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A Study of Fingerprints in Relation to Gender and Blood Group ABO Among Students of Madonna University Elele Campus, Rivers State.

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ABSTRACT

Dermatoglyphics is a term used to describe the epidermal ridge configuration found on the skin surfaces of the digits, palms, toes and soles of the feet. Prints of these ridge patterns are important for identification of an individual's true identity. The present study evaluates the relationship between palmar dermatoglyphics patterns in blood group ABO among students in Madonna university Elele campus, Rivers state. A total number of 200 human subjects, 100 males and 100 females with an age range of 18-25 years were included in this study. Dermatoglyphics of the digital and palmar areas were determined using a classical scanner type, Hp G3110 Scanjet Scanner (9000x4800 dpi resolution). Before printing electric power was switched on so as to power the laptop and the scanner, the subject's data were taken on a plain paper; these include tag number which replaces the subject's name (example TGM for the male students, TGF for the female students), gender and age. The data obtained was analyzed statistically and the percentage frequency was used. This study reveals that most of the Subjects belonged to O blood group (59%) followed by blood group A (20%), B (17.5%) and AB (3.5%). The result of this study revealed association between dermatoglyphic, blood group and sex.

Keywords: Dermatoglyphics, blood group, finger prints, gender, variation

INTRODUCTION

Dermatoglyphics is a term used to describe the epidermal ridge configuration found on the skin surfaces of the digits, palms, toes and soles of the feet. According to Dhankar⁴, the field of dermatoglyphics is geared towards understanding the process involved in the formation of the ridges, and the concentration of the ridges in any given fingerprint.

Kumari *et al.*,⁵ affirmed that the development process of the brain is relative to the development of fingerprints. The density and abundance of the ridges on any given fingerprint thus increases with age as the embryonic mass increases. The research further points out those different fingers in an individual have a unique pattern, and represent different competencies in the individual. This claim has been supported by dermatoglyphics studies which reflect an 85% accuracy in projecting personality traits⁵.

Education is a fundamental tool in personality development and in unearthing the potential a person has. Dermatoglyphics has been integrated into educational frameworks where it has developed into a key variant in analyzing multiple intelligences in children. Its strength in education is also seen in its strategic application to identify and develop talents⁷.

Cummins² is universally acknowledged as the 'Father of Dermatoglyphics'. He studied all aspect of fingerprints analysis ranging from anthropology to genetics, from embryology to the study of congenital malformation of the hands and digits.

Dermatoglyphics is like a map that leads one to understand his own potential and talents. Everyone inherits innate intelligence from their parents. And everybody genetic parents, and has the innate intelligence from their parents. If one's intelligence gets no opportunity to be inspired and further developed, there is no way for one to develop a full range of intelligence of memory, understanding, reasoning, analysis, integration, and application. By analyzing dermatoglyphy, we can accurately understand the distribution and amount of cells in the left and right brain of the cell, and predict where the potential lies.

Fingerprints have three basic pattern described with respect to their physical characteristics. In the 1967 symposium publication in London, the basic pattern according to the Henry system of fingerprint classification. They are as follows:-

1. The Whorl
2. The Arch
3. The Loop

This was published in National Foundation for the Marc of Dines and is accepted worldwide. The fingerprint pattern consists of the following:

- i. THE CORE: This is the centre of the pattern
- ii. THE LINES: This is the heavy dark lines outlining the pattern.
- iii. TRIRADIUS: This is delta-shaped and is present wherever three ridges system meet at a localized region.

Blood group systems are series of antigens exhibiting similar serological and physiological characteristics, and inherited according to a specific pattern. The most well-known and medically important blood types are in the ABO group. ABO antigens are expressed on RBCs, platelets, and endothelial cells and are present in body fluids. ABO testing is performed in order to prevent an adverse transfusion reaction that could be caused by ABO incompatibility between the patient and a blood donor.



