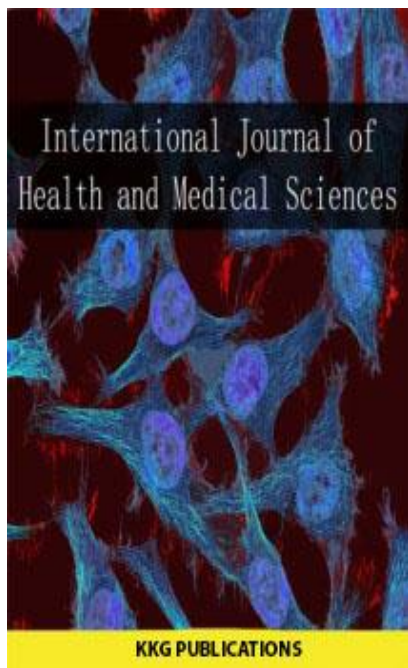


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SERGII KULISHOV ¹, OLEXANDR IAKOVENKO ²

¹ Higher State Educational Institution of Ukraine, Ukrainian Medical Stomatological Academy, Poltava, Ukraine

² V.P. Komissarenko Institute of Endocrinology and Metabolism AMS Ukraine Kyiv, Ukraine

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DIFFERENTIAL DIAGNOSIS OF DERMATOGLYPHIC PECULIARITIES IN THE PATIENTS WITH CORONARY HEART DISEASE AND CHRONIC KIDNEY DISEASE

SERGII KULISHOV ^{1*}, OLEXANDR IAKOVENKO ²

¹ Higher State Educational Institution of Ukraine, Ukrainian Medical Stomatological Academy, Poltava, Ukraine

² V.P. Komissarenko Institute of Endocrinology and Metabolism AMS Ukraine Kyiv, Ukraine

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Abstract. Prediction genetically predisposed people to heart and kidney failure is an actual problem. Dermatoglyphics can be one of the basic research in this area. The purpose of the study was to determine the features of dermatoglyphics in the patients with coronary heart disease and chronic kidney disease with chronic renal failure for making differential diagnosis. The object of the study were 25 patients (45-77 y.o.) with chronic coronary heart disease and 20 patients (42.65 ± 0.71 y.o.) with chronic kidney disease. Investigation and treatment of the patients was carried out in accordance with the standards. Dermatoglyphic study was conducted by the method of fingerprinting surfaces phalanges, using paint. Statistical methods of evaluation findings included parametric and non-parametric statistical methods. Results. The prevalence of ulnar loops on fingers of right hand was typical feature for patients with chronic kidney disease and radial loops on fingers of right hand for patients with coronary heart disease. The predominance of racemates from ulnar loops scallops on the left and right hands was a distinctive sign for the patients with chronic kidney disease in compare to the patients with coronary heart disease. Dissymmetry of scallops in the patients with coronary heart disease was characterized by predominance of radial loops on fingers of right hand in compare with left; predominance of ulnar loops on fingers of left hand in compare with right. Thus, quantity of different types of scallops, their dissymmetry or racemates on fingers of the left and right hands are basis for differential diagnosis between patients with coronary heart disease and chronic kidney disease.

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INTRODUCTION

At present within the pathology of cardiovascular and urinary systems is determined according to the data of genetics [1], [2], [3], [4], epigenetics. Genetic susceptibility to coronary heart disease (CHD) is claimed to account for 50% of predisposition [1], [2], [3]. The challenge of preventing CHD will require a more comprehensive prevention and treatment of environmental and genetic risk factors [1]. Genetic screening and new therapeutic targets are becoming available to manage both genetic and environmental risk factors for CAD [1]. Prediction genetically predisposed people to heart and kidney failure is an actual problem. Special attention is given to the use of dermatoglyphics as accessible and informative methods of research [4]. The purpose of the study was to determine the features of dermatoglyphics in the patients with coronary heart disease and chronic kidney disease (CKD) with chronic renal failure for making differential diagnosis.

