

Quantitative Dermatoglyphic Indexes in Monozygotic and Dizygotic Twins

V. Angelova, M. Pirinska-Apostolu

*Department of Zoology and Anthropology, Faculty of Biology,
Sofia University "St. Kliment Ohridski"*

For the aims present research there have been tested 140 twin pairs (56 pairs monozygotic and 84 pairs dizygotic). The zygotic status was determined by a complex of somatic features as well as blood group indexes of the ABO system and Rh factor. Dermatoglyphic material was processed according to Cummins and Midlo's method [1].

There have not been observed considerable differences in quantitative indexes between the two examined groups.

Key words: ridge number, thenar corners, monozygotic and dizygotic twins.

Introduction

Researching of twins always interested scientists of different areas of science.

The method of twins allows to be analyzed the degree of influence of the hereditary factors as well as the environmental ones and their connection with different features of the organism [3]. Dermatoglyphic analysis is included as a part of the twin's method. Pappilar features are referred as multilocus hereditary features.

Quantitative dermatoglyphic indexes give the opportunity to use them when a need to settle the degree of similarity occurs [2, 4, 5]. The aim of the present research is to settle down variations of the examined indexes taken down from monozygotic and dizygotic twins, and to calculate intragroup correlation between twin pairs by the researched features.

Material and Methods

There have been investigated 140 twin pairs (56 pairs monozygotic and 84 pairs dizygotic). The zygotic status was determined by a complex of somatic features and blood group indexes of the ABO system and Rh factor. Prints from the volar surface were obtained by topographic ink.

From the present research there have been used the following quantitative features:

I. Digital features:

— ridge number of I to V finger; sum of ridge number; total ridge number

II. palmar features:

— ridge number to interdigital triradius; sum of ridge number; total ridge number; size of the corners atd; ctd; bad; adt; atb; bac

Dermatoglyphic material was treated by the means of Cummins and Midlo's method [1].

Results and Discussion

There have not been observed considerable differences in monozygotic and dizygotic groups according to the finger ridge number. The higher mean values of this feature are observed about DT of the I finger of the right hand (21.9) and the lower ones about MT of the V finger of the same hand (12.4). Slightly higher mean values according to the total and sum ridge number of the MT in addition with the DT group have been estimated (Fig. 1). The differences in palm ridge number of the two exam-

