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Short Communication

Hypothenar Patterns and Autism: A Dermatoglyphic Study

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ABSTRACT

Dermatoglyphic traits are helpful as a low-cost prognosis tool for the early detection of autism. The present study is an attempt to understand the palmar dermatoglyphic variability in terms of the presence or absence of the hypothenar patterns on the palm of Autistic individuals from the (Linguistic group). Results demonstrated the significant ($p<0.05$) presence of hypothenar patterns among the 100 (67 males and 33 females) Autistic individuals compared to the unrelated 100 (55 males and 45 females) controls. The present study revealed that the presence of hypothenar patterns can also act as another prognostic criterion for the early detection of autism.

Keywords: Dermatoglyphics; Hypothenar patterns; Autism

ABOUT THE STUDY

Autism is a complex neurodevelopmental disorder characterised by significant disturbances in social-communicative and behavioural functioning [1]. This complex brain condition presents at around age two with a core set of symptoms that include unusual ways of relating to people, language development and delays, and repetitive or stereotyped behaviors [2]. However, the tempo of autism can be managed and the entire management depends on the early detection and identification of autism [3]. Cerebral and epidermal tissues share some aspects of development, such as similar ectodermal origin, rapid development during the second trimester of gestation and susceptibility to neuronal growth factor dermatoglyphic variations are informative for early developmental brain disturbances [4]. Dermatoglyphic traits are a clinical marker for many neurodevelopment disorders and chromosomal aberrations [5]. The present study is an attempt to understand the relationship between hypothenar Patterns and autism. To achieve this purpose bilateral palm prints were obtained by following the standard ink and roller method [6] among the 100 (67 males and 33 females) clinically diagnosed (according to DSM-IV-TR-American Psychiatric Association, 2000) autistic individuals and 100 (55 males and 45 females) unrelated controls without having any family history of autism people. Cummins and Midlo have reported four primary formations along with eight types of variety of patterns in the hypothenar portion of a palm. Further, another sixteen types of derived variation were also documented [7]. Those pre-defined types of hypothenar patterns (some configurations or identified patterns if comprises of the proximal half of the ulnar portion of the palm then those known as hypothenar patterns) were incorporated in this present attempt. The present study got the Institutional Ethical Clearance from the 'Institutional Ethical Committee for Bio-Medical and Health Research involving Human Participants, University of Calcutta' vide Reference No. 06/ET/19-20/1742, dated 14.06.2019. The bilateral distribution of hypothenar patterns among the Autistic males, females, and control males, and females revealed significant ($p<0.05$) differences in terms of the higher presence of hypothenar patterns in both left and right hands among the Autistic participants than that of the left and right hands of the control males and females (Tables 1 and 2).

Therefore, the present study suggested a significant ($p<0.05$) association between the hypothenar pattern and autism while combining both hands as well as both sexes than that of the controls (Table 3).

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Hypothenar Pattern					
Group		**n**	**Present (%)**	**Absent (%)**	**χ^2 value (df=1)**
Autistic Male	Left hand	67	52 (77.61)	15 (22.39)	53.445*
Control Male		55	6 (10.90)	49 (89.10)	
Autistic Male	Right hand	67	43 (64.18)	24 (35.82)	38.095*
Control Male		55	5(9.09)	50(90.91)	
Note: * p<0.05					

Table 1: Distribution of hypothenar patterns among the autistic males and control males.

Hypothenar Pattern					
Group		**n**	**Present (%)**	**Absent (%)**	**χ^2 value (df=1)**
Autistic female	Left hand	33	25 (75.76)	8 (24.24)	35.98*
Control female		45	4 (8.89)	41 (91.11)	
Autistic female	Right hand	33	17 (51.52)	16 (48.48)	17.35*
Control female		45	4 (8.89)	41 (91.11)	
Note: * p<0.05					

Table 2: Distribution of hypothenar patterns among the autistic females and control females.

Hypothenar pattern		**Autistic participants**	**Control group**	**χ^2 (1df)**
		n=200	**n=200**	
		(%)	(%)	
Both hand	Present	137(68.5)	63(31.5)	146.32*
(L+R)	Absent	19(9.5)	181(90.5)	
Note: * p<0.05				

Table 3: Distribution of hypothenar pattern between the autistic participants and control group.

Dermatoglyphic traits were already proven its potential for autism identification [8]. As the other frequently used dermatoglyphic traits, hypothenar patterns were also found to have a strong etiology of chromosomal aberrations [9]. Earlier studies reported that the hypothenar pattern got increased among the palms of trisomy 21 and trisomy 13[10-14]. The present study also found a similar feature of having hypothenar patterns frequently in the palms of autistic males (Table 1), autistic females (Table 2) and also combining both (Table 3) than that of the control of the linguistic group.

CONCLUSION

Dermal ridges and ridge patterns are highly heritable, durable, and age-independent human traits. The skin and brain (neural tissue) develop from the same ectoderm, and dermatoglyphic markers may provide specific information about early brain development unusual dermatoglyphic traits played an essential role in understanding the neurodevelopmental imbalances or the alteration of brain growth, which were well-documented worldwide. Therefore, the present study revealed the presence of hypothenar patterns as a dermatoglyphic trait that can be taken as an additional feature for the prognosis of autism.

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