MATERIAL AND METHOD

The objects of the study were 25 patients with coronary heart artery disease. 3 (52%) patients from 25 had stable angina II-III function-

al class. 12 (48%) patients had coronary artery disease in the form of diffuse atherosclerosis with heart failure, arrhythmias and conduction disturbances. Essential hypertension (EH) II stage was concomitant disease in 19 (80%) patients from 25.5 (20%) had EH III stage. In 16 (64%) patients from 25 were identified arrhythmias and cardiac disturbances.

In 24 (96%) patients from 25 chronic heart failure was observed. Age of the patients was 45-77 y.o., 17 (68%) males and 8 (32%) females. Examination and treatment of patients was carried out in accordance with the standards. Dermatoglyphic study was conducted by the method of fingerprinting surfaces phalanges, using paint [5].

Dermatoglyphic Peculiarities

The objects of the study were 20 patients with chronic kidney disease (CKD). 18 (90%) patients from 20 were on prolonged dialysis. In 8 (40%) were diagnosed secondary chronic pyelonephritis, latent course; 10 (50%) had chronic glomerulonephritis, 2 (10%) - systemic lupus erythematosus (SLE)

*Corresponding author: Sergii Kulishov

E-mail: kulishov@meta.ua



and .lupus nephritis. Arterial hypertension (AH) II stage, very high risk was in 13 (65%) patients from 20 and AH III stage in 1 (5%). II functional class (FC) of chronic heart failure (CHF) by the New York Heart Association (NYHA) was observed in 11 (55%)

patients from 20; 7 (35%) - III FC. Age investigated – 42.65 ± 0.71 ; 7.96 ; $57.93-60.74$ ($M \pm SEM$; SD ; $95\% CI$), maximum-61, minimum-21 years and 7 (35%) men, and 13 (65%) women.

Dermatoglyphic Peculiarities

TABLE 1

INDICATORS OF HAND FINGERS SCALLOPS IN THE PATIENTS WITH CORONARY HEART DISEASE AND CHRONIC KIDNEY DISEASE

The object of the study – fingerprinting surfaces phalanges of superior extremities (R – right and L - left)	Groups of investigation	Types of hand fingers scallops					Asymptomatic significance (2-sided)	
		indistinct	Lu	Lr	W	A	Pearson chi-square	Likelihood Ratio
1	2	3	4	5	6	7	8	9
R1/L1	Patients with chronic kidney disease, n=20	1/0	15/12	0/3	4/4	0/1	0,0001 for R1	0,0001 for R1
	Patients with coronary heart disease, n=25	0/0	1/16	13/2	8/6	3/1		
R2/L2	Patients with chronic kidney disease, n=20	0/0	12 /7	0/0	6/6	2 /7	0,003 for R2	0,001 for R2
	Patients with coronary heart disease, n=25	0/0	3/6	5/0	9/11	8/8		
R3/L3	Patients with chronic kidney disease, n=20	0/0	17 /12	0/2	2/2	1 /4	0,0001 for R3	0,0001 for R3
	Patients with coronary heart disease, n=25	1/0	0/12	9/1	9/6	6/6		
R4/L4	Patients with chronic kidney disease, n=20	0/0	12 /12	0/0	7/5	1 /3	0,0001 for R4	0,0001 for R4
	Patients with coronary heart disease, n=25	3/0	1/13	7/0	12/9	2/3		
R5/L5	Patients with chronic kidney disease, n=20	0/0	16 /14	0/1	3/3	1 /2	0,0001 for R5	0,0001 for R5
	Patients with coronary heart disease, n=25	3/0	0/17	14/1	5/2	3/5		
Summarized data (R1+ R2+ R3+ R4+ R5) / (L1+L2+L3+L4+L5)	Patients with chronic kidney disease, n=20	1/0	72 /57	0/6		5 /17		
	Patients with coronary heart disease, n=25	7/0	5/64	48/4	43/34	22/23		
Summarized data (R+L)	Patients with chronic kidney disease, n=20	1	129	6	42	22		
	Patients with coronary heart disease, n=25	7	69	52	77	45		

Examination and treatment of patients was carried out in accordance with the standards. Dermatoglyphic study was conducted by the method of fingerprinting surfaces phalanges, using paint [5].

