International Journal of Anatomy and Research,
Int J Anat Res 2021, Vol 9(4):8160-67. ISSN 2321-4287
DOI: https://dx.doi.org/10.16965/ijar.2021.176

Original Research Article

A Study of Dermatoglyphic Patterns of Fingers in Patients with Myocardial Infarction

Arunkumar K R *[1], Delhiraj U [2], Dhanalakshmi V [3].

*[1]Associate Professor of Anatomy, Dhanalakshmi Srinivasan Medical College and Hospital, NH-45, Trichy - Chennai Road, Siruvachur – 621113, Perambalur District, Tamil Nadu, India.

[2] Assistant Professor of Anatomy, Dhanalakshmi Srinivasan Medical College and Hospital, NH-45, Trichy - Chennai Road, Siruvachur – 621113, Perambalur District, Tamil Nadu, India.

[3] Associate Professor, Department of Anatomy, Govt Thoothukudi Medical College, Tuticorin, Tamil Nadu, India.

ABSTRACT

Background: The myocardial infarction (MI), the most common manifestation of coronary artery disease remains as a major cause of mortality in both developed and developing countries. The people without known major risk factors can be screened for MI with a simple and cost-effective tool which will be helpful in developing countries to reduce the mortality. Dermatoglyphic patterns in clinical conditions have been studied so far and their relationship is established in the literature. Dermatoglyphics has been considered as a diagnostic tool in many diseases with genetic bases. Hence this study is conducted to analyse the correlation between dermatoglyphic features and MI, so that dermatoglyphics may be used as screening tool for MI.

Materials and Methods: We conducted a cross-sectional study of 150 MI patients diagnosed with ECG or coronary angiography who were admitted in the Institute of cardiology, Madras Medical College, Chennai after obtaining clearance from Institutional ethics committee. 150 healthy consented volunteers were included as controls. The finger prints from both groups were taken by ink method and type of fingerprint patterns and total finger ridge count (TFRC) and absolute finger ridge count (AFRC) were studied. The correlation of the findings between cases and controls were analysed with t-test and Chi-square test using SPSS 13.0.

Results: The frequency of loop, arch and whorls is 54.9%, 8.3% and 36.8% respectively in MI as compared to 59.4%, 13.2% and 27.4% respectively in controls. The frequency of whorls is increased in thumb, middle finger and little finger of both hands of the MI patients when compared with controls with statistically significant difference ($p<0.005$). The mean value of TFRC and AFRC is increased in cases than controls and statistically significant difference was observed for AFRC.

Conclusion: Thus, our study has indicated the specific fingerprint patterns in MI and we hope this knowledge can be used for screening the people without known risk factors for MI.

KEY WORDS: Fingerprint, Dermatoglyphics, Myocardial infarction, early diagnosis.

Corresponding Author: Dr Arunkumar K R, Associate Professor of Anatomy, Dhanalakshmi Srinivasan Medical College and Hospital, NH-45, Trichy - Chennai Road, Siruvachur - 621113 Perambalur District, Tamil Nadu, India. **E-Mail:** drarunb4u@gmail.com.

Access this Article online	Journal Information
Quick Response code	**International Journal of Anatomy and Research** ISSN (E) 2321-4287 | ISSN (P) 2321-8967 **https://www.ijmhr.org/ijar.htm** **DOI-Prefix:** https://dx.doi.org/10.16965/ijar
DOI: 10.16965/ijar.2021.176	**Article Information** Received: 27 Sep 2021 | Accepted: 14 Nov 2021 Peer Review: 28 Sep 2021 | Published (O): 05 Dec 2021 Revised: None | Published (P): 05 Dec 2021

INTRODUCTION

The entire human body is clothed with the skin which is the largest organ of the body. The skin on the ventral sides of hands and plantar sides of feet is corrugated with the ridges and configurations which are functionally useful as

they help in grasping without which the objects would easily slip away from hands [1].

