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Short communication

Bracelet Creases among Twins

Ramesh Chaube[1], Soma Mallick[2], Kalpana Saini[3] and Dipak Adak[4]

[1] HIG-14, Rajeev Nagar, Tilli, Sagar, Madhya Pradesh, India
[2] Indira Gandhi Rashtriya Manav Sangrahalaya, Madhya Pradesh, India
[3] Dr. H.S. Gour University, Department of Anthropology, Madhya Pradesh, India
[4] Anthropological Survey of India, Kolkata, India

A B S T R A C T

Bracelet creases among the twins were examined. A total of 42 pairs of twins (monozygotic twins-16 pairs, dizygotic like sex twins-20 pairs and dizygotic unlike sex twins-6 pairs) from the states of West Bengal and Madhya Pradesh of India were studied for this purpose. High discordance value in dizygotic twins in various types of bracelet creases is found to be sufficient to account for the high estimates of heritability. Estimated value of heritability (0.80), however, corroborates this finding. This is indicative of major role played by genetic factors in the expression of the trait as compared to environmental factors.

Key words: *creases, bracelet area, monozygotic twins, dizygotic twins*

Introduction

The bracelet area, a junction of proximal and distal ends of palm and forearm, falls beyond the area of palmar dermatoglyphics and distinctly differs from other skin folds of the forearm. Bracelet creases extend quite predominantly towards the promotion of the palm from the stylion to the radiale point. The tendency to split is quite frequent among bracelet creases. This splitting strain on the beads is noticed both on the proximal and distal sides. Based on the direction of these splits of the beads, the creases are classified as ulnar and radial[1].

Twins have been proved to be most important tool in understanding the inheritance of different traits and the nature/nurture problem. Geneticists are always interested in twin studies because monozygotic (MZ) twins have identical genotypes and any dissimilarity, which may exists between MZ pairs must be due to the action of environment agencies, either postnatally or in utero. Usefulness of dermatoglyphic traits in twin diagnosis is well described[2]. Rife[3] used finger-ridge counts as one of the eight criteria for twin diagnosis. Scientists like Smith and Penrose[4], and Nixon[5] have devised methods for twin diagnosis based on finger ridge count. Chaube[6] and Misra[7] studied palmar, bracelet and plantar creases in twins. Chaube and Bali[1] for the first time classified bracelet creases and established the heredity nature of twins through the bracelet creases. But the work conducted by them was predominately formulation oriented. Khatoon[8] subjected bracelet creases in twin study on the basis of 100 pairs of twins and she found greater concordance among MZ twin pairs as compared to the DZ twin pairs. The particular interest of the present study is to test the mode of inheritance of bracelet creases among twins.

Material and Methods

To ascertain the inheritance of bracelet creases 42 pairs of twins have been studied. The bilateral bracelet prints have been taken from those twins. To obtain the bracelet prints method suggested by Chaube and Bali[1] was followed. After properly diagnosing the twins it was found that out of 42 pairs of twins, 16 pairs of twins were monozygotic (MZ) and the rest 26 pairs of twins were dizygotic (DZ). Out of 26 pairs of DZ twins, however, 20 were of like sex and 6 were of unlike sex twins. S. Mallick has collected the data on twins from Sagar and Bhopal district of Madhya Pradesh and Howrah district of West Bengal, India.

Chaube and Bali[1] classified bracelet creases on the basis of distal bracelet crease (D), medial bracelet crease (DM) and proximal bracelet crease (DMP). The existing

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TABLE 1a
DISTRIBUTION OF BRACELET CREASES ANGMO TWINS: MZ TWINS (n=16)

Bracelet creases		Right hand Twin pair				Left hand Twin pair			
Main types	Sub-types	a		b		a		b	
		No.	%	No.	%	No.	%	No.	%
D	D								
	Dmu	1	6.25	1	6.25	1	6.25	1	6.25
	Dmr								
	Dmupu					1	6.25	1	6.25
	Dmrpr	3	18.75	3	18.75	2	12.50	2	12.50
	Dmupr								
	Dmrpu								
	Total	4	25.00	4	25.00	4	25.00	4	25.00
DM	DM	3	18.75	2	12.50	1	6.25		
	DMpu	1	6.25	1	6.25	3	18.75	3	18.75
	DMpr	4	25.00	4	25.00	2	12.50	3	18.75
	Total	8	50.00	7	43.75	6	37.50	6	37.50
DMP	DMP	3	18.75	4	25.00	2	12.50	3	18.75
	DmrP	1	6.25	1	6.25	2	12.50		
	DmuP					1	6.25	2	12.50
	$DMPP_1$					1	6.25	1	6.25
	Total	4	25.00	5	31.25	6	37.50	6	37.50

classification[1] can be further elaborated according to different subtypes, which are as follows:

Main type »D«:

– du, dr, dumu, dumr, drmr, drmu, dumupu, dumrpu, dumupr, dumrpr, drmupu, drmrpu, drmupr, drmrpr, D, Dmu, Dmr, Dmupu, Dmrpr, Dmupr, Dmrpu

Main type »M«:

– duM, drM, duMpu, duMpr, drMpr, drMpu, DM, DMpu, Dmpr

Main type »P«:

– duMP, drMP, dumrP, drmrP, dumuP, drmuP, $duMPP_1$, drMPP, $duMPp_1u$, $drMPp_1u$, $duMPp_1r$, $drMPp_1r$, DMP, DmuP, DmrP, $DMPP_1$, $DMPp_1u$, $DMPp_1r$

Results and Discussion

Distribution of bracelet creases is shown in Tables 1a and 1b for 16 pairs of MZ twins and 26 pairs of DZ twins respectively with regards to subtypes of D, DM and DMP groups of bracelet creases. For this purpose the classification of Chaube and Bali[1] was followed.

