Full Length Research

Gender variation in finger prints of Esan ethnic group of Edo state, Nigeria

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This study was carried out to find out the possibility of gender variation in the pattern of palm and finger prints (Dermatoglyphics) of 192 adults (100 males and 92 females) of Esan origin who, at the time of this study, were residing in Esan-land -the central senatorial district of Edo state Nigeria. The subjects were selected via a multi-stage sampling technique. Fingerprint determination was performed using the Indian ink method, while the palms were observed for the angles connecting the triradii at the roots of the fingers (a-index finger, b-middle finger, c-ring finger d-small finger and t-the most proximal triradii in the palm) taken as atd, tad and tda angles. The data collected were statistically analyzed using the Statistical Package for the Social Science (SPSS), student’s t-test, chi square test and ANOVA. Results showed that the loop pattern had the highest frequency (61.7%) followed by whorl (24.9%), arch (12.8%) and double whorl (0.6%). The mean atd angles were 43.49 for males and 44.02 for females; tad angles were 75.11 for males and 74.71 % for females; and tda were 61.22% for males and 61.35% females. The result revealed that the patterns of finger prints distribution were different for both sexes for example females had more arches on the both hands (57.1% and 53.0%) whereas males have more loops on both hands; atd angles were higher in females on both hands, Loops and whorls which were found to be significantly higher in the hands of males.

Key words: Esan people, Dermatoglyphics, palm and finger prints.

INTRODUCTION

Dermatoglyphic patterns are genetically determined, ie they are inheritable (Abue et al., 2012,2013). All configurations of palmer and finger prints are laid down permanently from the 3rd month of intra-uterine life and they remain unchanged throughout life (Sharma et al., 2012, Keith et. al, 2012). It is believed that they follow a polygenic pattern of inheritance (Adebisi 2008, 2009).

The science of dermatoglyphics involves the study of epidermal ridges present on the surfaces of palms, fingers, sole and toes. It has found usefulness in establishing sexual differences (Osunwoke et al., 2008; Igbigbi et al., 1999, 2002).

The following dermatoglyphic features in Figure 1 and their modifications are found in the palms and fingers. The finger print types include: Arches, Loops, Whorls and double Whorls. Starting from the thumb, the fingers are number one to five and starting from the root of the index finger, the triradii are labeled A to D with the most proximal triradius on the palm taken as t. (Figure 1). The aim was to determine the dermatoglyphic variations in the dermatoglyphic patterns among people of Esan ethnic group as it relates to gender. Studies of palm and finger prints of Zibabweans, Urhobos and Ibibios show gender differences (Igbigbi et. al, 1999, 2002).

MATERIALS AND METHODS

A total of 192 subjects (100 males and 92 females) whose both parents are of Esan ethnic group in Nigeria
and residing in Esan during the survey were recruited for the study.

The Indian ink method as described by Midlo and Cummins was used to collect digital prints on the palms and fingers of the subjects. The prints were analysed using a hand lens, ruler, pencil and protractor. Frequencies were expressed in percentages.

Location and duration of study: The study was conducted in Esan land in the Central senatorial district of Edo State, Nigeria. Esan is located at Longitude 60°5′ and Latitude 60° 5′. It has boundaries on the North West with Owan and Etsako on the North-East; on the South-West with Orhiomwon and Ika, while on the South and South-East with Aniocha and Oshimili. Data collection was over a period of six months, between July and December, 2013.

Study population/ Sampling technique: A total of 192 subjects (100 males and 92 females) who are genuinely of Esan ethnic group in Nigeria and residing in Esan during the survey were recruited for the study through a multi-stage random sampling technique. Parentage and Domiciliation were used as inclusion criteria viz: Adult male and female of Esan descent and who reside in Esanland at the period of the study both parents having to be of Esan descent.

Consent was also a criterion as intending subjects gave consent to the study by signing (or as the case may thumb-printed). Parentage was used as the only exclusion criterion, as subjects with either or both parents not being Esan origin were excluded.

Ethical consideration: Ethical certificate for the study was sought and obtained from Research and Ethics Committee of the College of Medical Sciences, University of Benin, Benin City.

