

Original Research Paper

Hand Index and Psychiatric Illness

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Abstract

The shape of the hand has been considered as an important criterion in the study of palmistry and other related sciences since ancient times. A scientific measurement of the shape of the hand can be achieved by calculating its breadth and length, taking into consideration its various landmarks. Previous workers have studied the various measurements related to the human hand and have pointed out significant association with various diseases. However, such studies are few in number. Hand index is found to be an important tool in determination of nature, personality, predisposition to certain diseases, and many other unique points about an individual. The current study was conducted in the Outpatient Department of Psychiatry of the Himalayan Institute Hospital, Dehradun. The hand index of patients with psychiatric illness was studied and the results were compared with a control group. An effort was made to find out whether there is any correlation between dimensions of the hand and presence of psychiatric morbidity of an individual.

Key Words: Hand Index, Psychiatric illness, Dehradun

Introduction:

Various indices are used to determine race and sex of an individual. However, there are few indices which are used to determine the nature and personality of individual, predisposition to certain disease, etc. Hand index is one such index. It is ratio between the 'hand width' (i.e. Maximum palm width) and the 'hand length' (i.e. the distance between the tip of the middle finger and the distal wrist crease). It is also observed that Hand Index changes with age. The present study was carried out with the objective of finding an association between hand-index and psychiatric morbidity.

Materials and Methods:

The study was conducted as a part of Short Term Research Project at the Himalayan Institute of Medical Sciences. The Hand index of patients of psychiatric illness, received in the outpatient Department of Psychiatry of the Himalayan Institute Hospital, Dehradun was studied and compared with a control group. Total 50 subjects (25 Psychiatric patients and 25 Control) were included.

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The psychiatric patients in age group of 18- 60 years, capable of providing informed consent, were included in the study. However, violent/ uncooperative patients, patient with mental retardation and patients who cannot provide consent were excluded. The data obtained was statistically analysed to find out any significant correlation.

Observations and Results:

A total of 50 subjects (25 Psychiatric patients and 25 Control) between age group of 18-60 years were studied. Patients with mental retardation and those who cannot provide consent were excluded. The statistical analysis was done to find out mean, standard deviation and statistical significance.

The Mean hand index was found to be 48.64cm in the psychiatric patients compared to 44.23cm in Controls. This was found to be significantly different among the psychiatric patients as compared to the control group ($p < 0.001$, $df = 48$, $t = 4.530$). This observation points to a definite association between the hand index and psychiatric illness. (Table1)

Discussion:

Various studies suggest that hand dimensions are the result of hormonal influences. Sex hormones regulate genes, which are responsible for chondrocyte proliferation and growth of digits. The second digit in males is shorter than fourth digit, but in females second digit is of same length or longer than the fourth digit. Low 2D:4D ratio reflects embryonic exposure to high level of testosterone. [1]

Studies also prove correlation between hand dimensions and sex linked behaviours, altruism music aptitude and various illnesses including prostate cancer, anxiety, etc. [2-5]

To our knowledge, this was the first study on the association between hand index and psychiatric illness. But correlation between hand parameters and psychological disorder has been done by few researchers.

Kornhuber et al conducted a study on Second and Forth digit ratio (2D:4D) in Alcohol Dependent Patients and observed that alcohol dependent patients had smaller 2D: 4D ratios compared to controls with preserved sexual dimorphism but with reduced right-left differences.

The diagnostic accuracy is highest for right hand in males followed by the left hand in males, right hand in females and left hand in females. [6]

Bailey et al observed that males with lower finger length ratios had significantly higher physical aggression scores. However, finger length ratio did not predict anger, hostility, or verbal aggression in both sexes. [7]

Hanoch et al studied Second and Forth digit ratio (2D:4D) and impulsivity in Offenders and Non-offenders. It was found that offenders exhibited smaller right hand digit ratio measurement compared to non-offenders.

In this study multi-step correlation analysis was done and it was finally observed that marginal significant correlation between 2D:4D ratio measurement and impulsivity scores.

However, within the groups, a significant correlation was found among offenders. This study therefore, emphasized the importance of studying the relationship between biological markers, impulsivity and criminal behaviour. [8]

Very few studies suggest direct correlation between hand parameters and psychiatric illness. Shamir et al studied biometric parameters of hand as an index of Schizophrenia. 38 patients with schizophrenia and 42 controls were graded on 13 parameters having relation with mental health issues.

It was concluded that schizophrenics had higher values than control in 3 out of 13 parameters (Proximal inter-phalangeal joint, Low

transverse line and Eponychium of the middle finger). [9] Bruin et al observed that males with autism/Asperger syndrome had a significantly lower 2D:4D ratio than males with anxiety disorders. Similarly, males with attention deficit–hyperactivity disorder (ADHD)/oppositional defiant disorder (ODD) showed a significantly lower ratio than the group with anxiety disorders. [10]

The current study corroborates with the general principle of earlier studies and shows that this principle can be extrapolated to mental illnesses also.

Conclusions:

The current study has shown significant difference between the hand indices of psychiatric patients and the control group (p <0.001, df= 48, t= 4.530). However, the present study was a short term research project where a small sample size was studied to find a correlation between hand index and psychiatric illness. In addition, mentally retarded patients who cannot provide consent had also been excluded. So, the authors suggest further study with a larger sample size for increased accuracy and reliability.

References:

1. Zhengb Z, Cohn MJ. Developmental basis of sexually dimorphic digit ratios. PNAS. 2011 Sep; 108 (39): 16289-94.
2. Evardone M, Alexander GM. Anxiety, sex-linked behaviors, and digit ratios (2D:4D). Arch Sex Behav. 2009 Jun; 38(3):442-55.
3. Garza PB, Kovářík J, Neyse L. Second-to-Fourth Digit Ratio Has a Non-Monotonic Impact on Altruism. PLOS One. 2013 Apr; 8(4): e60419.
4. Borniger JC, Chaudhry A, Muehlenbein MP. Relationships among musical aptitude, digit ratio and testosterone in men and women. PLOS One. 2013 March; 8(3):e57637.
5. Rahman AA, Lophatananon A, Brown SS, Harriss D, et al. Hand pattern indicates prostate cancer risk. British Journal of Cancer. 2011; 104: 175-7.
6. Kornhuber J, Erhard G, Lenz B, Kraus T, et al. Low digit ratio 2D:4D in alcohol dependent patients. PLOS One. 2011 Apr; 6(4):e19332.
7. Bailey A, Hurd P. Finger length ratio (2D:4D) correlates with physical aggression in men but not in women. Biological Psychology. 2005; 68 (3): 215–222.
8. Hanoch Y, Gummerum M, Rolison J. Second-to-fourth digit ratio and impulsivity: A comparison between offenders and non-offenders. PLOS One. 2012; 7(10): e47140.
9. Shamir EZ, Cassan SM, Levy A, Lifshitz T, Tarrasch R. Biometric parameters of the hand as an index of schizophrenia-A preliminary study. Psychiatric Research. 2013; 716-20.
10. Bruin E, Verheij F, Wiegman T, Ferdinand R. Differences in finger length ratio between males with autism, pervasive developmental disorder– not otherwise specified, ADHD, and anxiety Disorders. Developmental Medicine & Child Neurology 2006; 48: 962–965

Table 1
Hand Index in Psychiatric Patients and Control Cases

Hand Index	Psychiatric Illness	N	Mean	Std. Deviation	S.E. Mean	t	df	Sig. (2- tailed)
	Mental Illness	25	48.64	2.833	0.567	4.530	48	0.000
	Control	25	44.23	3.954	0.791			