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RESEARCH ARTICLE

DERMATOGLYPHICS RELATED TO INTELLIGENT QUOTIENT LEVEL OF MEDICAL UNDERGRADUATE STUDENTS

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ABSTRACT

Background: Dermatoglyphics is the study of dermal ridge pattern on the volar surface of digits, palm and sole. The development of dermal ridges starts from 12th-13th week of gestation and by around 20th week, well differentiated recognizable dermal ridges are formed. Intelligence quotient (IQ) level has a very significant effect on individuals and on society. Genetic factors influence both intelligent quotient level and dermatoglyphics.

Aim: Our aim is to analyse and associate dermatoglyphics to intelligent quotient level of medical undergraduates.

Materials and Methods: Finger and palm prints were collected from 200 medical undergraduates between the age group of 17-20 yrs by standard Indian ink method and their IQ level assessed using Raven's Standard Progressive Matrices.

Results and Conclusion: The results of our study showed a significant association between finger print patterns of right index, right ring and left ring fingers and IQ.

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INTRODUCTION

The Greek word 'Dermatoglyphics' is derived from 'Derma' meaning skin and 'glyphics' meaning curved. It is the study of dermal ridge pattern on volar surface of digits, palm and sole (Cummins and Midlo, 1929). It is an established scientific fact that no two individuals, including monozygotic twins, have the same fingerprints and other details of dermal ridges. The development of dermal ridges starts from 12th-13th week of gestation and by around 20th week, well differentiated recognizable dermal ridges are formed (Gyenis, 2000; Penrose and Ohara, 1973; John J Mulvihill and David W Smith, 1969). As genetic or chromosomal abnormalities might be reflected as alterations in dermal ridges, they can be used as an easily accessible tool in the study of genetically influenced diseases (John J Mulvihill and David W Smith, 1969). Finger print pattern are classified into three types, Loops—60-65%, Whorls—30-35%, Arches—5% (Gyenis, 2000). Intelligence quotient (IQ) level has a very significant effect on individuals and on society. In some cases, individuals with low IQ will never achieve personal independence, and the need for care will persist throughout their lifetime. This condition is more than 50% prenatal in origin (Marilyn, 1972). Many Chinese studies are done to correlate dermatoglyphics of palm and sole to IQ level. To our knowledge this is the first Indian study to show a correlation between dermatoglyphics and IQ level of medical undergraduate students.

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Aim

To analyse and associate the dermatoglyphic patterns to the IQ level of medical undergraduate students

Objectives

1. To obtain finger and palm prints of medical students
2. To note dermal ridge patterns in finger and palm prints
3. To identify IQ level in medical students
4. To compare finger print patterns with varying IQ levels

MATERIALS AND METHODS

Dermatoglyphic prints of 200 undergraduate medical undergraduate students (128 females and 72 males between the age group of 18- 20 years) of Vinayaka Missions University, Salem, were collected after obtaining the Institute ethical committee clearance and informed consent from the students.

The standard Indian ink method (Cumins and Midlo) was used[1]. The hand pre-smeared with ink was rolled on the paper placed over a round bottle to get the palm print. The rolled finger prints were taken by the rotation of fingers. Finger and palm prints of both right and left hands were obtained and the following patterns were noted: Ulnar loop, Radial loop, Arch, Whorl (double loop, spiral). Total Finger Ridge Count (TFRC), ab ridge count and atd angle were measured, (Fig. (1) &(2)) (Schaumann and Alter, 1976). The subject's IQ level were identified using Raven's Standard Progressive Matrices (2003) and categorised into five grades and grouped as A and B. Group A – grade I and II and Group B –grade III, IV and V. Chi-square test was used to compare different finger print patterns with different groups of students with varying IQ level. Paired-T test was used to compare the means of 'ab' ridge counts, 'atd' angle and Total Finger Ridge Counts (TFRC) of both right and left hands.

Fig. 1. Right hand impression showing 'atd' angle and 'ab' ridge count

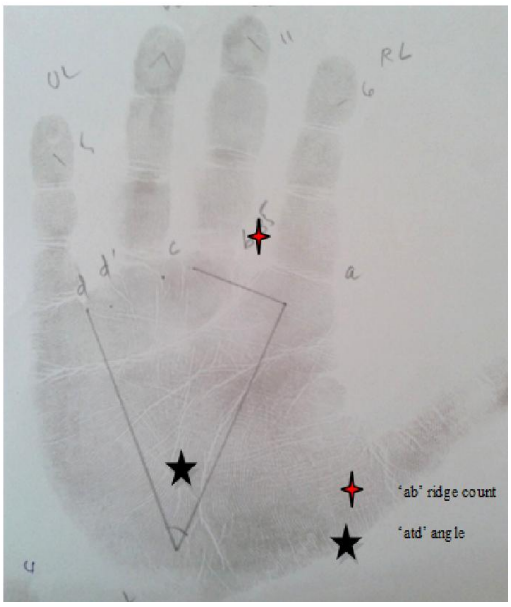

Fig. 2. Left hand impression showing 'atd' angle 'ab' ridge count

RESULTS

Of the 200 students, GROUP A were 48.3% and GROUP B were 51.7% In GROUP A, more whorl patterns were seen in the right index finger compared to GROUP B, where more arch patterns were seen (p = 0.01) (Table 1), more whorl patterns were seen in right and left ring finger in GROUP A compared to GROUP B where more arch and ulnar loops were seen (p = 0.008 & 0.02 respectively) (Table 2 and Table 3) No significant association was observed between IQ level and other finger print parameters such as 'ab'ridge count, 'atd' angle and Total Finger Ridge Count (TFRC).