The scientific study of these papillary ridges on the palmar region of hands and fingers and plantar region of foot and toes is termed as Dermatoglyphics. The term 'Dermatoglyphics' was coined by Cummins and Midlo in 1926 [2]. The fingerprint pattern is divided into three main types, namely arch, loop and whorl. The arch type is further divided into two subgroups: simple and tented and the loop type is divided to two subgroups: radial and ulnar. The whorl type is divided to five groups as simple, central packed loop, twinned loop, lateral packed loop and accidental. In general population, the line pattern is consisted of 4%, 55% and 41% of arch, loop and whorls respectively [3].

The papillary ridges which are completely formed in the 25th week of fetal life are under genetic control and their configurations are determined by the morphologic events in the embryonic hand and feet[4]. From the time the primary ridges have been formed, no further change is apparent either in the structure of the ridges or the configurations they form. Once formed the dermal configurations are resistant to environmental effects and they can reflect the growth disturbances that occur before or after their development [4].

The relationship between dermatoglyphic features and some clinical conditions has been documented in literature[3] and these relations have invoked considerable interest in preventive medicine considering their possibility of providing inexpensive and noninvasive screening methods for certain diseases. Dermatoglyphic analysis can be an extremely useful screening tool for the preliminary investigation into conditions with a suspected genetic base [5].

Throughout the world, ischemic heart disease remains as the most common cause of death and they account for 16% of total deaths in the world according to WHO [6]. Myocardial infarction (MI), one of the manifestations of ischemic heart disease is due to formation of atherosclerotic plaques in the inner walls of the coronary arteries resulting in reduced blood flow to the heart and injuring heart muscles because of poor oxygen supply. The etiopathogenesis of myocardial infarction is related with complex interplay of numerous genetic and environmental factors [7].

Considering the genetic predisposition of dermatoglyphics and myocardial infarction, this study was conducted to find out correlation between them so that dermatoglyphics may be helpful in the screening of predisposition towards myocardial infarction at an earlier age. If an individual with specific pattern of dermatoglyphics is susceptible to MI, he or she can be screened for prevention by controlling other risk factors in early detection programs.

Hence this study is conducted with the following aims and objectives:

1. To study the dermatoglyphic pattern in fingertips of MI cases and controls.

2. To establish sexual and digital differences in dermatoglyphic patterns of MI patients.

3.To find out whether a specific dermatoglyphic pattern exists in MI and whether it is significant.

To observe the usefulness of dermatoglyphic patterns in serving as predictor of MI.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Institute of Anatomy, Madras Medical College, Chennai-3 after obtaining approval from institutional ethics committee. The palm prints of the patients admitted in the Institute of Cardiology, Madras Medical College, Chennai-3 with myocardial infarction were taken after getting informed consent. Of them 120 were Males and 30 were females. Similarly, the palm prints of equal number from the voluntarily consented normal healthy individuals in and around Chennai were taken as controls. The individuals with previous history of any coronary artery disease, systemic hypertension, dyslipidemia was excluded from controls. The study group (Cases) included the persons admitted in the Institute of Cardiology with chest pain, in whom the diagnosis of myocardial infarction was confirmed by E.C.G and some of them by Coronary Angiography. The persons with history of any diseases like

diabetes mellitus, mental illness, chronic skin pathologies like eczema, chronic dermatitis leprosy, congenital or acquired deformities of hand were excluded from both case and control groups.