Statistical methods of evaluation findings included parametric and non-parametric statistical methods (IBM SPSS

Statistics 22.00, “Statistica for Windows Release 5.1”, 1984-1998 StatSoft, Inc.).

RESULTS

The predominance of ulnar loops on the first finger of right hand was a characteristic feature for 13 (80%) from 20

patients with chronic kidney disease ($p=0.05$ according to sign test), while for patients with coronary heart disease, same changes have been in 1 (4%) from 25 ($p=0.00001$ according to accurate Fisher test) (table).

The predominance of radial loops on the first finger of right hand was a characteristic feature for 13 (52%) from 25 patients with coronary heart disease, while for patients with chronic kidney disease, such changes have been in 0 (0%) from 20 ($p=0.00001$ according to accurate Fisher test).

The predominance of ulnar loops on the second finger of right hand was a characteristic feature for 12 (60%) from 20 patients with chronic kidney disease, while for patients with coronary heart disease, such changes have been in 3 (12%) from 25 ($p=0.0012$ according to accurate Fisher test).

Dermatoglyphic Peculiarities

The predominance of ulnar loops on the third finger of right hand was a characteristic feature for 17 (85%) from 20 patients with chronic kidney disease ($p=0.01$ according to sign test), while for patients with coronary heart disease, such changes have been in 0 (0%) from 25 ($p=0.0012$ according to accurate Fisher test). The predominance of radial loops on the third finger of right hand was a characteristic feature for 9 (36%) from 25 patients with coronary heart disease, while for patients with chronic kidney disease, such changes have been in 0 (0%) from 20 ($p=0.0025$ according to accurate Fisher test).

The predominance of ulnar loops on the fourth finger of right hand was a characteristic feature for 12 (60%) from 20 patients with chronic kidney disease ($p=0.01$ according to sign test), while for patients with coronary heart disease, such changes have been in 1 (4%) from 25 ($p=0.00001$ according to accurate Fisher test).

The predominance of radial loops on the fourth finger of right hand was a characteristic feature for 7 (28%) from 25 patients with coronary heart disease, while for patients with chronic kidney disease, such changes have been in 0 (0%) from 20 ($p=0.0123$ according to accurate Fisher test).

The predominance of ulnar loops on the fifth finger of right hand was a characteristic feature for 15 (75%) from 20 patients with chronic kidney disease ($p=0.05$ according to sign test), while for patients with coronary heart disease, such changes have been in 1 (4%) from 25 ($p=0.00001$ according to accurate Fisher test).

The predominance of radial loops on the fifth finger of right hand was a characteristic feature for 14 (56%) from 25 patients with coronary heart disease, while for patients with chronic kidney disease, such changes have been in 1 (4%) from 20 ($p=0.0003$ according to accurate Fisher test).

Dermatoglyphic Peculiarities

The predominance of ulnar loops on all fingers of right hand was a characteristic feature for 72 (72%) from 100 scallops

in 20 patients with chronic kidney disease ($p=0.01$ according to sign test), while for 25 patients with coronary heart disease, such changes have been in 5 (4%) from 125 scallops ($p=0.00001$ according to accurate Fisher test)

The predominance of radial loops on all fingers of right hand was a characteristic feature for 48 (38.4%) from 125 scallops in 25 patients with coronary heart disease, while for 20 patients with chronic kidney disease, such changes have been in 0 (0%) from 100 scallops ($p=0.00001$ according to accurate Fisher test).

The predominance of racemates from ulnar loops scallops on the left and right hands was a characteristic feature for 16 (80%) from 20 patients with chronic kidney disease, such changes have been in 0 (0%) from 25 patients with coronary heart disease ($p=0.00001$ according to accurate Fisher test).

The predominance of radial loops on the first finger of right hand was a characteristic feature for 13 (52%) from 25 patients with coronary heart disease, while on the first finger of left hand was 2 (8%) from 25 ($p=0.0015$ according to accurate Fisher test).

