

Study of Palmar Dermatoglyphic Pattern in the Intersex of Selected Bengaluru Population

Priyadarshini. P.A^{1*}, Eesha B.R², Revathi. S³, and Pavithra. R⁴

¹Assistant Professor and ^{2,3,4}(UG Students)

Department of Genetics, Vijaya College, R.V. Road, Basavangudi, Bengaluru – 560 004, India

*Corresponding Author E-mail: priyadarshinichintu@gmail.com

Received: 31.03.2016 | Revised: 12.04.2016 | Accepted: 15.04.2016

ABSTRACT

Palmar surface of human hands and feet are covered with the epidermis of skin, consisting of ridges and configurations which are inherited and are permanent. A sample prints of 10 intersex and 20 normal persons (10 normal males and 10 normal females) were taken and considered for the dermatoglyphics study in order to compare different parameters like triradii angles (ATD, TAD and ADT), ridge count (a-b, b-c and c-d), length, width and ridge patterns. It was observed from the study that there is a increase in ATD angle, ridge count a-b and high tented arc in intersex people when compared to that of normal person. However, the other parameters like length and width are coinciding with normal males and females.

Key words: Dermatoglyphics, Intersex, Palm, Ridge count, Parameters

ABBREVIATIONS:

1. Ridge count -

(a-b)- Counting ridge from "a" triradii to "b" triradii (Nos.)

(b-c)- Counting Ridge from "b" triradii to "c" triradii (Nos.)

(c-d)- Counting Ridge from "c" triradii to "d" triradii (Nos.)

2. Tri-radius angle - It is the feature of the palm that captures the relative position of three tri-radii- a, t and d. The angles are of ATD, TAD, ADT – 'A' as tri-radius found below the index finger, 'T' as axial tri-radius above the wrist crease, 'D' as tri-radius present below the little finger.

INTRODUCTION

Dermatoglyphics is one of the applied branch of genetics which deals with the study of ridge patterns of palm and sole. Ridges/Fingerprints are the informative genetic markers of susceptibility to persons for certain disease with high specific manifestation (Genetical, Hormonal and Heredity) and they are unchanged over a life time of an individual.

Study of genetic marker started in 19th century by Sir Francis Galton and he was first person to propose that there is a connection between human prints and genetics.

Harold Cummins known as father of dermatoglyphic showed an important significance in forensic science, genetics and medicine^{2,3,4}. Intersex are the individuals who have sex characteristics of both males and females. Which is due to the hormonal circumstances that the way that the sex organs develop in males and females⁵. Related to this some of the examples that which are influenced by mutation for hormonal change are:

Cite this article: Priyadarshini, P.A., Eesha, B.R., Revathi, S. and Pavithra, R., Study of Palmar Dermatoglyphic Pattern in the Intersex of Selected Bengaluru Population, *Int. J. Pure App. Biosci.* 4(2): 169-176 (2016). doi: <http://dx.doi.org/10.18782/2320-7051.2256>

1. Androgen Insensitivity syndrome
2. Congenital Adrenal Hypoplasia
3. 5 α -Reductase Deficiency

MATERIAL AND METRHOD

The study was conducted on 30 intersex people, 10 normal males and 10 normal females, in Bengaluru district, Karnataka state. The samples are taken using ink method. Where the ink is applied on both hand with help of ink pad and they are been imprinted on paper and they are taken for further physical and morphological analysis for different parameters and the readings were tabulated and statistically analyzed.

OBSERVATIONS

The morphological parameters observed were: length and width

The quantitative parameters observed were: Inter digital ridge count of both hands (a-b, b-c and c-d) and Triradii angles (ATD, TAD and ADT).

The qualitative parameters observed were: The types of pattern on each finger;

- 1.Ulnar loop
- 2.Radial loop
- 3.Double pocket loop
- 4.Tented arch
- 5.Simple arch.

All these data thus obtained were computed for comparative study.

RESULT AND DISCUSSION

The morphometric analysis of palm size of intersex, normal males and females have revealed that the length of the intersex and

normal females are coinciding, where the length (Plate:1) Fig.1 of normal males are comparatively high than the intersex of both right and left hand. Whereas in the case of width (Plate:2) Fig.2, the intersex peoples are coinciding with normal male, but where width of normal females are comparatively less.

