A dermatoglyphic study of congenital deaf and mute subjects was done to determine if there is a characteristic dermatoglyphic pattern associated with them. One hundred and fifty (150) congenital deaf and mute subjects comprising of eighty (80) males and seventy (70) females between the ages of 6-25 years was carried out. The parameters studied include; the digital patterns, digital counts, A-B ridge counts (which is done by counting the ridges found at the intersect between point A; the base of the index finger to point B; the base of the middle finger), ATD (angle made by connecting the ‘a’, ‘t’ and ‘d’ triradii points on the palm and DAT angles (angle made by joining the ‘d’, ‘a’ and ‘t’ triradii points on the palm). In the digital patterns that were analyzed, ulnar loops had the highest frequency followed by whorls, arches and the least was the radial loops. The percentage frequency distribution of the digital pattern for the ulnar loop in males was 48.68 and 45.78 and females was 55.07 and 66.18 for right and left hands respectively, whorls for males was 31.58 and 38.55 and females was 24.64 and 22.06 for right and left hands respectively, arches for males was 17.11 and 15.66 and females was 15.94 and 11.76 respectively and radial loop for males was 2.63 and females 4.35 for right and left hands respectively. There was no significant difference (P>0.05) between the male and female subjects in their digital patterns, digital counts and A-B ridge count. The mean ATD angle for males was 44.51 and 43.17 for right and left hands respectively and for females 45.87 and 46.22 right and left hands respectively. The ATD angle showed no significant difference (P>0.05) in the right hands but showed a significant difference (P<0.05) in the left hand. The mean DAT angle for the males was 60.97 and 60.61 right and left respectively and for females 58.86 and 56.26 for right and left hands respectively. For the DAT angle, there were significant differences (p<0.05) for both male and female subjects.

Keywords: Dermatoglyphics, Congenital deaf and mute, South-South Nigeria.
lems have left their marks on the brain and hands. Examples of such associations are the significant increase in palmer single flexion creases (simian line) and Sydney creases (distal transverse crease that completely crosses the palm) and mental retardation in Down’s syndrome and some missing interphalangeal flexion creases in mentally retarded individuals [6]. Hirsch presented a report on the research he had performed in relationship to mental retardation, congenital heart defects, diabetes mellitus, several child psychiatric groups, retarded growth and a number of syndromes where he found clear relationships [7]. Also, autosomal trisomies, trisomy 21 (Down’s syndrome), trisomy 13 and 18 and trisomy 8 (mosaicism) have long been subjected to studies in relationship to dermatoglyphic patterns [8]. Dermatoglyphic pattern has positive correlation in some disease conditions most especially the genetically related. Such conditions include those associated with organic mental retardation. It is also hypothesized that dermatoglyphics may aid in the diagnosis of such conditions. Also, genetic linkage and determination of dermatoglyphics has been described as one of the best diagnostic tools in genetic disorders [9]. Development of dermal ridges and congenital deafness seems to be interlinked as they develop at about the same time [10]. Also, the development of the inner ear (5 weeks to 12 weeks) exactly coincides with the development of dermal patterns [11]. Hearing impairment can have a major impact on the social and emotional development, behavior and academic achievement. The earlier the impairment is identified the better the prognosis. Data from the Colorado new born screening program suggests that if congenital deafness is identified and treated by the age of 6 months, they would develop at the same level of language as their age matched peers who are not deaf [12].

This study is aimed at determining if there is a characteristic dermatoglyphic pattern associated with the congenital deaf and mute in our environment.

2. Materials and Methods

A total number of 150 congenital deaf and mute subjects from special school for handicapped located at 69 creek road Borokiri, in Rivers state, Nigeria were recruited for this study. They comprised of 80 males and 70 females with age ranging from 6-25 years. To obtain the palmar print of the subjects, a cotton wool was soaked in the endorsing ink which was spread on the entire surface of the palm. The hand was extended at the wrist and the fingers fully abducted. The subject then made impressions of his/her palm by placing the palm on the duplicating paper starting with the proximal part of the hand and lowering it until the digits came in contact with the paper. A little pressure was applied to ensure good palmar print. The ink was removed from the palm using soap and water. A magnifying hand lens was used to magnify the ridges of the prints for easy identification of the different finger print patterns. A protractor was then used to measure the angles on the palm. The following parameters were considered after collecting the prints; Digital patterns, digital counts, A-B ridge count, (which is done by counting the ridges found at the intersect between point A; the base of the index finger to point B; the base of the middle finger), ATD (angle made by connecting the ‘a’, ‘t’ and ‘d’ triradii points on the palm and DAT angles (angle made by joining the ‘d’, ‘a’ and ‘t’ triradii points on the palm). Data analysis was done using Z- Test and Analysis of Variance (ANOVA).
3. Results