The fingerprints were taken by ink method as described by Cummins and Midlo [2]. The materials used were black duplicating ink, roller, glass plate, proforma sheets, magnifying lens and needle for ridge counting. The print was taken on the proforma sheets which were coded with age and sex for cases and control groups. The prints taken were studied thoroughly for detailed dermatoglyphic analysis with the help of magnifying hand lens. The type of fingerprints was categorized into loops, arches and whorls. The quantitative parameters used were total finger ridge count (TFRC) and absolute finger ridge count (AFRC). Ridge counting was done with the help of a sharp needle. The data obtained were analyzed statistically using statistical software SPSS 13.0. The statistical significance was studied with help of t-test and chi-square tests. The p value < 0.05 was considered as statistically significant

RESULTS

In our study there were 120 males and 30 females in each group. The age ranges from 27-76 with the mean age of male and female being 50.25 years and 53.50 years respectively in myocardial infarction. The age ranges from 25-75 years with mean age of male and female being 44.67 years and 52.80 years respectively in controls.

Qualitative analysis of fingertip patterns:

Finger Tip Patterns in myocardial infarction patients and controls. (Table 1): The frequency of loops is 54.4% and 56.7% in MI males and MI females as compared to 62.3% and 47.7% in control males and control females respectively. The occurrence of arches is 8.0% and 9.3% in MI males and MI females as compared to 10.1% and 25.7% in control males and control females respectively. The percentage of whorls is 37.6% and 34.0% in MI males and MI females as compared to 27.6% and 26.6% in control males and control females respectively. The frequency of loop, arch and whorls is 54.9%, 8.3% and 36.8% respectively in MI (M+F) as compared to 59.4%, 13.2% and 27.4% respectively in control (M+F). Thus, there is decrease in the frequency of loops and arches in both sexes with corresponding increase in the frequency of whorl patterns in MI as compared to the controls.

Digit wise frequency of fingertip patterns in both hands of MI cases and controls: In MI cases, there is increase in the frequency of loops in index finger (D2) and middle finger (D3), arches in thumb (D1) and ring finger (D4) and whorls in D1 and little finger (D5). The maximum percentage of loops is 67.3% in D2 of right hand and 65.3% in D2 of left hand. The maximum percentage of arches is 12% in D4 of right hand and 8% in D1and D2 of left hand. The maximum percentage of whorls is 48.7% seen in D5 of right hand and 43.3% in D1 of left hand. (Table 2).

In controls, there is an increase in the frequency of loops in D3 and D5 and whorls in D2 and D4 and arches in D1 and D2. The maximum percentage of loops is 81.3% in D3 of right hand and 70.0% in D3 of left hand. The maximum percentage of arches is 24% in D1 of right hand and 23% in D1 of left hand. The maximum percentage of whorls is 44.0% seen in D4 of left hand and 36.67% in D4 of right hand (Table 3).

Gender differences in Fingertip patterns of both cases and controls (Table.4): The frequency of loops decreases in most of the digits of the MI male patients with statistically significant difference in all the digits except D4 ($p<0.05$). But the frequency of loops increases in females as compared to controls and the statistically significant difference is seen only in D2 ($p<0.05$). The frequency of arches is decreased in first two digits of male patients with statistically significant difference ($p<0.05$) as compared to controls and in all digits of female patients with statistically significant difference in all digits ($p<0.01$) except D4 as compared to controls. The frequency of whorls in male patients is increased in D1, D3 and D5 with statistically significant difference ($p<0.0001$) as compared to controls. In females also, the frequency is increased in D1, D3 and D5 with statistically significant difference

(p<0.05) as compared to controls.

Statistical analysis of digit wise frequency distribution of Fingertip patterns between right and left sides – (Table 4): There is decrease in frequency of loops in most of the digits of both hands in MI patients with statistically significant difference (p<0.05) in all the digits except D1 of both hands and D5 of left hand when compared with controls. There is decrease in the frequency of arches in all the digits of left hand and D1 and D2 of right hand in MI as compared to controls. The statistically significant difference (p<0.05) between cases and controls is seen in D1 of right hand and D1 and D4 of left hand. The frequency of whorls increases in D1, D3 and D5 of both hands of the MI patients when compared with controls with statistically significant difference (p<0.005) in the above-mentioned digits except D3 of left hand.

