A-b Ridge Count and Its Correlation with Epilepsy

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Abstract

The study of ridges of skin is called dermatoglyphics. It is recognized as a valuable method for medicolegal and anthropological studies. The permanency of the finger patterns, the extreme variability from one individual to the other and easy analysis are some of the reasons for its wide applications in a variety of conditions. Dermatoglyphic patterns are determined by genetic factors. It has been proved that genetic factors are responsible for idiopathic epilepsy. Hence there is a scope for the study of relationship between epilepsy and dermatoglyphic patterns.

Objectives : • To study the A-b ridge count in generalized tonic clonic seizure patients.

• To compare this dermatoglyphic configuration of cases with the normal population.

Methods : The ink method was followed to take finger and palm prints. The palmar prints of 50 epileptic patients and 50 normal individuals of both sexes were collected for the study.

Conclusion: There is no significant association found between a-b ridge count and epilepsy patients when compared to normal.

Key Words: *Dermatoglyphics, a-b ridge count, Epilepsy.*

Introduction

Dermatoglyphics is often claimed to be associated with several diseases like congenital heart disease (Alter and Schllenberg 1970), Schizophrenia (Bramon et al 2005), cancer (Abbasi et al 2006), genetic disorders. (Mukharjee 2007) and diabetes (Kumbani 2007). Abnormality in the genetic configurations of parents is inherited by children and is reflected in the dermatoglyphic pattern.[4] Hence dermatoglyphic study proves to be a very useful, easily applicable, inexpensive, indispensable tool as an indicator in the diagnosis of hereditary diseases in patients. Epilepsy is a chronic brain disturbance of varied and complex origins, characterized by recurrent convulsive seizures, not necessarily presenting a defined external trigger factor. The etiology of the epilepsies allows a classification of syndrome features into two groups – idiopathic or cryptogenic epilepsy, which has isolated primary symptoms without apparent cause and is probably hereditary and finger print configurations are inherited with an embryonic origin common to nervous system. Their attractions indicate pleiotropic effects of the genotype responsible for enaphalographic irregularity and convulsive seizures[3]

Palmar Pattern Configuration : The palm has been divided into several anatomically defined areas for dermatoglyphic analysis in different individuals, such as thenar, hypothenar and interdigital areas. These areas approximate the sites of embryonic volar pad. Thenar and first interdigital area : Thenar and first interdigital areas are considered as one area labelled thenar/ first interdigital (Th/I1). In most of the cases there is no pattern in this area but the ridges follow a mild curve around the base of thumb. Patterns when present are most often loops; whorls are rarely encountered.

