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NEW DERMATOGLYPHIC INVESTIGATIONS ON INFANTILE AUTISM

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Abstract. Aim. The present study resumes and completes – from a dermatoglyphic perspective – the researches on the autist syndrome on an extended sample group formed of 207 affected people (104 boys and 103 girls) – comparatively with the batch of 137 subjects (67 boys and 70 girls), analyzed in 2003 – with ages between 2.5 and 18 years. **Material and method.** A total number of 414 finger and palmar prints have been taken over in the Mental Health Center of Iaşi, all subjects coming from Moldova (North-East part of Romania). **Results.** Worth mentioning are the ***important modifications in the frequency of some palmar distortions, bearing deep pathological significance,*** more exactly either an increased (A^R, Co and the transverse palmar sulcus) or a decreased (reduced a-b and dense network of the ridges from Thenar/I) occurrence of theirs. Also, in the 2008 series, the weight of many of the distortions evidenced is higher, for all the three possible positions of disposition in their carriers, and especially for the bilateral one, which suggests doubling of the pathological charge at the palm level in the actual series of autistst. As to ***the sexual dimorphism and bilateral differences in the distributions of palmar anomalies,*** however, the ***two series of autists show an unitary behaviour,*** the A^R, L^U, T_{11}+T_{12}, reduced a-b, Cx and transverse palmar sulcus distortions being more frequent in boys, while tt't'', the dense network from Th/I, Co and t_0 – in girls; also, L^U, t_0, T_{11}+T_{12}, Cx, Co and transverse palmar sulcus are more frequently occurring on the left hand, whereas A^R, tt't'', the dense network from Th/I and the reduced a-b – on the right one. More than that, in both groups of autists (of 2008 and, respectively, 2003), the percent values recorded for all palmar distortions under analysis are considerably different from that of the reference, which is another proof that the either genetic or teratologic causal factors involved in the development of infantile autism have been active in the first 3-5 months of intrauterine life, when the epidermal papillary ridges are also finalized. **Conclusions.** The results obtained are contributing to a better knowledge of the indices of dermatoglyphic diagnosis of the autist syndrome. They may be also employed as reference data for a precocious tracing of this severe malady, at least in the region of Moldova (North-East România) from which the affected people come.
Key words: palmar dermatoglyphics, pathology, distortions or anomalies, infantile autism

Rezumat. Scop. Studiul de faţă reprezintă o revenire asupra Sindromului autist, din perspectivă dermatoglifică, pe un eşantion lărgit de 207 afectaţi (104 B şi 103 F) faţă de cel studiat în 2003 de 137 subiecţi (67 B şi 70 F), de vârstă cuprinsă între 2,5 şi 18 ani. **Material şi metodă.** Au fost recoltate la Centrul de Sănătate Mintală Iaşi, un număr de 414 amprente digito-palmare, toţi subiecţii provenind din Moldova (partea de Nord-Est a României). **Rezultate.** Se constată ***însemnate modificări ale frecvenţei unora dintre distorsiunile palmare cu semnificaţii patologice profunde***, fie în sensul creşterii ei (A^R, Co şi Sulcusul palmar transvers), fie al scăderii (a-b redusă şi reţeaua densă a crestelor din Th/I). De asemenea, la seria din 2008 are loc o ***creştere a ponderii multora dintre distorsiunile***

semnalate, pentru toate cele trei poziții posibile de dispoziție a lor la purtători, dar mai ales pentru cea bilaterală, care sugerează o dublare a încărcăturii patologice de la nivelul palmei seriei actuale de autişti. Cât priveşte ***dimorfismul sexual şi diferențele bilaterale în repartiția anomaliilor palmare*** însă, cele două serii de autişti prezintă un comportament unitar, distorsiunile A^R, L^U, $T_{11}+T_{12}$, a-b redusă, Cx şi Sulcusul palmar fiind mai frecvente la baieți iar tt't'', rețeaua densă din Th/I, Co şi t_0 dimpotrivă la fete după cum L^U, t_0, $T_{11}+T_{12}$, Cx, Co şi Sulcusul palmar se întâlnesc mai des pe mâna stângă iar A^R, tt't'', rețeaua densă din Th/I şi a-b redusă pe mâna dreaptă. În plus, la ambele grupe de autişti (din 2008 şi 2003) procentajele înregistrate de toate anomaliile palmare semnalate se distanțează semnificativ de ale lotului martor, ceea ce ne demonstrează o dată în plus că factorii cauzali implicați în dezvoltarea autismului infantil, fie ei de natură genetică sau teratologică, au acționat în primele 3-5 luni de viață intrauterină când se definitivează şi crestele papilare epidermale. **Concluzii**. Rezultatele obținute sunt o contribuție la o mai bună cunoaştere a indicatorilor de diagnoză dermatoglifică a Sindromului autist. Ele vor putea servi ca date de referință în depistarea precoce a acestei grave maladii cel puțin în zona Moldovei (Nord-Estul României) din care provin afectații.
Cuvinte cheie: dermatoglife palmare, patologie, distorsiuni sau anomalii, autism infantil