Statistical comparison of different Fingertip patterns between MI cases and controls in (a) Males and Females and (b) Right hand and Left hand. (Table 5 and Table 6).: In MI males, the loops are seen in 54.4%, arches in 8.0% and whorls in 37.6% whereas in controls, the loops are seen in 62.3%, arches in 10.1% and whorls in 27.6%. Thus, there is decrease in the percentage of both loop and arch patterns and increase in the percentage of whorl pattern with statistically significant difference seen in loop pattern (p<0.0001) and whorl pattern (p<0.000001).

In MI females, loops are seen in 56.7%, arches in 9.3% and whorls in 34% but in controls, the loops are seen in 47.7%, arches in 25.7% and whorls in 26.6%. Thus, there is increase in the percentage of both loop and whorl pattern and decrease in the arch pattern with statistically significant difference in loop (p<0.05) and arch pattern (p<0.000001).

In both sexes of MI, the frequency of loops, arches and whorls is 54.9%, 8.3% and 36.8% respectively while in controls of both sexes, it is 59.4%, 13.2% and 27.4%. Thus, there is overall decrease in the frequency of loops and arches and significant increase in the frequency of whorls in MI patients (M+F). The statistical significance is seen in all the patterns; loop (p<0.05), arch (p<0.0001) and whorl(p<0.000001).

Table 1: Distribution of fingertip patterns in cases and controls.

Subject	Sex	Side	Loops(%)	Arches(%)	Whorls(%)
MI	Males	R	57.8	9.5	38.7
		L	57	6.5	36.5
		R+L	54.4	8	37.6
	Females	R	50.7	10.7	38.6
		L	62.7	8	29.3
		R+L	56.7	9.3	34
	M+F	R	51.6	9.7	38.7
		L	58	6.8	35
		R+L	54.9	8.3	36.8
Controls	Males	R	64.7	9.2	26.1
		L	60	11	29
		R+L	62.3	10.1	27.6
	Females	R	49.3	24	26.7
		L	46	27.3	26.7
		R+L	47.7	25.7	26.6
	M+F	R	61.6	12.1	26.3
		L	57.2	14.3	28.5
		R+L	59.4	13.2	27.4

Table 2: Digit wise frequency distribution of fingertip patterns of both hands in MI cases.

Digits	Side	Loops (%)		Arches (%)		Whorls (%)		Total Loops (%)	Total Arches(%)	Total Whorls (%)
		M	F	M	F	M	F			
D1	R	43.3	43.3	10	16.7	46.7	40	43.3	11.3	45.3
	L	48.3	50	5	20	46.7	30	8.67	8	43.3
D2	R	63.3	83.3	10	0	26.6	16.7	67.3	8	24.6
	L	66.7	60	7.5	10	25.8	30	65.3	8	26.7
D3	R	62.5	73.3	8.3	0	29.2	26.7	64.7	6.7	28.7
	L	55	56.7	6.7	0	35.8	43.3	55.3	5.3	39.3
D4	R	44.2	33.3	8.3	26.7	47.5	40	42	12	46
	L	60.8	66.7	5	10	34.2	23.3	62	6	32
D5	R	45.8	20	10.8	10	43.4	70	40.7	10.7	48.7
	L	54.2	80	8.3	0	37.5	20	59.3	6.7	34

M- Males, F – Females,, R- Right, L- Left ,D1- Thumb , D2- Index finger , D3 – Middle finger, D4- Ring finger D5- Little finger

Table 3: Digit wise frequency distribution of fingertip patterns of both hands in controls.