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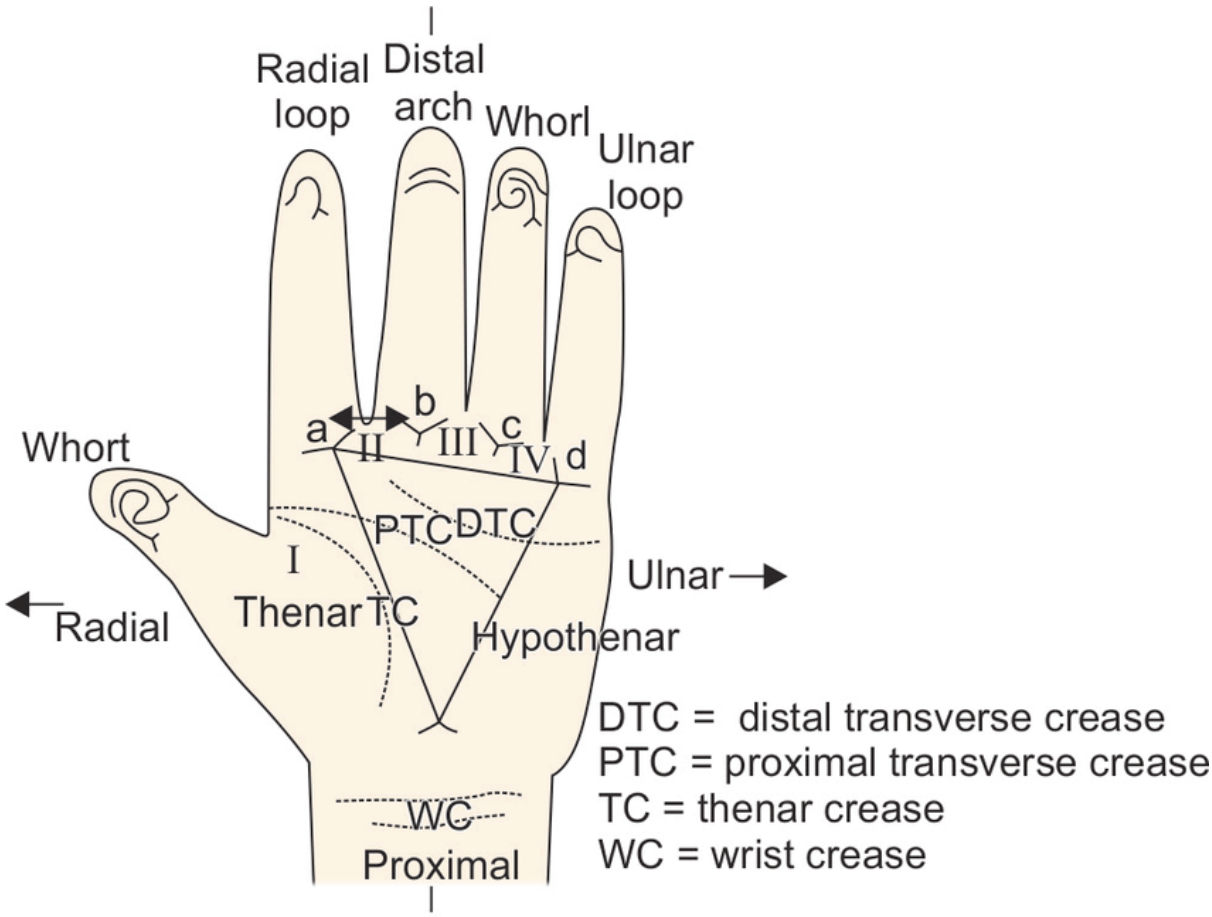
Second, third and fourth interdigital areas : The second, third and fourth interdigital areas are found in the distal palm in the region of heads of metacarpal bones. Each interdigital area is bordered laterally by digital triradii. Digital triradii are labelled a, b, c and d, starting from the triradius located at the base of digit II and moving toward the triradius associated with digit V. The second interdigital area I2 lies between triradii a and b, the third interdigital area I3 between triradii b and c and the fourth interdigital area I4 between triradii c and d. If a digital triradius is absent, the midpoint of the base of corresponding digit can be used to separate interdigital areas. Configurations of an interdigital region may be a true pattern (loop, whorl), a vestige or an open field. They are the most common patterns found in the distal palm.[1,2]

a-b ridge count : It is defined as the number of ridges intersected by a line drawn between 'a' triradius (at the base of index finger) and 'b' triradius (at the base of middle finger) of the palm in each hand.[1]



Method of collection of data : The palmar prints of consecutive patients diagnosed as Generalised tonic clonic seizures were collected for the study.

Inclusion criteria :

• Age between 15 to 60 years.

• Both male and female sex included.

Exclusion criteria :

• Patients associated with other psychiatric illnesses.

• Patients associated with mental retardation.

• Patients with history of trauma and other medical illnesses. Equal number of age and sex matched individuals who have no medical and psychiatric illness, with no past history or family history of seizures served

as controls.

Sample size : 50 cases and 50 controls.

METHODOLOGY : Standard INK method as described by Cummins and Midlo was adopted to take palm prints in present study. The hands of the subjects were cleaned with soap and water and dried. Subsequently the hands were wiped with spirit lightly to remove any greasy particles. Required amount of daub was placed on glass slab. It was uniformly spread by rubber roller to get a thin even ink film on glass slab.