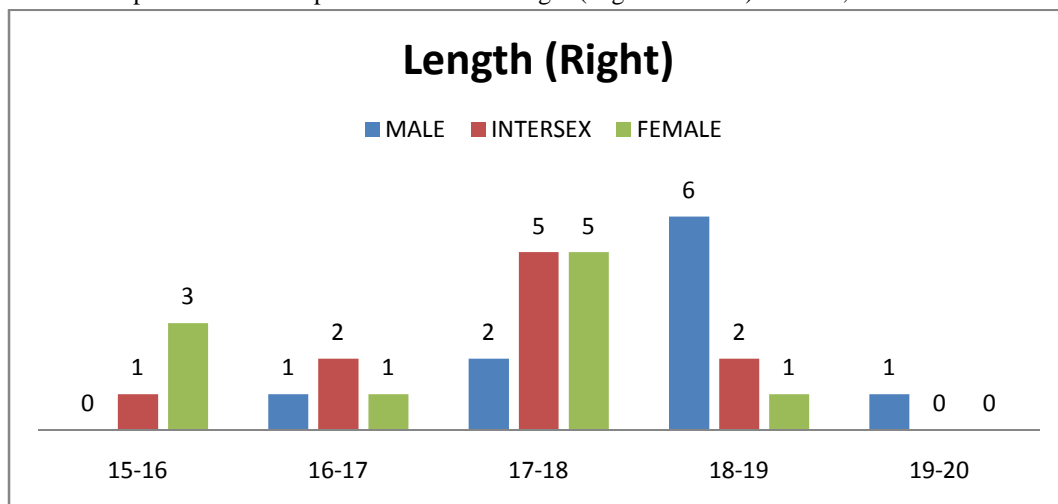
Where in quantitative analysis the parameters like RC a-b (Plate:3) Fig.3 and ATD angles (Plate:6) Fig.4 of both left and right are high in intersex when compared to normal males and females. But whereas the parameters like ADT angle (Plate:8) Fig.8, intersex are coinciding with normal males, but females are comparatively having more range than intersex. But for parameters like RC b-c (Plate:4) Fig.4,the intersex are coinciding with normal females, whereas in males these parameters are ranging less when compared to intersex.

In RC c-d (Plate:5) Fig.5 intersex are having less range then male but more frequency then females. But in TAD angle (Plate:7) Fig.7, the frequency of intersex is coinciding with both male and female.

In qualitative analyses the tented arc are seen more in intersex in all the 10 fingers, but where in normal males and females they not are present in all fingers, but found in middle and index finger of both right and left hands only (Fig.9).

Doris Borger *et al.*⁶ compared 42 patients with a case of congenital adrenal hyperplasia where in these peoples the excess of whorls are seen, but where in intersex peoples tented arc are seen more. In CAH case peoples missing "c" triradius are observed where in intersex it is present.

Plate:1 Morphometrical Comparision Of Palm Length (Right And Left) In Male, Intersex And Female



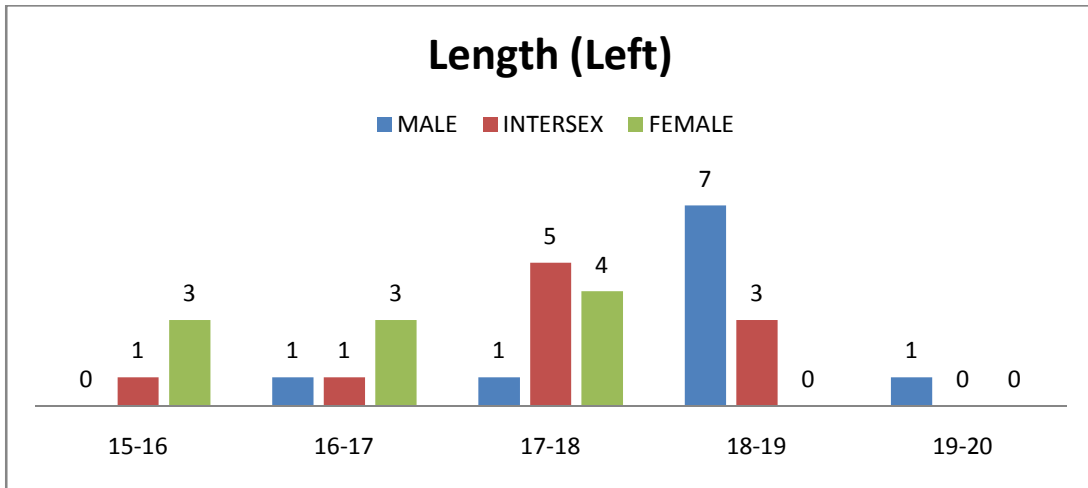


Plate:2 Morphometrical Comparision Of Palm Width (Right And Left) In Male, Intersex And Female