The results of this study are presented in the tables below: Table 1: Total percentage (%) frequency distribution of the digital ridge pattern of both hands of male and female congenital deaf and mute subjects. The percentage frequency distribution was obtained by dividing the total digital ridge patterns by the total sample size and multiplying it by 100. Table 2: Summary of mean, standard deviation (S.D), standard error (S.E) and the P-values of the a-b ridge count, ATD and DAT angles of the both hands of male and female congenital deaf and mute subjects.

The results showed that in the digital patterns that were analyzed, ulnar loops had the highest frequency followed by whorls, arches and the least was the radial loops. The percentage frequency distribution of the digital pattern for the ulnar loop in males was 48.68 and 45.78 and females were 55.07 and 66.18 for right and left hands respectively.

Whorls for males were 31.58 and 38.55 and females were 24.64 and 22.06 for right and left hands respectively. Arches for males were 17.11 and 15.66 and females were 15.94 and 11.76 respectively. Radial loop for males was 2.63 and females 4.35 for right and left hands respectively.

There was no significant difference (p>0.05) between the male and female subjects in their digital patterns, digital counts and A-B ridge count. The mean ATD angles for males were 44.51 and 43.17 for right and left hands respectively and for females 45.87 and 46.22 for right and left hands respectively.

The ATD angle showed no significant difference (p>0.05) in the right hands but showed a significant difference (p<0.05) in the left hand. The mean DAT angle for the males was 60.97 and 60.61 for right and left hands respectively and for females 58.86 and 56.26 for right and left hands respectively.

For the DAT angle, there were significant differences (p<0.05) for both the male and female subjects.

Pattern Type Male/Female Subjects n = 150

<table>
<thead>
<tr>
<th>Pattern Type</th>
<th>Male Right</th>
<th>Female Right</th>
<th>Male Left</th>
<th>Female Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radial Loop</td>
<td>2.63</td>
<td>4.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ulnar Loop</td>
<td>48.68</td>
<td>55.07</td>
<td>45.78</td>
<td>66.18</td>
</tr>
<tr>
<td>Whorl</td>
<td>31.58</td>
<td>24.64</td>
<td>38.55</td>
<td>22.06</td>
</tr>
<tr>
<td>Arch</td>
<td>17.11</td>
<td>15.94</td>
<td>15.66</td>
<td>11.76</td>
</tr>
</tbody>
</table>

4. Discussion

The result of this study has shown that ulnar loops have the highest frequency followed by the whorls, arches and the radial loops respectively. This contradicts the work of Alter and Schulenburg where the frequency of whorls was more in the deaf cases of both sexes. A test of significance for the digital pat-
tern shows no statistical significant difference between the males and females [13]. This is in agreement with the works of Dar et al and Alma et al in which there was no statistically significant difference in the fingertip patterns in both sexes [14,15]. It is also in agreement with the work of Cummins and Boroffice in which they indicated that ulnar loops had the highest frequency of occurrence followed by whorls, arches and radial loops in normal subjects [16,17]. Arches do not have any triradius that is why they do not have digital ridge counts in table 1.

The digital counts and the A-B ridge count also shows no statistical significant difference (P>0.05) between the males and females. For the left hand, the ATD angle shows a statistically significant difference (P<0.05) while the right hand shows no statistically significant difference (P>0.05) between the males and females. It was observed that there was a significant difference in the DAT angles of male and female subjects.

5. Conclusion

This study has given an insight into the digital and palmer print patterns predominant in congenital deaf and mute in south- south Nigeria. It could be of immense importance to forensic scientists, anthropologists and clinicians in respect to genetics in the identification of these vulnerable individuals.

Reference


[3] Drtbalu, 2008, Drtbalu’s Important Topics in Otolaryngology, 23 © EMIS.