It could be seen from Table 1a that incidence of main types DM and DMP is greater than that of main type D in MZ twins in both the hands. Sub-types Dmpr in main type D, DMpr in main type DM and DMP in DMP are preponderant in number than other subtypes. However, there exists striking bimanual variation in some of these sub-types. Distribution of sub-types Dmrpr, DM, DMpu, DMpr and Dmrp is dissimilar in two hands.

A different trend is perceptible when the distribution of bracelet creases is examined among the DZ twins (Table 1b). Main type D is represented by a single case (sub-type Dmu) only in left hand. Though the main types D, DM and DMP show a more or less similar frequency in right hand, in left hand this distribution is not even between twin pairs in main type DM. Sub-types DM, DMpu and DMpr in main type DM, and sub-types DMP and Dmup in main type DMP are preponderant in number than other sub-types. However, the trait exhibits striking bimanual variation in almost all the sub-types.

Concordance and discordance among three types of twins i.e. MZ twins, DZ like sex twins and DZ unlike sex twins could be seen from Table 2. The frequencies show a gradual rise in concordance starting from DZ unlike sex twins (33.33%) to the DZ like sex twins (57.50%) and then a marked sharp incline in MZ twins (84.38%). In case of discordance, however, a reverse trend is perceptible. The frequencies of discordance show a gradual rise starting from MZ twins (15.62%) to DZ like sex twins (42.50%) and then a marked incline in DZ unlike sex twins (66.67%). It is obvious that genetic factors are operative here. The high concordance among MZ twins could not have been achieved unless heredity was controlling the transmission of these traits of bracelet creases from parents to their offspring.

Heritability estimation

The MZ twin pairs show 84.38% concordance and 15.62% discordance in bracelet creases (Table 2), whereas the DZ twin pairs show 45.44% concordance and 56.56

TABLE 1b
DISTRIBUTION OF BRACELET CREASES AMONG TWINS: DZ TWINS (n=26)

Bracelet creases		Right hand Twin pair				Left hand Twin pair			
Main types	Sub-types	a	B	a	b				
		No.	%	No.	%	No.	%	No.	%
D	D	3	11.54	1	3.85				
	Dmu	1	3.85	2	7.69	1	3.85		
	Dmr	2	7.69	2	7.69				
	Dmupu	2	7.69	1	3.85				
	Dmrpr								
	Dmupr	1	3.85	1	3.85				
	Dmrpu	1	3.85	1	3.85				
	Total	10	38.46	8	30.77	1	3.85		
DM	DM	4	15.38	3	11.54	9	34.61	3	11.54
	DMpu	1	3.85	5	19.23	7	26.92	6	23.08
	DMpr	3	11.54			3	11.54	4	15.38
	Total	8	30.77	8	30.77	19	73.08	13	50.00
DMP	DMP	4	15.38	4	15.38	2	7.69	8	30.77
	DmrP	1	3.85	1	3.85			1	3.85
	DmuP	1	3.85	3	11.54	4	15.38	4	15.38
	DMPP1	2	7.69	2	7.69				
	Total	8	30.77	10	38.46	6	23.07	13	50.00

per cent discordance when the like sex and unlike sex twins are pooled.

Therefore, the heritability of bracelet creases is:

$$H = \frac{84.38 - 56.56}{100 - 56.56} = \frac{27.82}{34.44} = 0.80$$

The results reveal from Table 2 show that the high discordance value in dizygotic twins in various types of bracelet creases is sufficient to account for the high estimates of heritability. This further proved by the formula where the estimated value of H is higher than 0.50, which indicates that, genetic factors have a major role in the expression of the trait as compared to environmental factors.

TABLE 2
CONCORDANCE AND DISCORDANCE IN BRACELET CREASES AMONG MZ AND DZ TWINS

Twin Types	No.	Concordance (in %)	Discordance (in %)
Monozygotic Twin (MZ)	16	84.38	15.62
Dizygotic Twin (DZ) (Like Sex)	20	57.50	42.50
Dizygotic Twins (DZ) (Unlike Sex)	6	33.33	66.67
Dizygotic Twins (Like + Unlike Sex)	26	45.44	56.56

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D. K. Adak

Anthropological Survey of India, Jawaharlal Nehru Road 27, 700016 Calcutta, India
e-mail: adakdipak@gmail.com

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