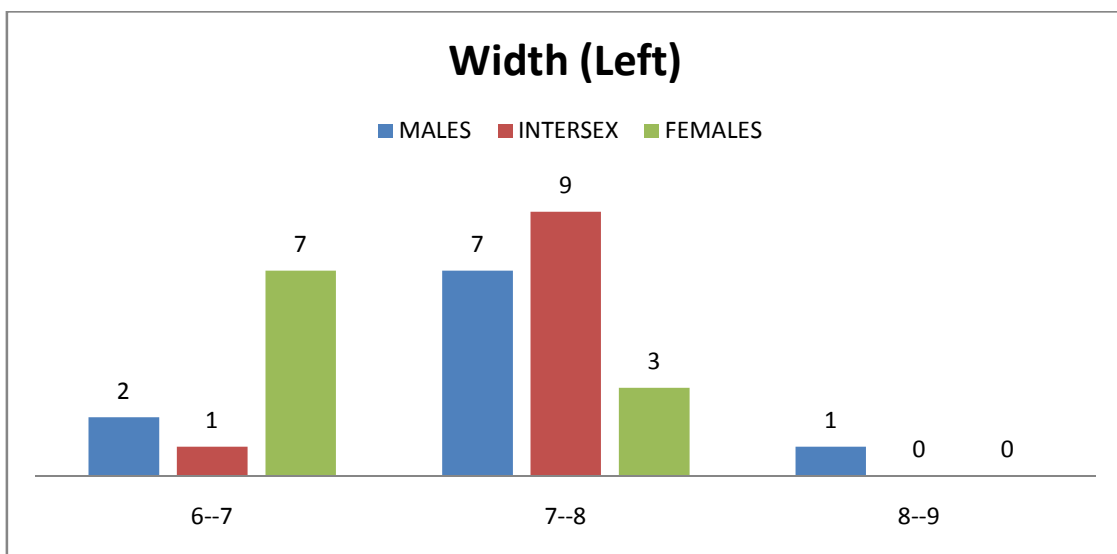
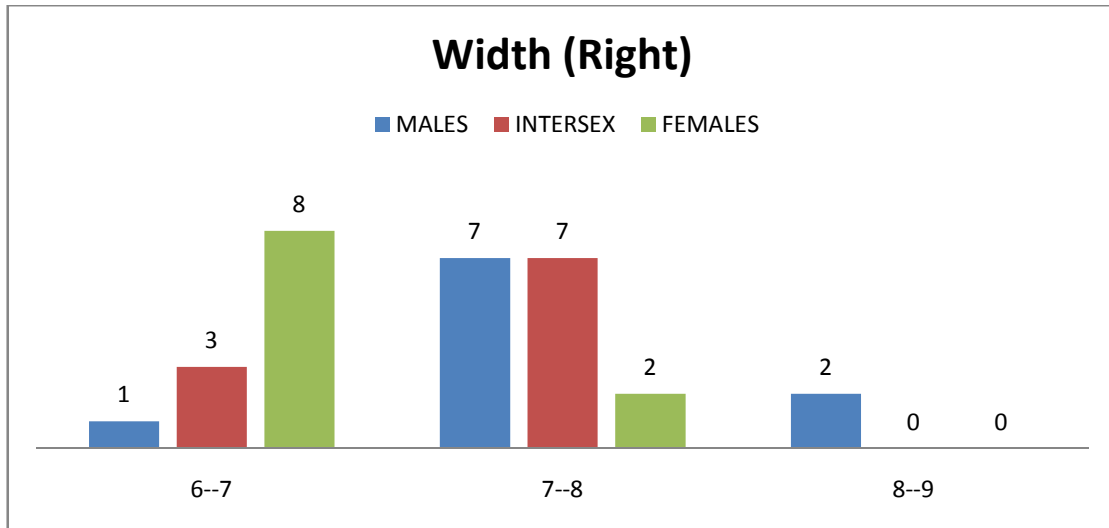


Plate:3 Comparison Of Quantitative Parameter Ridge Count A-B (Right And Left) In Male, Intersex And Female