Figure 1: HP Scan-jet G3110

To identify and classify Dermatoglyphics for taking Digital-Palmar Complex (DPC) prints, the digital scanning method was used. Dermatoglyphics of the digital and palmar areas were determined using a classical scanner type, Hp G3110 Scan-jet Scanner (9000x4800 dpi resolution).

The subject's data were taken on a plain paper; these include tag number which replaces the subject's name

Since there have been some works done on dermatoglyphics in other countries and population, there is need to study the variations in palmar dermatoglyphics amongst males and females in Madonna University Elele campus, Rivers state.

MATERIALS AND METHODS

200 subjects were used for the study (100 males and 100 female students of Madonna University Elele campus, Rivers state Nigeria). A clearance was gotten from the institutional ethics committee as well as the consent of the study subjects before taking the readings.

All subjects were healthy with known blood groups and their age ranged from 17 to 22 years. Subjects with permanent scars on their fingers and with hand deformities due to injury were excluded from the studies.

(example TGM for the male students, TGF for the female students), gender and age.

- The finger and palms were thoroughly washed with water and soap in a bowl and dried with towel to remove dirt.
- After that, the subjects were asked to place their palm including the fingers on the scanner and the operator scanned it to the Laptop and saved.

- Also the thumb was scanned again separately from the other fingers and palm for clarity.
- Crop the picture of the palm, after that adjust the color to Grayscale.
- Then, increase the effects through options on the screen to high and Extreme, which u invert gray in order to get a clearer view of the Ridges
- when counting.
- It is then reduced from 100% to 10%, then re-scanned to finish.
- The scan prints were saved in a folder and named appropriately using the tag number that can help in the easy identification of the subjects.



Figure2: Scanned Palm

Qualitative-Quantitative analysis of the digital DPC (Digital-Palmar-Complex) area and quantitative analysis of the palmar DPC area were used to make a choice of variables. At digital DPC part, the following parameters were examined;

- Arch, Loop and Whorl pattern of finger prints.

Inclusion Criteria:

- Subjects without scar
- Subjects with known Blood group

Exclusion Criteria: Subjects with permanent scars on their fingers and with hand deformities due to injury were excluded from the studies both ABO blood group system.

Limitation of the Study: Most students bluntly refused to give out their fingerprints even after series of explanation. Inadequate power supply due to inability of the scanner to work without light.

Precaution: When the palm is being scanned, the subject is being told to place it well most especially the thumb to get a cleared pictures of the fingerprints for easy identification.

RESULT

The data collected were statistically analyzed by descriptive analysis using the Statistical Package for the Social Science (SPSS 20).

Table 1(a): Percentage frequency distribution of Subjects according to blood groups and gender

Blood Group	Male (N=100)	Female (N=100)	Total (200)
A+	18(18%)	20(20%)	38(19%)
A-	0(0%)	2(2%)	2(1%)
B+	18(18%)	14(14%)	32(16%)
B-	1(1%)	2(2%)	3(1.5%)
AB+	2(2%)	5(5%)	7(3.5%)
AB-	0(0%)	0(0%)	0(0%)
O+	57(57%)	55(55%)	112(56%)
O-	4(4%)	2(2%)	6(3%)
Total	100(100%)	100(100%)	200(100%)