Dermatoglyphic pattern determination: The Indian ink method by Midlo and Cummins (Osunwoke et al., 2008; Manoj et al., 2012; Abue et al., 2013) was used to collect digital prints on the palms and fingers of the subjects. The prints were analyzed using a hand lens, ruler, pencil and protractor. Frequencies were expressed in percentages.

Data analysis

The data collected were statistically analyzed using the Statistical Package for the Social Science (SPSS), student’s t-test, chi square test and ANOVA.

RESULTS AND DISCUSSION

The frequency of Loops was found to be highest, followed by Whorls and Arches; the least being Double Whorls (Figure 2). Results showed that the loop pattern had the highest frequency (61.7%) followed by whorl (24.9%), arch (12.8%) and double whorl (0.6%). The mean atd angles were 43.49 for males and 44.02 for
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Figure 2. Dermatoglyphic patterns on fingers (Trimpe, 2006).

Table 1. Relationship between age, right and left TDA, ATD and TDA angles versus sex of respondents.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Male N = 100</th>
<th>Female N = 92</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Mean ± SD</td>
<td>36.22 ± 17.21</td>
<td>35.08 ± 16.74</td>
<td>t = 0.466</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.642</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right tda Mean ± SD</td>
<td>61.22 ± 3.74</td>
<td>61.35 ± 4.13</td>
<td>t = - 0.234</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.815</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right atd Mean ± SD</td>
<td>43.49 ± 2.94</td>
<td>44.02 ± 3.36</td>
<td>t = - 1.170</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right tad Mean ± SD</td>
<td>75.11 ± 4.03</td>
<td>74.71 ± 4.55</td>
<td>t = 0.644</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.521</td>
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<td></td>
</tr>
<tr>
<td>Left tda Mean ± SD</td>
<td>76.74 ± 4.08</td>
<td>75.46 ± 4.61</td>
<td>t = 2.046</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.042</td>
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<td></td>
</tr>
<tr>
<td>Left atd Mean ± SD</td>
<td>42.83 ± 3.11</td>
<td>43.54 ± 3.79</td>
<td>t = - 1.432</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.154</td>
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</tr>
<tr>
<td>Left tad Mean ± SD</td>
<td>60.23 ± 3.68</td>
<td>61.15 ± 5.06</td>
<td>t = - 1.452</td>
</tr>
<tr>
<td></td>
<td>df = 190 p = 0.148</td>
<td></td>
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</tr>
</tbody>
</table>

females; *tad* angles were 75.11 for males and 74.71 % for females; and *tda* were 61.22% for males and 61.35% females (Table 1). The result revealed that the patterns of finger prints distribution were different for both sexes for
example females had more arches on the both hands (57.1% and 53.0%) (Table 2) whereas males have more loops on both hands; adt angles were higher in females on both hands, Loops and whorls which were found to be significantly higher in the hands of males. 

Also, comparing both hands combined, the distribution pattern of fingerprints for both sexes is statistically significant with chi-square value of 12.0 and p =0.007 (Table 3).

### Conclusion

Loops and whorls which were found to be higher in the hands of males is said to be statistically significant with a chi square value of 12.0 at p=0.007. It therefore means that when a whorl and a loop are found on any hand for the Esan person, there is likelihood other than chance that he is a male. The same goes for the presence of an arch depicting feminism. So, the difference is not hand specific as it relates to sex but gender related. The results show that adt angles are higher in females. This finding is in keeping with findings in Ijaw and Ikwerre's of southern Nigeria (Igbigbi et al., 2000). Loop has the highest occurrences and are found to be highest in the right hand of males, this is in keeping with findings in Ijaw and Ikwerre's of southern Nigeria (Igbigbi et al., 2000).

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### REFERENCES


Ekerette P.E. (2004). Digital dermatoglyphic patterns of
Annang Ethnic Group in Akwa Ibom State. *J. Free Patterns*, 1: 5-9
Esan People Progressive Union, Esan People Veneto, Italy, [http://www.esanveneto.com/esanhistory.html](http://www.esanveneto.com/esanhistory.html), January 18, 2015, by 2.35 pm