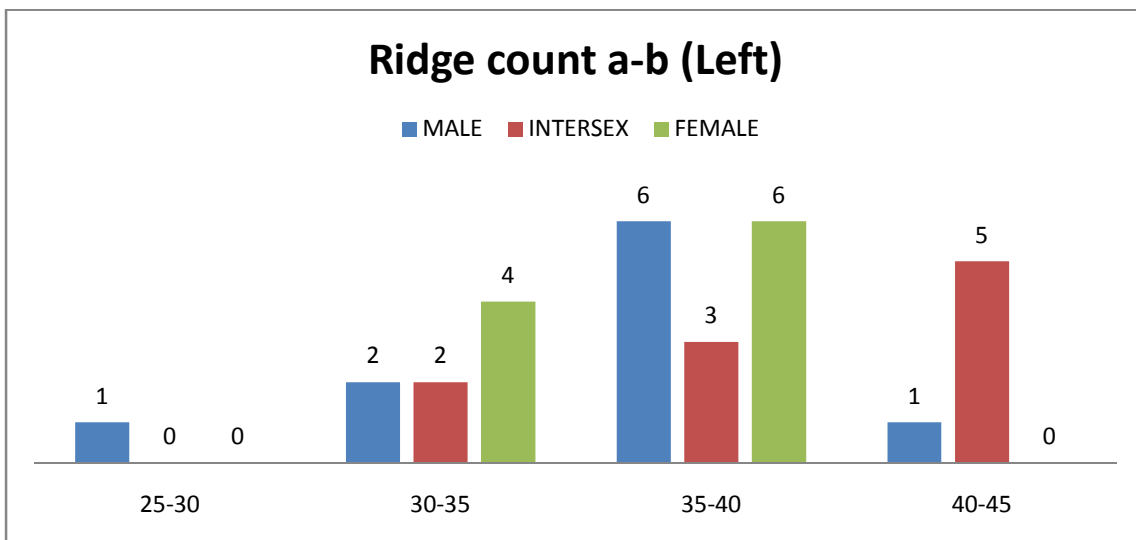
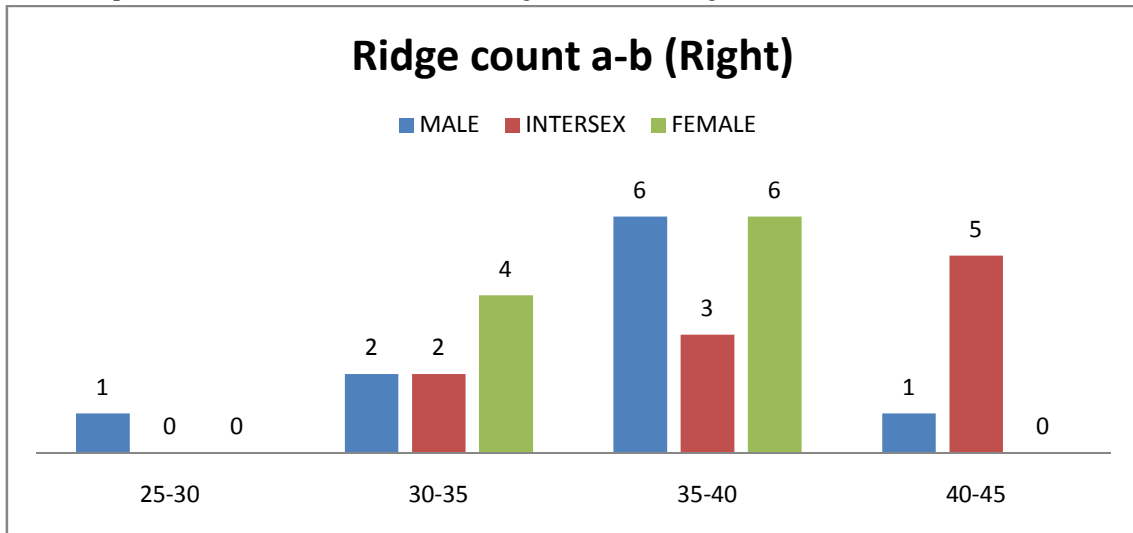
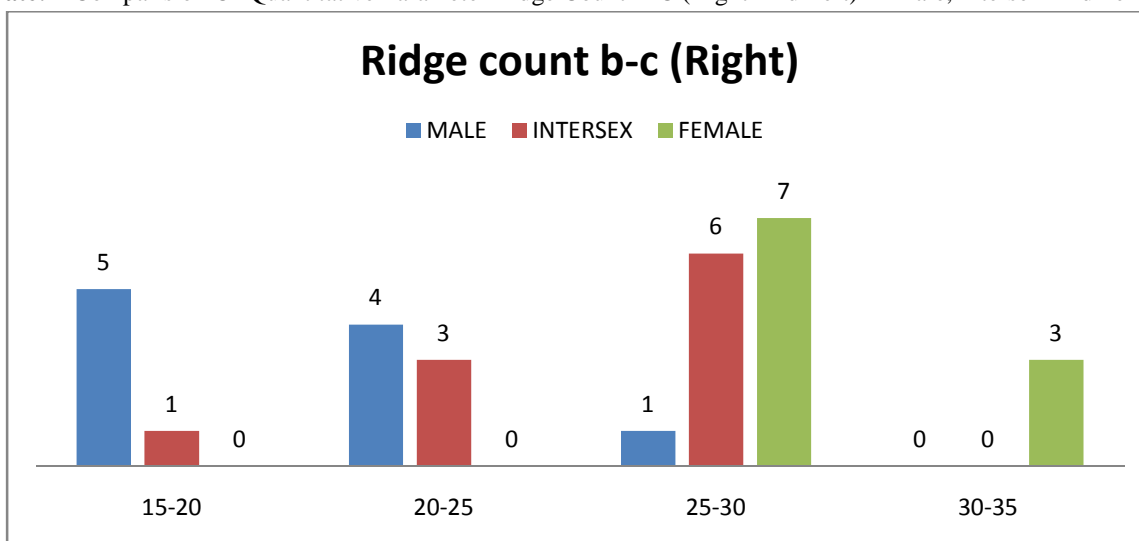


Plate:4 Comparison Of Quantitative Parameter Ridge Count B-C (Right And Left) In Male, Intersex And Female