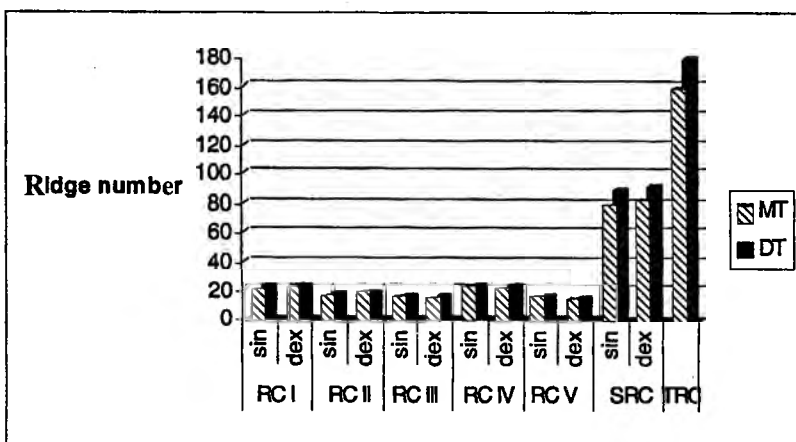


Fig. 1. Mean values of the digital ridge number

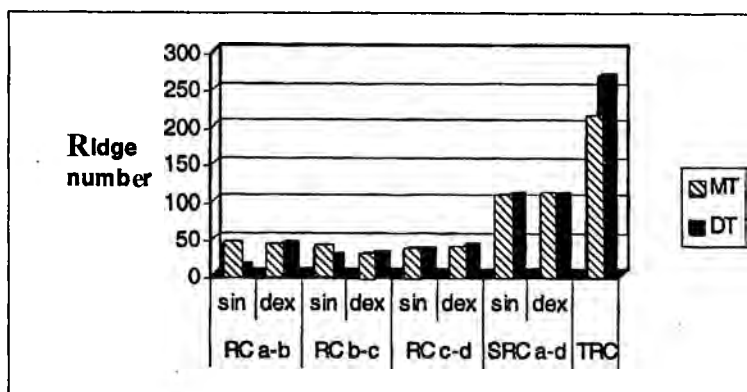


Fig. 2. Mean values of the palmar ridge number

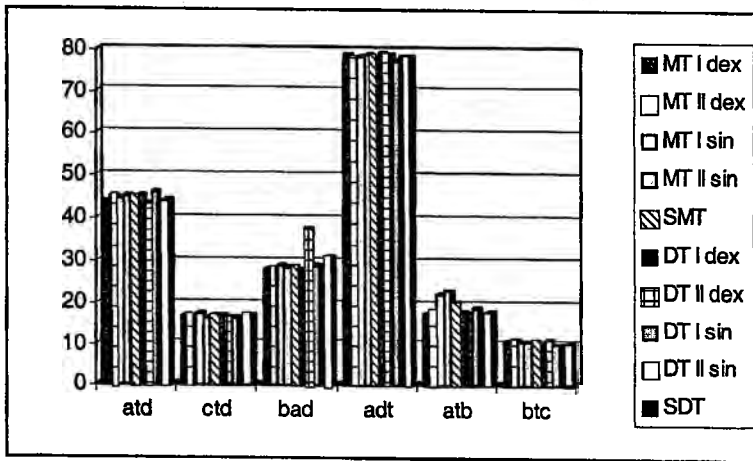


Fig. 3. Mean values of the palmar corners

ined groups are statistically insignificant. The only exception is observed about the ridge number of the interdigital triradius a-b and b-c of the left hand, where higher levels of significance are given in MT group (a-b — 40,8; b-c — 36,1) in comparison with DT group (a-b — 12,8; b-c — 26,8) (Fig. 2). After comparing the feature si of thenar corners, the two basic researched groups were divided into two basic subgroups in order of birth time. The mean values of the size of thenar corners between the compared two groups are almost the same. Differences were observed in the size

Table 1. Correlation coefficient between the ridge number of the homologous fingers in MT and DT

Features	Monozygotic twins		Dizygotic twins	
	dex	sin	dex	sin
I	0.77	0.75	0.34	0.66
II	0.84	0.74	0.21	0.17
III	0.71	0.88	0.23	0.19
IV	0.76	0.74	0.42	0.13
V	0.91	0.92	0.22	0.31

Table 2. Intergroup correlation coefficient according to the size of the palmar corner

Indexes	Order of birth time	Monozygotic twins		Dizygotic twins	
		I	II	I	II
atd	dex	0.83	0.62	0.50	0.47
	sin	0.68	0.68	0.55	0.53
ctd	dex	0.61	0.56	0.35	0.49
	sin	0.61	0.55	0.08	0.43
bad	dex	0.78	0.83	0.50	0.47
	sin	0.57	0.55	0.34	0.51
adt	dex	0.55	0.52	0.38	0.42
	sin	0.56	0.53	0.19	0.51
atb	dex	0.58	0.50	0.49	0.21
	sin	0.50	0.50	0.20	0.54
btc	dex	0.74	0.74	0.54	0.16
	sin	0.59	0.73	0.34	0.46

of the corner bad in II twin (corner bad 37.62) from DT groups (Fig. 3). The calculation of intragroup correlation between homological fingers from both hands gave the following results: in the group of monozygotic twins the estimated correlation is very high, as well as significance ($p < 0.05$). In dizygotic twins it was observed lack of correlation within the group and low correlation for I finger of the left hand (Tabl. 1).

The received data from the intragroup correlation by the size of the thenar corners confirm high levels of correlation in MT, in comparison with DT.

The highest correlation values observed are about the me, atd and bad for the right hand in the group of MT (Tabl. 2).

Conclusions

Considerable differences in the values of the quantitative dermatoglyphic indexes in MT and Dt are not observed.

There have been calculated high levels of correlation between the examined features in the group of MT and low correlation rates in the group of DT.

References

1. Cummins, H., C. Midlo. Finger Prints, Palms and Soles. New York, Dover, 1961.
2. Cantor, R. M. et al. Analysis of the covariance structure of digital ridge counts in the offspring of monozygotic twins. Genetics Society of America, 1983, 495-509.
3. Vagel, J., A. G. Motulsky. Human genetics. Москва, Мир, 1989, 275—300.
4. Дэрфлио, Р. У., Л. И. Тегако. Пальцевой гребневой счет у монозиготных и дизиготных близнецов. — Вопросы антропологии. Вып. 54, 1976, 131—140.
5. Никитюк, Б. А. Количественные показатели дерматоглифики близнецов. — Вопросы антропологии. Вып. 50, 1975, 68—83.