension and diabetes, juvenile hypertension patients, autistic children, and children suffering from constitutional exogenous adiposity^[16,19-21] but not in agreement with the work by Oladipo *et al.*,^[22] in which they obtained lower values 38.87 ± 1.30 and 39.13 ± 1.70 in the right and left palms of male polydactyl patients and 47.20 ± 4.13 and 47.80 ± 3.80 in female polydactyl patients, respectively, on patients with multiple sclerosis and patients with bruxism.^[23,24] The DAT angles obtained in this study were higher than that obtained by Bala *et al.*^[19] and in line with that obtained for mentally retarded subjects indicating that the patients had an increased DAT angle.^[25]

CONCLUSION

The study of dermatoglyphic patterns is a useful tool in early diagnosis of certain illness. It is cost-effective and can be used in the prevention of complications in medical conditions such as myocardial diseases.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Cummins H, Midlo C. Finger Prints, Palms and Soles: An Introduction to Dermatoglyphics. Philadelphia: The Blakiston Company; 1943. p. 11-5.
- Singh I, Pal GP. Human Embryology. 8th ed. MacMillan India Pvt, Ltd New Delhi;1976. p. 98-9.
- Schaumann B, Alter M. Dermatoglyphics in Medical Disorders. Springer Verlag; 1976. p. 1-7.
- Oladipo GS, Gwunireama IU, Ighegbo J. Dermatoglyphic pattern of schizophrenics in South-South Nigerian population. J Biomed Afr 2005;8:112-4.
- Dhall U, Rathee SK, Dhall A. Utility of fingerprints in myocardial infarction patients. J Anat Soc India 2000;49:153-4.
- Igbigbi PS, Msamati BC, Ngombi TM. Plantar and digital

- dermatoglyphic patterns in Malawian patients with diabetes, hypertension and diabetes with hypertension. East Afr Med J 2001;9:1-4.
- Oladipo GS, Ogunnowo BM. Dermatoglyphic pattern in diabetes mellitus in South-Eastern Nigerian population. Afr J Appl Zool Environ Biol 2004;6:6-8.
- Oladipo GS, Olabiyi O, Oremosu AA, Norohnna CC, Okanlawo AO, Paul CW. Sickle-cell anaemia in Nigeria: Dermatoglyphic analysis of 90 cases. Afr J Biochem 2007;1:54-9.
- Sakineh A, Nahid E, Nasrin D, Vaez-Zadeh F. Study of dermatoglyphic patterns of hands in women with breast cancer. Pak J Med Sci 2006;22:18-22.
- Rosa A, Fañanas L, Bracha HS, Torrey EF, van Os J. Congenital dermatoglyphic malformations and psychosis: A twin study. Am J Psychiatry 2000;157:1511-3.
- Osunwoke EA, Ordu KS, Hart JS, Esomonu C, Tamunokuro FB. A study on the dermatoglyphic patterns of Okirika and Ikwerre ethnic groups of Nigeria. Sci Afr 2008;7:143-7.
- Takashina T, Yorifuji S. Palmar dermatoglyphics in heart disease. Differential studies in Japanese and American populations with congenital and acquired heart diseases. JAMA 1966;197:689-92.
- Oladipo GS, Paul CW, Bob-Manuel IF, Fawehinmi HB, Edibamode EI. Study of digital and palmar dermatoglyphic patterns of Nigerian women with malignant mammary neoplasm. J Appl Biosci 2009;15:829-34.
- Penrose LS. Fingerprint, palm and chromosomes. Nature 1963;197:933-8.
- Ziegler AG, Mathies R, Ziegelmayr G, Baumgartl HJ, Rodewald A, Chopra V, *et al.* Dermatoglyphics in type 1 diabetes mellitus. Diabet Med 1993;10:720-4.
- Arrieta MI, Martinez B, Criado B, Simón A, Salazar L, Lostao CM. Dermatoglyphic analysis of autistic basque children. Am J Med Genet 1990;35:1-9.
- Sridevi NS, Delphine Silvia CR, Kulkarni R, Seshagiri C. Palmar dermatoglyphics in carcinoma breast of Indian women. Rom J Morphol Embryol 2010;51:547-50.
- Pallotta R, Carlone G, Petrucci A, Chiarelli F. Dermatoglyphics in von Recklinghausen neurofibromatosis. Am J Med Genet 1989;34:233-6.
- Bala A, Deswal A, Sarmah PC, Khandalwal B, Tamang BK. Palmar dermatoglyphics patterns in diabetes mellitus and diabetes with hypertension patients in Gangtok region. Int J Adv Res 2015;4:1117-25.
- Palyzová D, Kuklík M, Beránková M, Schaumann B. Dermatoglyphics in juvenile hypertension. Anthropol Anz 1991;49:361-6.
- Kaladze NN, Chebanova NA, Doroshenko LK. Dermatoglyphics in children with constitutional exogenous obesity. Probl Endokrinol (Mosk) 1992;38:23-4.
- Oladipo GS, Okoh PD, Agi C, Dike EU, Orluwene CG. A comparative study of dermatoglyphic patterns of polydactyl patients and normal Nigerian individuals. Int J Pharm Appl 2013;4:38-42.
- Supe S, Milicic J, Pavicevic R. Analysis of the quantitative dermatoglyphics of the digito-palmar complex in patients with multiple sclerosis. Coll Antropol 1997;21:319-25.
- Polat MH, Azak A, Evlioglu G, Malkondu OK, Atasu M. The relation of bruxism and dermatoglyphics. J Clin Pediatr Dent 2000;24:191-4.
- Osunwoke EA, Omogiate PO. A study on palmar dermatoglyphics of mentally retarded adults in South-Southern Nigeria. J Dis Glob Health 2015;3:62-5.