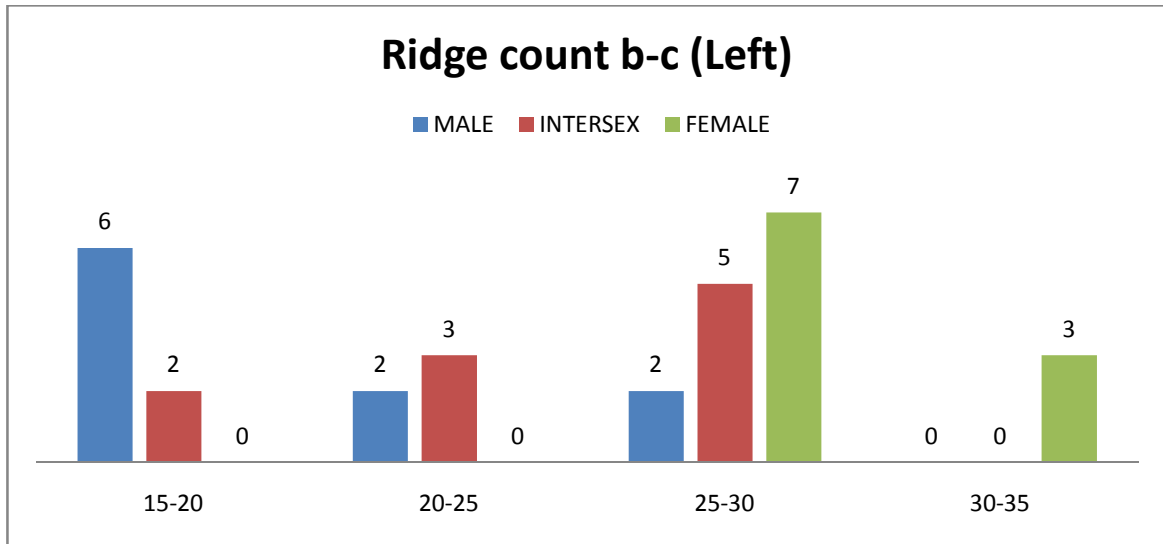


Plate:5 Comparison Of Quantitative Parameter Ridge Count C-D (Right And Left) In Male, Intersex And Female

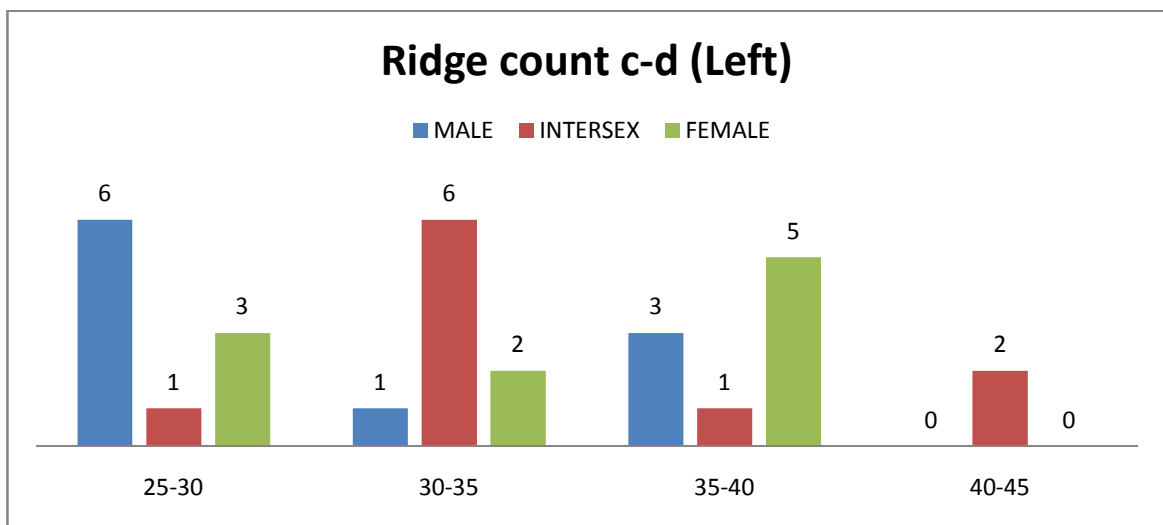
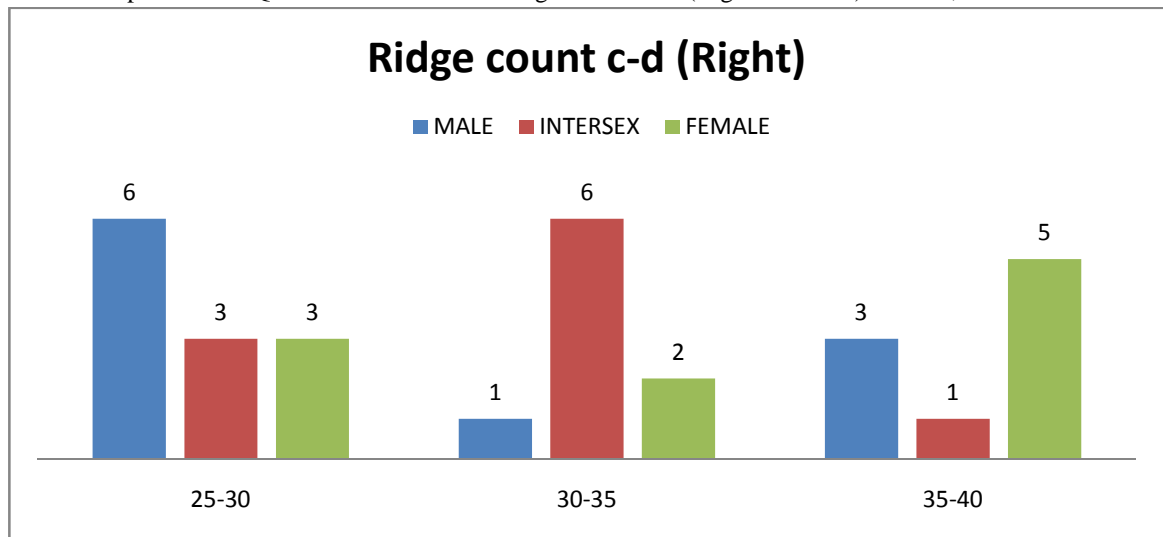