INTRODUCTION

Resuming the investigations on pathological dermatoglyphics, initiated and developed by the author as early as 1991, the present study goes deeply into the autist syndrome, first approached in 2003, on a number of patients subjected to dermatoglyphic analysis in the Center of Mental Health of Iaşi of only 137 (67 boys and 70 girls), the result being published in the journals of the field (12, 13).

Even if the results largely agreed with the literature data provided in foreign publications, obtained on other European batches of autists (1, 3, 4, 6, 7, 8), the fact that, in Romania, the autism has been analyzed for the first time from the perspective of the dermatolgyphic pathology, explains the decision of the author of resuming the investigations on a group of persons not only better statistically represented (207 patients) but also more balanced from the viewpoint of the multiple forms in which the malady may be manifested – namely, from the simplest and partially or totally recoverable (1, 3, 6, 18, 19), up to the most severe ones (5, 8, 16, 17).

MATERIALS AND METHOD

Along several years, in the Center of Mental Health of Iaşi, there have been dermatoglyphically investigated, besides the 137 autists of 2003, an additional number of 70 subjects, *i.e.,* a total number of 207 (104 boys and 103 girls), all from Moldova, with ages between 2.5 and 18 years, from which 414 finger and palmar prints were collected.

As evidenced by the medical certificates of the patients, in most of the cases autism was associated with severe mental deficiency (SMD) with a QI value below 34, with dislexy, double incontinence and anxiety; in about half of them, the malady was accompanied by moderate mental deficiency (MMD), hypoacusy, enuresis while, in a few subjects, epilepsy was also present, besides MMD and enuresis.

Consequently, about 75% the autists under study were included, by the Expert Commission of the handicap degree from the Iaşi Center of Mental Health, in the first degree of invalidity, which assumes an advanced physiological and neuropsychic degeneration, correlated – as demonstrated in the following – with an ample pathological charge of the palm's dermatoglyphic picture - which is actually the topic of the present study.

For all palmar dermatoglyphic anomalies or distortions put into evidence, the sexual dimorphism, the bilateral differences as well as their uni- or bimanual disposition in carriers were considered, which permitted an estimation of the affection degree of the sample, from this perspective.

Also, the results obtained were compared with those from the 2003 series and both of them – with the values recorded in the apparently normal population of Moldova – wherefrom all the affected people come, once known that, at batch level, the dermatoglyphic anomalies are but deviations in the frequency of some digito-palmar characteristics from the values existing in the apparently normal population (12, 13, 9). The working methods applied are those currently used in studies of populational pathological dermatoglyphics (2, 4, 8, 10).

RESULTS AND DISCUSSION

Table 1 show the percent distribution values – as a function of sex, laterality and on the whole – of the palmar distortions or anomalies evidenced in the 2008 and 2003 series of autists, comparatively with the reference batch of Moldova.

Mention should be made of the fact that, by increasing the number of affected people up to a total of 207, significant modifications occurred in the frequency of some palmar distortions, known as bearing grave pathological significance (8, 10). Thus, ***the radial arc from the Hypothenar (A^R)***, the weight of which in the reference is only of 0.50% while in other apparently normal populations does not exceed 0.83% (2, 9, 15) increased from 2.55% in 2003 to 6.52% in 2008, a higher amplitude being observed in boys, comparatively with girls (*i.e.,* + 4.87% *versus* + 2.99%). Also, ***the total suppression of the C line (Co) course and the transverse plmar Sulcus,*** extremely rare ridge formations, with well-known clinical implications (2, 4, 7, 8, 11, 14) increased, on the average, with + 2.74% and, respectively +2.71% in the 2008 group, comparatively with the 2003 one, which is quite a high value, if considering their much reduced incidence in the apparently normal populations and thus, implicitly, in the reference group (9, 15).