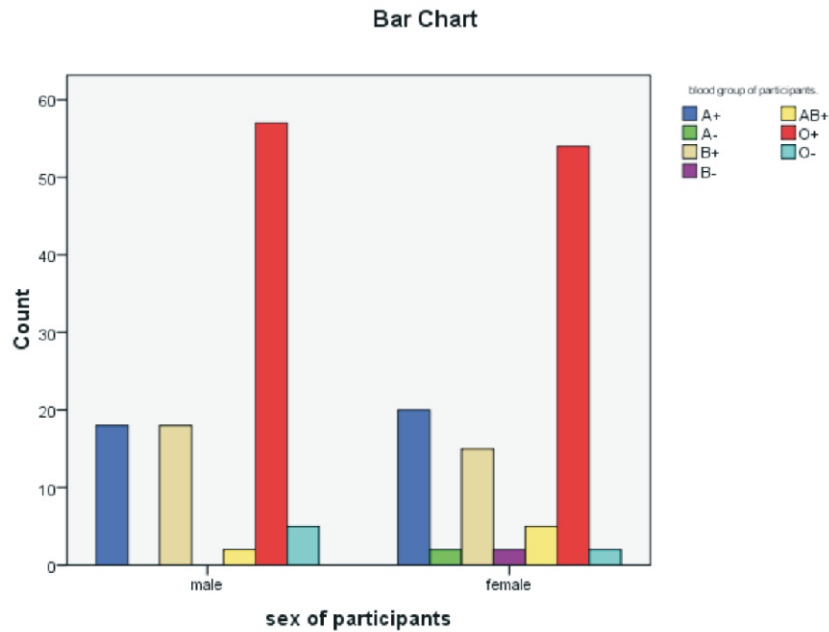


Figure 3: Graph showing the frequency distribution of subjects according to blood groups and gender.

Table 1(b): Percentage frequency distribution according to Rh factor of blood group.

Blood Group	Rh +ve	Rh -ve
A	38(20.10%)	2(18.18%)
B	32(16.93%)	3(27.27%)
AB	7(3.70%)	0(0%)
O	112(59.25%)	6(54.55%)
Total	189 (94.5%)	11(5.5%)

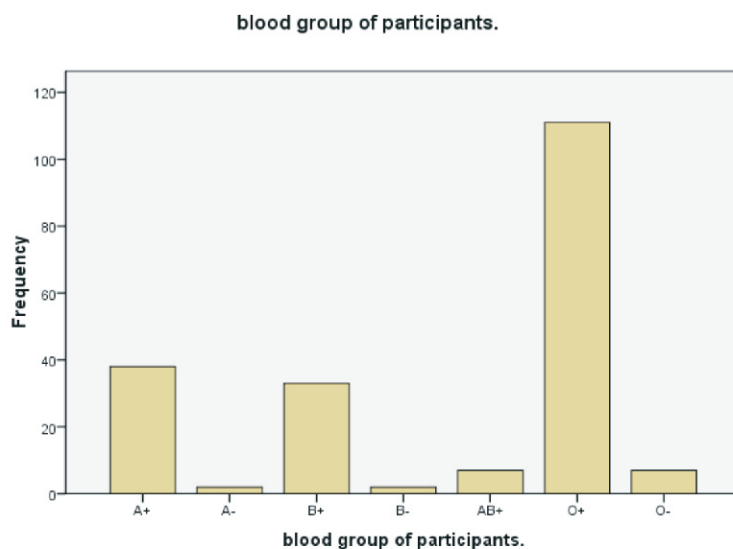


Figure 3(b): Graph showing The Percentage Frequency Distribution according to Rh factor of blood group.

Table 2: The percentage Frequency Distribution among Subjects and Blood group

Blood group	Frequency	Percentage
A	40	20%
B	35	17.5%
AB	7	3.5%
O	118	59%
Total	200	100%