Plate:6 Comparison Of Quantitative Parameter Triradii Angles -Atd (Right And Left) In Male, Intersex and Female

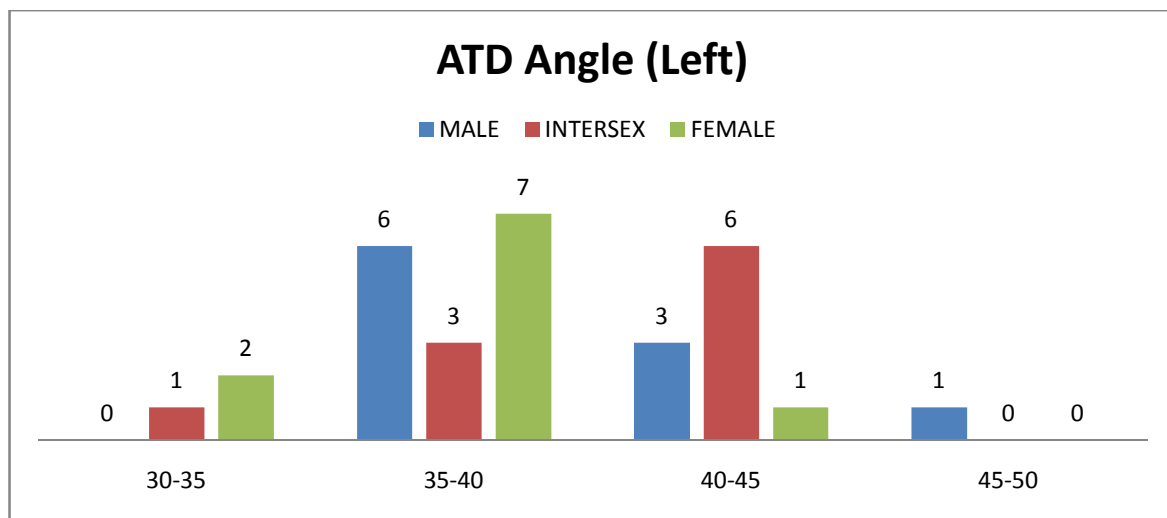
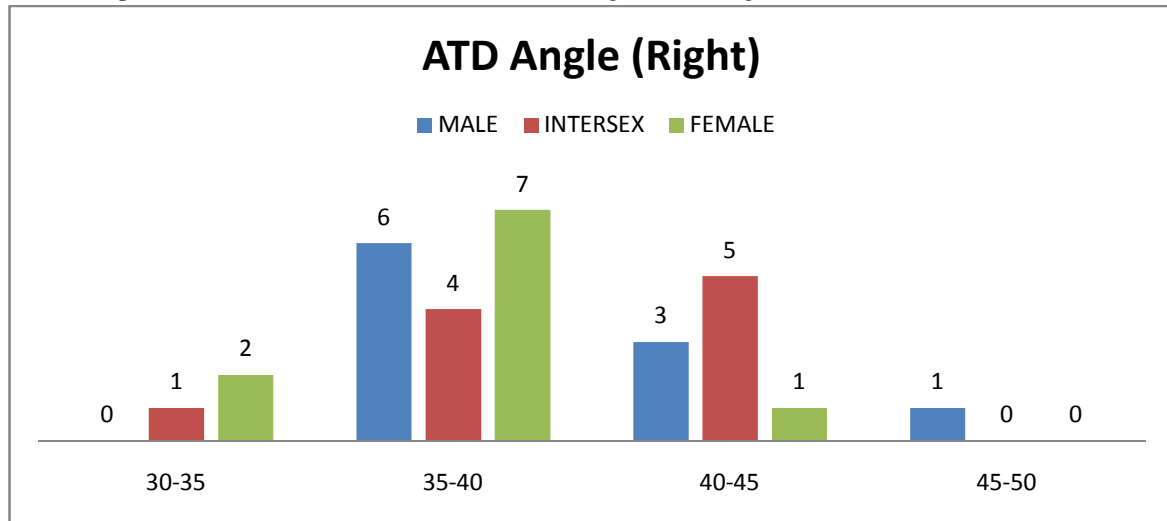
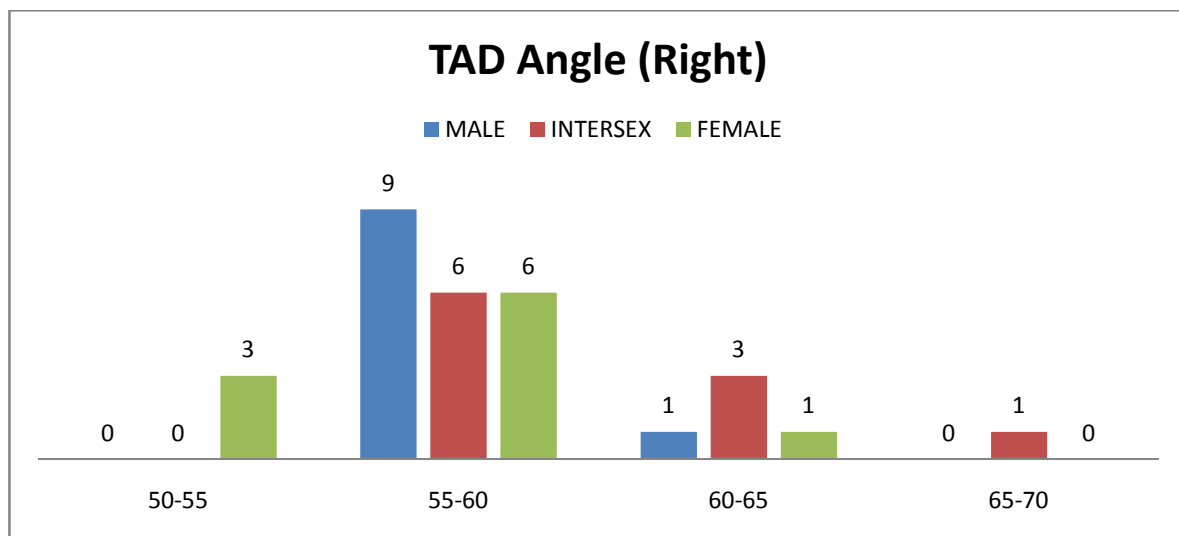