The predominance of ulnar loops on the first finger of left hand was a characteristic feature for 16 (64%) from 25 patients with coronary heart disease, while such changes have been on the first finger of right hand in 1 (4%) from 25 ($p=0.00001$ according to accurate Fisher test). The predominance of radial loops on the third finger of right hand was a characteristic feature for 9 (36%) from 25 patients with coronary heart disease, while on the third finger of left hand was 1 (4%) from 25 ($p=0.0106$ according to accurate Fisher test).

Dermatoglyphic Peculiarities

The predominance of radial loops on the fourth finger of right hand was a characteristic feature for 7 (28%) from 25 patients with coronary heart disease, while on the fourth finger of left hand was 0 (0%) from 25 ($p=0.0096$ according to accurate Fisher test).

The predominance of ulnar loops on the fourth finger of left hand was a characteristic feature for 13 (52%) from 25 patients with coronary heart disease, while such changes have been on the fourth finger of right hand in 1 (4%) from 25 ($p=0.0005$ according to accurate Fisher test).

The predominance of radial loops on the fifth finger of right hand was a characteristic feature for 14 (56%) from 25 patients with coronary heart disease, while on the fifth finger of left hand was 1 (4%) from 25 ($p=0.0001$ according to accurate Fisher test).

The predominance of ulnar loops on the fifth finger of left hand was a characteristic feature for 17 (68%) from 25 patients with coronary heart disease ($p=0.05$ according to sign test), while such changes have been on the fifth finger of right hand in 0 (0%) from 25 ($p=0.00001$ according to accurate Fisher test).

The predominance of radial loops on fingers of right hand was a characteristic feature for 48 (38.4%) from 125 scallops in 25 patients with coronary heart disease, while such changes have been

on fingers of left hand in 4 (3.2%) from 125 scallops ($p=0.00001$ according to accurate Fisher test).

The predominance of ulnar loops on all fingers of left hand was a characteristic feature for 64 (51.2%) from 125 scallops in 25 patients with coronary heart disease, while such changes have been on all fingers of right hand in 5 (4%) from 125 scallops ($p=0.00001$ according to accurate Fisher test).

DISCUSSION

Dermatoglyphic patterns form in utero during early gestation and may be influenced by genetic and environmental factors operating at that time [6]. Cardiovascular embryogenesis also occurs during early gestation, so analysis of dermatoglyphics in the patients with heart diseases might reveal some types which are associated with aberrant dermatoglyphics [6].

In our investigation we have determined that quantity of different types of scallops, their dissymmetry or racemates on fingers of the left and right hands is basis for differential diagnosis between patients with coronary heart disease and chronic kidney disease.

Our data consistent with results of other investigators:

- Connection of increased frequency of loop pattern and coronary heart disease, myocardial infarction [7];
- Reduced frequency of ulnar loops, dominant whorls was typical for patients with essential hypertension [8];
- Increasing the frequency of loops and / or whorls of fourth and second fingers is the typical for patients with coronary heart disease [9];
- The predominance of whorls and /or ulnar loops in male patients with coronary heart disease, compared with an increased number of arcs in healthy persons [9];

- Typical for patients with chronic kidney failure is the prevalence of ulnar loops in compared with healthy persons [10].

Dermatoglyphic Peculiarities

Future research direction: data of genetics, epigenetics, differential geometry, and topology can be basis for development diagnostic possibilities of dermatoglyphics.

CONCLUSION

1. Quantity of different types of scallops, their dissymmetry or racemates on fingers of the left and right hands are basis for differential diagnosis between patients with coronary heart disease and chronic kidney disease.
2. The prevalence of ulnar loops on fingers of right hand was typical feature for patients with chronic kidney disease and radial loops on fingers of right hand for patients with coronary heart disease.
3. The predominance of racemates from ulnar loops scallops on the left and right hands was a distinctive sign for the patients with chronic kidney disease in compare to the patients with coronary heart disease.
4. Dissymmetry of scallops in the patients with coronary heart disease was characterized by predominance of radial loops on fingers of right hand in compare with left; predominance of ulnar loops on fingers of left hand in compare with right.
5. The features of dermatoglyphics in the patients with coronary heart disease and chronic kidney disease help us for making differential diagnosis, understanding of genetic and environmental influences.

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— This article does not have any appendix. —