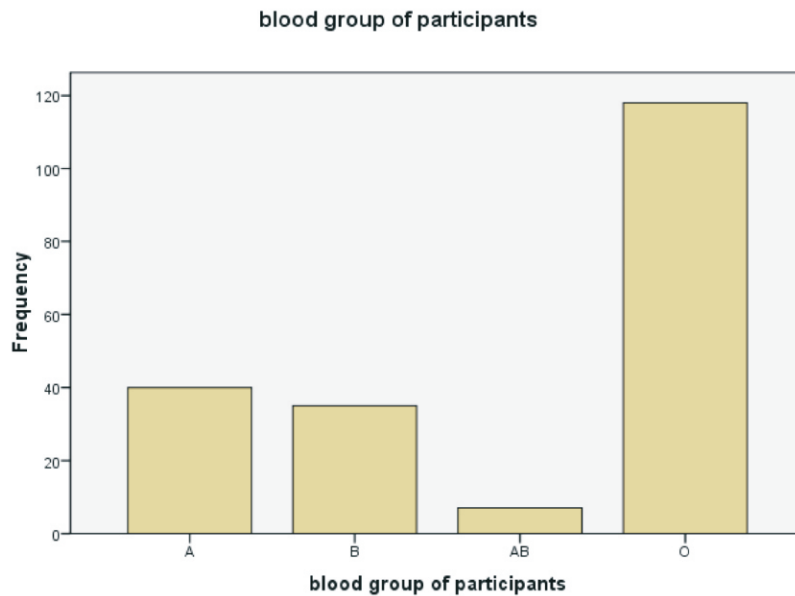


Figure 4: Graph showing the percentage Frequency Distribution among Subjects and Blood group

DISCUSSION

Dermal ridge differentiation are genetically determined and influenced by environmental force, the process being completed by the sixth prenatal month. This study investigated a study of dermatoglyphics in relation to Blood group and Gender in Madonna University Elele Campus, Rivers State.

Man *et al.*,⁶ revealed the correlation between dermatoglyphics and ABO and Rh blood groups. The most common fingerprint patterns is the Loops (ulnar) and least common were the Arches. Blood group positive were most common blood group and AB negative were the rarest group. Most of the female belong to blood group B and most of the males belong to blood group A.

Arches were the highest in blood group O and the difference was statistically significance with blood group B. Whorls were highest in blood group AB and the difference was statistically significance with A and O blood group. Ulnar Loops and Radial Loops were higher in blood group A but no statistically significant with other blood groups. Arches were higher in Rh negative persons but no statistically significant.

In this present study, the Arch pattern had the highest

percentage in O blood group and the difference was statistically significance with blood group AB.

Ekanem *et al.*,¹ reported that the result showed that majority of the subjects belonged to blood group O were mostly associated with the Loop pattern while AB had the least frequency in all the fingerprints patterns. Males had the highest number with Loops and whorls while females had the highest number of arches. In this study, it was concluded that there was an association between distribution of fingerprint patterns, blood groups and gender.

It has been reported that majority of subjects belongs to Rh-positive and O blood group. Loops are the frequently and arches are uncommon fingerprint. Loops were highest in B blood group and lowest in AB blood group. Whorls are highest in A and lowest in B blood group. Arches were highest in AB and lowest in B. Loops higher in female and lowest in male, whorls highest in male and lowest in female and arches highest in male and lowest in female. Loops were highest in Rh-positive and lowest in Rh-negative. Whorls are highest in Rh-negative and lowest in Rh-positive. Arches were highest in Rh-positive and lowest in Rh-negative.

In this present study, the percentage of Loops were higher in females and lower in male, whorls had the highest frequency in male and lowest in female and Arches were higher in male and lower in female, a finding similar to the report of³.

CONCLUSION

The result of this study revealed association between dermatoglyphic, blood group and sex.

The Loop pattern of the fingerprint has the highest Frequency, followed by the Whorl pattern and then the Arch pattern which has the least Frequency in both right and left hand of the Male and Female Subjects.

Also in this study, Loop pattern had the highest frequency in blood group 'AB' and there is significance difference with blood group B and O.

Whorl pattern were higher in blood group 'B' and there is significant difference with blood group A and O.

RECOMMENDATION

Since there has been no much report for the dermatoglyphics in relation to gender and blood group in Nigeria, therefore more work on dermatoglyphics in relation to gender and blood group in a larger population of Nigeria is recommended. This, if done, may confirm the authenticity of this work and may be accepted as a supplementary tool in medical checking of Blood group.

Hence, this method of Examination stands at a merit of time and safety since it is non-invasive and low cost.

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