Plate:7 Comparison Of Quantitative Parameter Triradii Angles - Tad (Right And Left) In Male, Intersex and Female



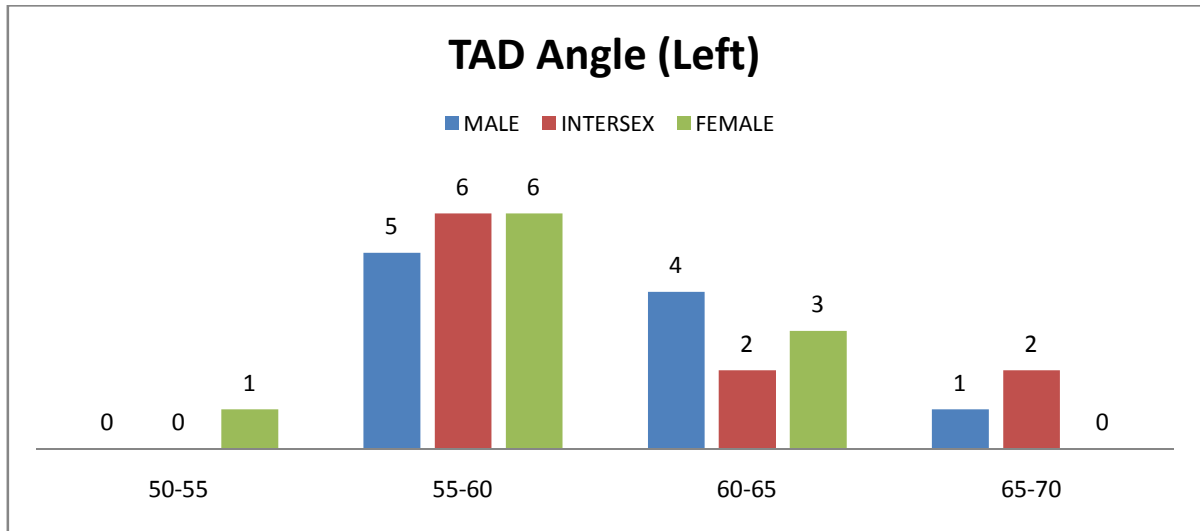
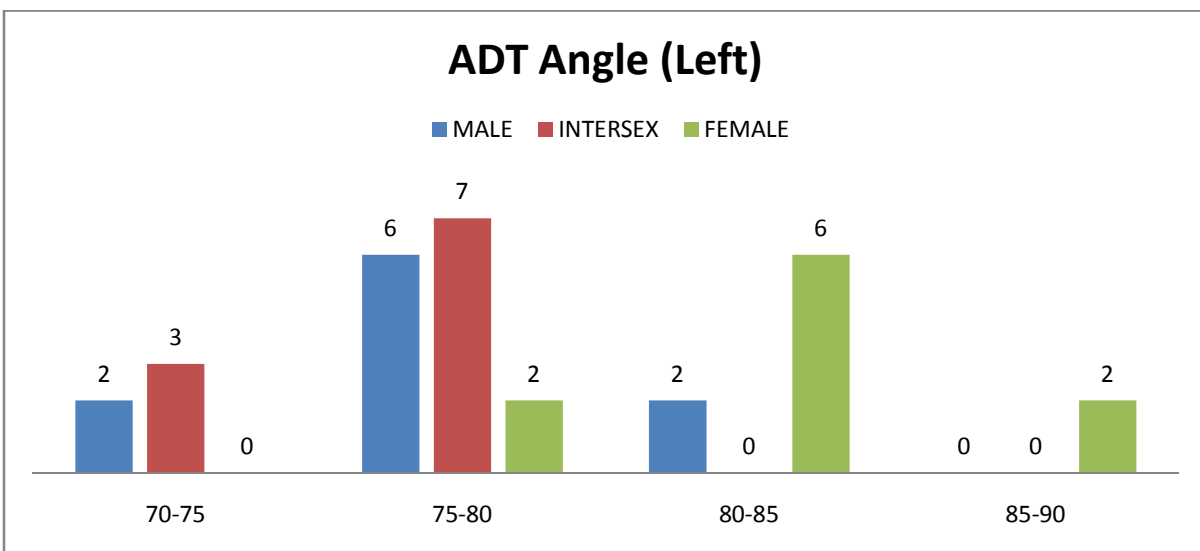
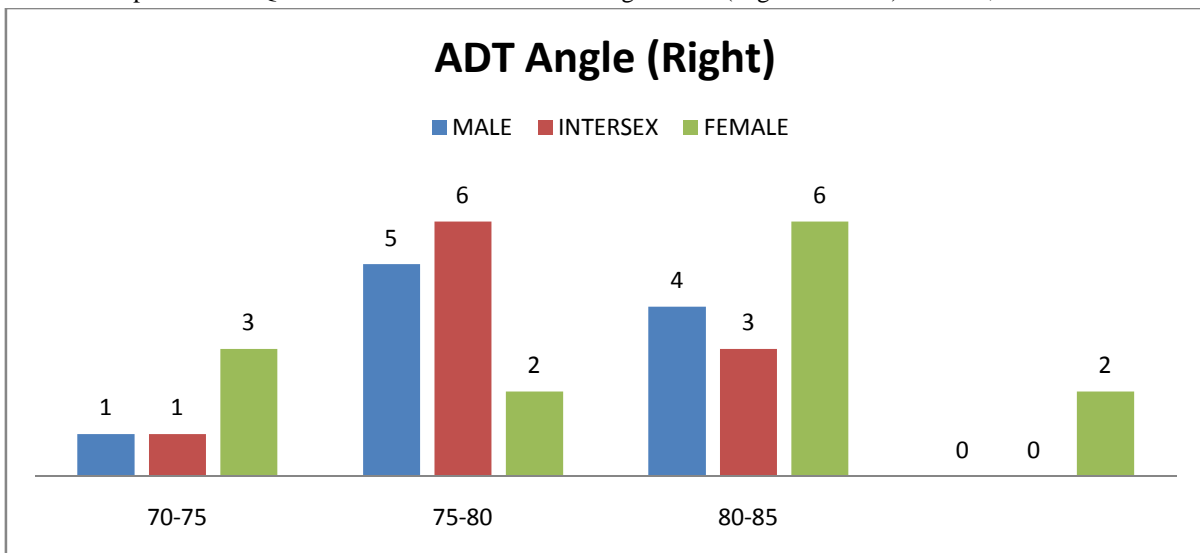


Plate:8 Comparison Of Quantitative Parameter Triradii Angles -Adt (Right And Left) In Male, Intersex and Female



CONCLUSION

Since very less report has been cited on this cases, the present study was under taken to know how far the intersex people show variations from normal male and female. From the above study, it is clear that inter sex people are coinciding with both males and females with respect to morphological, qualitative and quantitative analysis of the palm pattern.

The ATD angle and RC (a-b) are high in intersex other rest parameters are coinciding with males and females. Whereas the tented arch are seen in intersex in all 10 fingers but found in normal males and females, the other geometry are not showing much difference.

Hence it is clearly indicating hormonal changes in people have role in dermatoglyphic patterns which can serve as an icon to identify individuals from large populations.

REFERENCES

1. Francis Galton, Finger print directories (London; Macmillan and co. 1895).
2. H. Cummins (1943), Analysis of dermatoglyphics science.
3. Schaumanm (1976), Dermatoglyphics in medical disorders. NewYork Heidelberg Berlin: Springer-Verlag.
4. Reed, Quantitative and Qualitative study of dermatoglyphic patterns in twins. *American Journal of Medical Genetics*, **140A**: 262-271 (2006).
5. Britisl Lek Listy (1979), Intersexual differences in dermatoglyphic minutiae.
6. Doris Borger.*et.al*, Dermatoglyphic in congenital adrenal hyperplasia.