As to the distortions referring to ***a reduced distance between triradia a and b much under the average value recorded in the Romanian population,*** of 21 mm in girls and of 24 mm, respectively, in boys (15) ***as well as to the arrangement of the papillary ridges from the Th/I areal as a dense or very dense network, instead of their curving in radial direction***, one may observe, on the contrary, a sensible diminution of their weight in the 2008 series, comparatively with the 2003 one, of

−9.26% and, respectively, −7.57%. In both cases, the diminution is more ample (with 11.29%) in the series of girls, *versus* a value of −7.45%, recorded in boys, for the a-b distance, and with −10.0% and, respectively, −4.37%, for the dense network in Th/I.

As to the remaining palmar distortions here mentioned, namely $T_{11}+T_{12}$, t_0, tt't'', L^U and Cx, the amplitude of the differences observed between the present and the 2003 batch is quite limited, ranging between a minim of −0.10% for anomaly $T_{11}+T_{12}$ and of +1.57% for Cx, which can be rather accidental and not the result of sampling.

Even if, for the 5 last-mentioned anomalies, no considerable differences are observed between the two series of autists, their presence in the case of the other 5 above-analyzed ones demonstrates the importance of utilizing a higher number of affected people in the 2008 series.

Analysis of ***the distribution of the 10 palmar distorsions as a function of sex and laterality*** – listed in the same Table 1 – evidences the same tendency in both series of autists, a tendency agreeing, in most cases, with the one manifested in the reference. Thus, in both series of autists, higher values occur in boys – than in girls – for anomalies A^R, L^U, $T_{11}+T_{12}$, the reduced a-b distance, Cx and the palmar sulcus, while the series of girls show higher percent values for: tt't'', t_0, dense network of ridges from Th/I and Co. Also, in both groups of autists (2008 and 2003), distortions L^U, t_0, $T_{11}+T_{12}$, Cx, Co and the transverse palmar sulcus are more frequently occurring on the left palm of the affected people, A^R, tt't'', etc., and reduced a-b – on their right hand, while the arrangement of the papillary ridges from Th/I as a dense network appears in quite close percent values on both palms. Worth mentioning here is the fact that, ***as to the magnitude of the percent values registered for the 10 palmar distortions***, both the 2008 and the 2003 series are significantly different from the reference, which suggests that the causal (either genetic or teratological) factors involved in the development of the malady and, implicitly, in the occurrence of such distortions – as either sketches or signals of it – have acted in the early stages of the prenatal life of the affected people, when the epidermal papillary ridges get finalized. As to ***the disposition of the palmar distortions in their carriers*** (listed in table 2), individual analysis of the dermatoglyphic files evidenced that, with only a few exceptions, the 2008 group of autists shows similar tendencies with the 2003 one; more precisely, in both cases, out of the 10 anomalies, t_0, $T_{11}+T_{12}$, Cx, Co and the transverse palmar sulcus record the highest percent values for their exclusive occurrence on the left hand of the affected people, others (A^R, L^U, tt't'', etc)., for their exclusive presence on the right hand, and the dense network of the ridges from Th/I and the much reduced a-b distance – for their bilateral disposition.

Table 1. Percent distribution, according to hand and sex, of the palmar dermatoglyphic distortions in the 2 series of autists (2008 and 2003), comparatively with the reference sample