Table 1. Number (%) of finger patterns on right index finger (*p = 0.012)

	Arch	Radial Loop	Ulnar Loop	Whorl
GROUP A	2	5	41	49
n = 97	(2.1)	(5.2)	(42.3)	(50.5)
GROUP B	10	6	55	32
n = 103	(9.7)	(5.8)	(53.4)	(31.1)

Table 2. Number (%) of finger patterns on right ring finger (*p = 0.008)

	Arch	Radial Loop	Ulnar Loop	Whorl
GROUP A	0	0	30	67
n = 97	(0)	(0)	(30.9)	(69.1)
GROUP B	2	0	51	50
n = 103	(1.9)	(0)	(49.5)	(48.5)

Table 3. Number (%) of finger patterns on left ring finger (*p = 0.02)

	Arch	Radial Loop	Ulnar Loop	Whorl
GROUP A	1	1	33	62
n = 97	(1)	(1)	(34)	(63)
GROUP B	6	0	49	48
n = 103	(5.8)	(0)	(47.6)	(46.6)

DISCUSSION

A number of studies have shown the importance of dermatoglyphics as markers of prenatal disturbance in developmental disorders of unknown origin. Genetic and non-genetic factors are involved in the aetiology of Intellectual Disability (ID), although the cause remains unknown in up to 50% of cases. (Rossa *et al*., 2001; Najafi, 2009; Saadat and Mehdipour, 2006; Rajangam *et al*., 1995) The results of an Iranian study, Association between Finger Patterns of Digit II and Intelligence Quotient Level in Adolescents, support an association between some dermatoglyphic patterns seen on the right digit II with IQ level. The study of right digit II showed that the normal adolescents in comparison with the talented (assessed using Ravens Standard Progressive Matrices) ones possessed a greater number of the whorl patterns (P=0.02), whereas the latter had more ulnar loops than the former (Najafi, 2009). In a Study on Correlativity between Skin Ridge of Finger and Palm in the Human and Intelligence Development, the result showed that ridge count of digital end was positively correlated with IQ value correlative coefficient r =0.8319 (Chen lan-ying *et al*., 1999-03). The results of our study, showed significant association between IQ level and fingerprint

pattern of right index finger in accordance with the Iranian study (Najafi, 2009), and also right ring and left ring finger. In GROUP A, more whorl patterns were seen in the right index finger compared to GROUP B, where more arch patterns were seen ($p = 0.01$), more whorl patterns were seen in right and left ring finger in GROUP A compared to GROUP B where more arch and ulnar loops were seen ($p = 0.008$ & 0.02 respectively).

Conclusion

It is to the educator's advantage to teach and test students, according to their IQ level. According to the present study, there is a relationship between IQ level and different finger print patterns of right index, right ring and left ring fingers. However, from our study, no conclusions about the relationship of any one individual's finger prints to his own IQ level can be drawn. Further studies with more sample size and additional dermatoglyphic parameters are needed to develop this research.

REFERENCES

Chen lan-ying *et al*. A Study of Correlativity between Skin Ridge of Finger and Palm in the Human and Intelligence Development. Hereditas (Beijing) 1999-03.

Cummins H and Midlo C. 1929. Revised methods of interpretation and formulation of palmardermatoglyphics. *Am J PhyAnthr*., 12:415-502.

Gyenis G.A. 2000. Short history and some results of the dermatoglyphic studies in Hungary. ActaBiologica Szegediensis, 44(1-4):135-38.

John J Mulvihill and David W Smith. 1969. The Genesis of Dermatoglyphics. *Journal of Pediatrics*, 75 (4): 579-89.

Marilyn P. 1972. Dermatoglyphics and Syndromes. *Amer J Dis Child*, Dec, 124(4): 933-43.

Najafi M. 2009. Association between Finger Patterns of Digit II and Intelligence Quotient Level in Adolescents. *Iran J Paeaditr*., Sep ;19(3): 277-84.

Penrose L.S and Ohara P.T. 1973. The development of the epidermal ridges. *Journal of Medical Genetics,* 10: 201-208.

Rajangam S. *et al*. 1995. Dermatoglyphics in Down's syndrome. *J Indian Med Assoc*., Jan;93(1):10-3.

Raven, J., Raven, J. C., & Court, J. H. 2003. Manual for Raven's Progressive Matrices and Vocabulary Scales. San Antonio, TX: Harcourt Assessment.

Rossa A, Gutierrez B, Arias B and Fananas L. 2001. Dermatoglyphics and abnormal palmar flexion creases as markers af early prenatal stress in children with idiopathic intellectual disability. *Journal of Intellectual Disability Research*, 45: 416-423.

Saadat M. and Mehdipour P. 2006. Correlation between IQ and dermatoglyphic indices of Down syndrome patients. *Dermatol Online J*., Oct 31;12(6):25.

Schaumann B.A and Alter M. 1976. Dermatoglyphics in medical disorders. New York: NY Springer-Verlag.

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