The palm of the individual's right and left hand was inked with the help of rubber roller. The crystal bond paper was rolled forwards on to the wooden roller. The wrist of the palm was kept on the roller and it was rolled backwards by applying pressure on the zone of flexion creases at wrist, ulnar margin, flexion creases in central region of hand and over the knuckles. 40 Thus the print appeared on the crystal bond paper. Soon after the print was taken the sheets were coded with Name, Age and Sex for Cases and Controls, and then subjected to detailed analysis, ridge counting with magnifying lens and sharp needle.

Materials used : 1) Kores quick drying duplicating ink, 2) Rubber roller, 3) Wooden roller 4) Inking slab, 5) Cotton puff and spirit, 6) Scale, 7) Crystal bond paper, 8) Pencil, 9) Protracter,10)Magnifying lens, 11)Soap and towel.(Fig 1)

Fig 1: Materials used

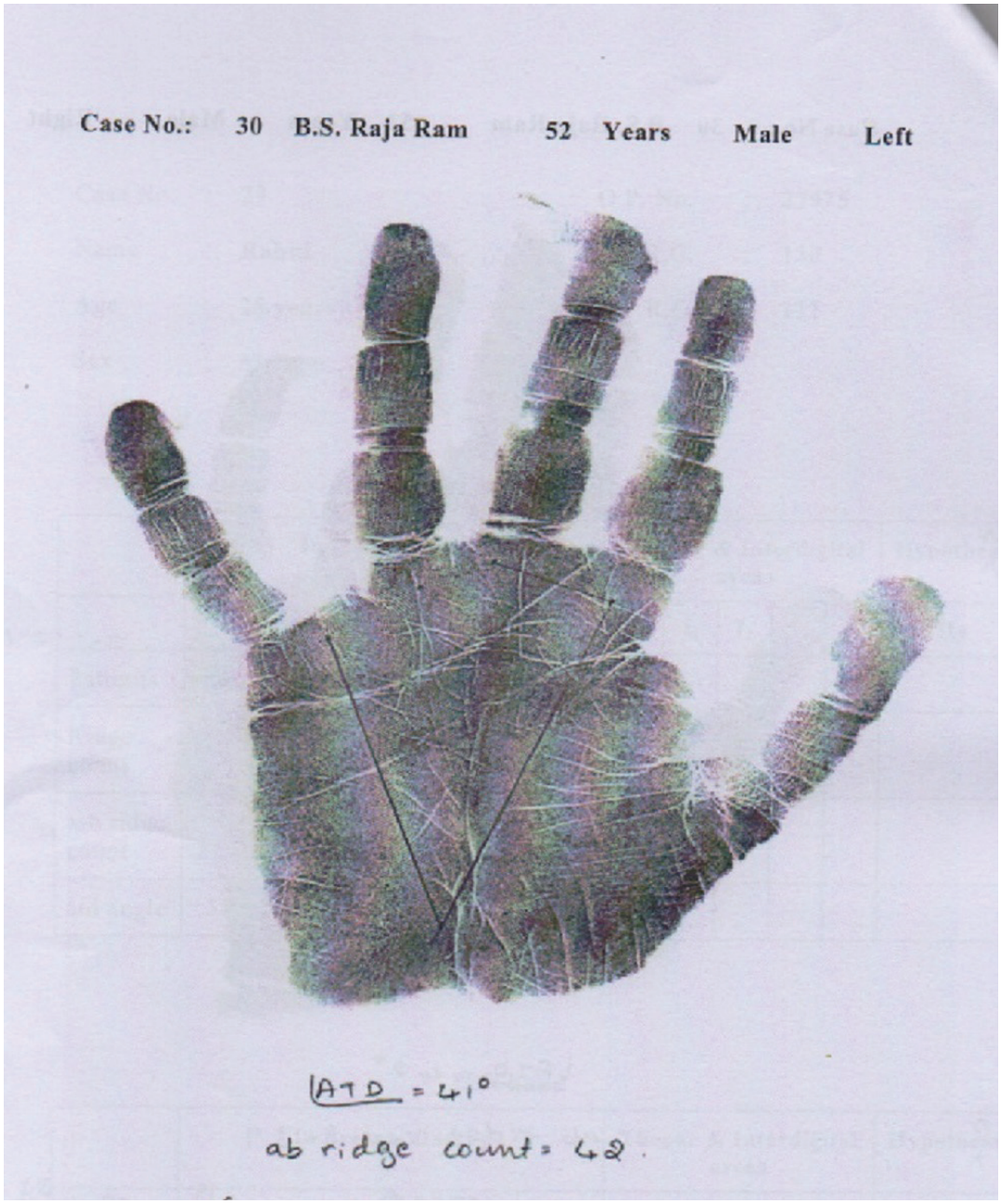


Fig 2: Number of ridges intersected by a line drawn between 'a' triradius (at the base of index finger) and 'b' triradius (at the base of middle finger) of the palm in each hand was measured.

Statistical Analysis

Descriptive statistics were presented as mean and standard deviation for continuous data and number and percentage for categorical data. Z-test / unpaired 't' test was used for comparing the means of two groups (cases Vs controls). Categorical data was anlaysed by chi-squire test and Fisher's exact test wherever necessary. P-value of 0.05 or less was set for statistical analysis.

Results

TABLE NO 1: STATISTICAL CALCULATION OF a-b RIDGE COUNT IN RIGHT AND LEFT HAND OF MALE EPILEPTICS AND CONTROLS

ab ridge count	Males					
	Cases (25)		Controls(22)		t	P
	Mean	SD	Mean	SD		
Right	35.3	4.4	34.0	6.2	0.84	0.41, NS
Left	35.3	7.2	33.2	6.0	1.08	0.29, NS

TABLE NO 2: STATISTICAL CALCULATION OF a-b RIDGE COUNT IN RIGHT AND LEFT HAND OF FEMALE EPILEPTICS AND CONTROLS

ab ridge count	Females					
	Cases (25)		Controls(28)		t	P
	Mean	SD	Mean	SD		
Right	33.8	5.1	35.3	7.3	0.86	0.39, NS
Left	34.2	5.8	34.3	6.2	0.06	0.95, NS

TABLE NO 3: STATISTICAL CALCULATION OF a-b RIDGE COUNT IN RIGHT AND LEFT HAND OF COMBINED SERIES OF MALE AND FEMALE EPILEPTICS AND CONTROLS