Palmar distortions	Autists+ Reference	Boys			Girls			Total		
		L	R	L+R	L	R	L+R	L	R	L+R
A^R from Hp	2008	3.84	10.58	7.21	-	11.65	5.85	1.93	11.11	6.52
	2003	-	4.47	2.24	-	5.71	2.86	-	5.11	2.55
	Reference	-	1.00	0.50	-	1.00	0.50	-	1.00	0.50
L^U from Hp	2008	9.61	11.54	10.57	8.74	4.85	6.80	9.17	8.21	8.69
	2003	10.45	13.43	11.95	10.00	5.71	7.86	10.22	9.48	9.85
	Reference	1.00	2.00	1.00	3.00	1.00	2.00	2.00	1.50	1.75
tt't'', etc.	2008	22.11	34.61	28.36	30.10	38.83	34.47	26.08	36.71	31.40
	2003	22.39	32.83	27.62	32.86	40.00	36.42	27.74	36.49	32.11
	Reference	15.00	16.00	15.50	16.00	17.00	16.50	15.50	16.50	15.75
t_0	2008	3.85	1.92	2.88	9.71	4.85	7.28	6.76	3.38	5.07
	2003	2.98	1.49	2.24	10.00	4.28	7.14	6.57	2.92	4.75
	Reference	-	-	-	-	-	-	-	-	-
$T_{11}+T_{12}$	2008	38.46	24.04	31.25	28.15	30.09	29.12	33.33	27.05	30.19
	2003	41.80	22.40	32.10	30.00	27.14	28.57	35.77	24.82	30.29
	Reference	5.00	2.00	3.50	7.00	4.00	5.50	6.00	3.00	4.50
Dense and very dense network in Th/I	2008	25.00	25.96	25.48	47.57	49.51	48.54	36.23	37.68	36.95
	2003	29.85	29,85	29.85	61.43	55.71	58.57	45.98	43.06	44.52
	Reference	3.00	5.00	4.00	5.00	7.00	6.00	4.00	7.00	5.00
a-b distance <21mm in G and 24mm in B	2008	55.76	58.25	56.73	44.66	45.63	45.14	50.24	51.69	50.96
	2003	61.19	67.16	64.18	55.71	57.14	56.43	58.39	62.04	60.22
	Reference	11.00	13.00	12.00	9.00	12.00	10.50	10.00	12.50	11.25
Cx	2008	39.42	34.61	37.02	33.01	32.03	32.52	36.23	33.33	34.78
	2003	37.31	35.82	36.56	32.86	27.14	30.00	35.03	31.38	33.21
	Reference	14.00	8.00	11.00	7.00	3.00	5.00	10.50	5.50	8.00
Co	2008	8.65	4.81	6.73	14.56	7.76	11.16	11.59	6.28	8.94
	2003	4.48	2.98	3.75	10.00	7.14	8.57	7.29	5.11	6.20
	Reference	3.00	2.00	2.50	5.00	2.00	3.50	4.00	2.00	3.00
Transverse palmar sulcus	2008	16.35	12.50	14.42	14.56	3.88	9.22	15.46	8.21	11.83
	2003	11.94	11.94	11.94	10.00	2.86	6.43	10.95	7.30	9.12
	Reference	3.00	1.00	2.00	1.00	1.00	1.00	2.00	1.00	1.50

2008 : 104B – 103G
2003 : 67B – 70G
Reference : 100B – 100G

Table 2. Frequency of palmar distortions arrangement in their carriers

Palmar distortions	Autists	Only on the left hand	Only on the right hand	On both hands	Total carriers
A^R from Hp	2008	-	16 :17=94.12	1 :17=5.88	17 :207=8.21
	2003	-	7 :7=100	-	7 :137=5.11
L^U from Hp	2008	13 :32=40.62	14 :32=43.75	5 :32=15.62	32 :207=15.46
	2003	11 :24=45.83	11 :24=45.83	2 :24=8.33	24 :137=17.52
tt't'', etc.	2008	22 :99=22.22	45 :99=45.45	32 :99=32.32	99 :207=47.83
	2003	17 :67=25.37	29 :67=43.28	21 :67=31.34	67 :137=48.90
t_0	2008	9 :16=56.25	2 :16=12.50	5 :16=31.25	16 :207=7.73
	2003	10 :19=52.63	7 :19=30.84	2 :19=10.53	19 :137=13.87
$T_{11}+T_{12}$	2008	35 :91=38.46	23 :91=25.27	33 :91=36.26	91 :207=43.96
	2003	26 :60=43.33	11 :60=18.33	23 :60=38.33	60 :137=43.79
Dense and very	2008	11 :89=12.36	15 :89=16.85	63 :89=70.79	89 :207=43.0
dense network in Th/I	2003	9 :68=13.23	10 :68=14.70	49 :68=72.06	68 :137=49.63
a-b distance <21mm	2008	21 :128=16.41	24 :128=18.75	83 :128=64.84	128 :207=61.83
in G and 24mm in B	2003	10 :95=10.52	15 :95=15.78	70 :95=73.68	95 :137=69.34
Cx	2008	37 :108=34.25	33 :108=30.55	38 :108=34.18	108 :207=51.69
	2003	23 :67=34.33	19 :67=28.35	25 :67=37.31	67 :137=48.90
Co	2008	16 :29=55.17	5 :29=17.24	8 :29=27.58	29 :207=14.00
	2003	8 :15=53.33	5 :15=33.33	2 :15=13.33	15 :137=11.00
Transverse	2008	19 :35=54.28	5 :35=14.28	11 :35=31.43	35 :207=16.91
palmar Sulcus	2003	10 :20=50.00	4 :20=20.00	6 :20=30.00	20 :137=14.60

Nevertheless, considering ***the magnitude of the percent values of the 10 palmar distortions for each of the 3 possible dispositions in carriers***, Table 2 shows increased values for the 2008 autist series for 6 distortions in the case of bilateral disposition (A^R, L^U, tt't'', t_0, Co and Sulcus), for 5 of them (tt't'', $T_{11}+T_{12}$, dense network from, Th/I reduced a-b distance and Cx), in the case of their exclusive occurrence on the right hand of the affected subjects, and for 4 (t_0, reduced a-b, Co and Sulcus), as to their exclusive presence on the left palm. Such a higher frequency in many of the distortions signaled out in the present series of autists, both for their exclusive presence on one palm or another and, especially, for their simultaneous occurrence on both hands of the carriers expresses – in a most suggestive manner – an amplification of the pathological charge of the palmar picture in the 2008 series, comparatively with the 2003 one, which is the result of the higher number of subjects under investigation, correlated – as well – with the complex clinical picture of the diseases affecting many of them.

CONCLUSIONS

Study of the pathology of dermatoglyphics in patients suffering from infantile autism – in the variant of an increased number of subjects, *i.e.,* from 137 in 2003 to 207 in 2008 – put into evidence important modifications – namely, increases – in the frequency of some dermatoglyphic distortions, bearing deep clinical significance for their carriers, comparatively with the 2003 batch (A^R from Hp, Co the transverse palmar sulcus) and, especially, with the reference batch of Moldova. In terms of other anomalies such as the dense network of ridges from Th/I and reduced distance between triradia a and b much under the average values characterizing the Romanian population, a lower frequency of theirs should be observed in the 2008 series also, in the other 5 anomalies – from the total number of 10 -, the amplitude of the differences recorded is quite limited, ranging between −0.10% (for $T_{11}+T_{12}$) and +1.57% (for the palmar sulcus).

A more ample pathological charge of the palmar picture in the 2008 series of autists – comparatively with the 2003 one – is suggestively illustrated, nevertheless, by the increased percent values recorded by the three possible dispositions of the palmar distortions in their carriers, most of them referring to those with bilateral disposition (A^R, L^U, tt't'', t_0, Co and Sulcus), in 5 anomalies – for their exclusive occurrence on the right hand and in 4 – for their exclusive presence on the left hand (Table 2). All these observations fully agree with the multitude of complex forms in which the autist syndrome is manifested in many of the subjects under investigation, with an advanced invalidity degree – as established by the Expert Commission of the Mental Health Center.

However, as ***to the distribution of palmar distortions signaled out as a function of sex, laterality and disposition mode – on either one or on both hands*** – the two series of autists show similar tendencies, many of them agreeing with those of the reference group of Moldova, which demonstrates that the two autist series come from the same apparently normal population of this region.

To conclude with, most part of the results obtained, agreeing fully with the ones registered for other European group of autists, might contribute to a better knowledge of the indices of dermatoglyphic diagnosis of the autist syndrome, to be further employed as reference data for a precocious tracing of the malady at populational level (at least in the region of Moldova), while the distortions as such might serve as **"markers"** for an early detection of the persons risking to be affected by such a largely occurring, dangerous disease.

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