ab ridge count	Male+Females					
	Cases (50)		Controls(50)		t	P
	Mean	SD	Mean	SD		
Right	34.6	4.8	34.8	6.8	0.17	0.87, NS
Left	34.7	6.5	33.8	6.1	0.71	0.48, NS

The present study shows decrease mean value in right hands of cases and increase mean value in left hands of cases when compared to controls and difference found in a-b ridge count between epileptics and controls is statistically not significant.

Discussion

Nandlal, R.K. Sureka observed that the mean values of a bridge count for right and left hands in controls were 34.62 and 35.9 respectively, while in case of epilepsy the values were 36.88 and 39.04 respectively. In the present study the mean values of ab ridge count for right and left hands in controls are 34.8 and 33.8 respectively, while in case of epilepsy the values are 34.6 and 34.7 respectively.[17]

P.Ranganath that there was no significant difference in a-b ridge count between patients and controls in male or female.[19]

A study by Schaumann in 197 adult Caucasian males with epilepsy showed decreased a-b ridge count on both left and right palm[24]

Ana Tarca observed a surprising decrease of the distance between triradia "a" and "b" marking the limits of this compartment much under the average values recorded for Romanian populations.[20]

The present study shows mean a-b ridge count is lower in cases than controls on right hand and higher in cases than in controls on left hand. The difference found is statistically not significant.

Conclusion

The present study has been undertaken to find out the existence of any correlation between palmar dermatoglyphic parameter ab ridge count of patients having generalized tonic clonic seizures (GTCS) and normal individuals and the data obtained testify to a certain diagnostical and prognostical value of dermatoglyphical features. These results provide further evidence that dermatoglyphic abnormalities exist and that the a-b ridge count may not be a marker of disruption, probably environmental, that occurs when the brain may also be particularly vulnerable to such insult.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance : Taken from institution.

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