Digits	Side	Loops (%)		Arches (%)		Whorls (%)		Total Loops (%)	Total Arches (%)	Total Whorls (%)
		M	F	M	F	M	F			
D1	R	52.5	40	20	40	22.5	20	54	24	22
	L	60	50	17.5	40	22.5	10	56	23	21
D2	R	46.7	40	15	10	38.3	50	45.3	16	39.3
	L	55	40	17.5	40	22.5	10	56	23	21
D3	R	84.1	70	3.3	10	12.5	20	81.3	4.6	14
	L	70	70	10	16.7	20	13.3	75.7	8	16.3
D4	R	60	46.7	0	30	40	23.3	57.3	6	36.7
	L	45	30	10	30	45	40	49.7	10	40.3
D5	R	75	50	7.5	30	7.5	20	70	12	18
	L	70	40	2.5	30	27.5	30	67	10	23

Table 4: Gender differences in Fingertip patterns of both cases and controls.

FTP	SUB	Males (120+120)					Females (30+30)				
		I	II	III	IV	V	I	II	III	IV	V
L	MI	110	156	141	126	120	28	43	39	30	30
	Con	141	122	185	126	174	27	24	42	23	27
	X_2	7.52	9.31	17.68	0.01	24.66	0	10.95	0.15	1.22	0.13
	P value	0.00611	0.002	0.00002	0.927	0	1	0.00093	0.69668	0.27	0.714
	Remark	S	S	S	NS	S	NS	S	NS	NS	NS
A	MI	18	21	18	16	23	11	3	0	11	3
	Con	45	36	16	12	12	24	9	8	18	18
	X_2	12.35	3.9	0.03	0.34	3.08	5.81	5.4	6.56	1.64	11.31
	P value	0.00044	0.048	0.8587	0.559	0.07916	0.01594	0.01047	0.00304	0.2	0
	Remark	S	S	NS	NS	NS	S	S	S	NS	S
W	MI	112	63	81	98	97	21	14	21	19	27
	Con	54	82	39	102	54	9	27	10	19	15
	X_2	29.92	3.2	34.36	0.08	17.04	5.38	5.33	0.47	0.04	4.43
	P value	0	0.073	0	0.781	0.00003	0.02039	0.0209	0.49356	0.844	0.035
	Remark	S	NS	S	NS	S	S	S	NS	NS	S

S – Significant, NS – Not Significant, MI – Myocardial Infarction cases, Con – Controls, L– Loops, W – Whorls, A - Arches

Table 5: Statistical comparison of different fingertip pattern between MI and controls in males and females.

Sex	SUB	Finger Tip Patterns		
		Loops	Arches	Whorls
M (Total -1200)	MI	653	96	451
	Control	748	121	331
	chi-sq	15.15	2.92	26.86
	p-value	0.0000992	0.0875	0.0000002
	Remark	S	NS	S
F (Total – 300)	MI	170	28	102
	Control	143	77	80
	chi-sq	4.52	26.6	3.48
	p-value	0.03359	0.0000003	0.06218
	Remark	S	S	NS
M+F (Total -1500)	MI	823	124	553
	Control	891	198	411
	chi-sq	6.11	18.54	30.39
	p-value	0.013	0.0000166	0
	Remark	S	S	S

Table 6: Statistical comparison of different fingertip pattern between MI and controls in both hands.

SIDE		Finger Tip Patterns		
		Loops	Arches	Whorls
Rt Hand (Total – 750)	MI	387	73	290
	Control	462	91	197
	chi-sq	14.86	1.98	25.74
	p-value	0.0001157	0.1595	0.0000004
	Remark	S	NS	S
Lt Hand (Total – 750)	MI	436	53	263
	Control	429	107	214
	chi-sq	0.1	19.65	7.08
	p-value	0.75386	0.0000093	0.0077845
	Remark	NS	S	S

Table 7: Statistical calculation of TFRC in total MI and controls.

Sub	Sex	TFRC (Mean ± SD)	AFRC (Mean ± SD)
Cases	M	129.04 ± 42.31	190.8 ±74.44
	F	121 ± 39.34	162.7 ± 74.152
	M+F	127.5 ± 41.78	185.2 ± 75.17
Controls	M	104.95 ± 33.46	182.3 ± 68.59
	F	93.5 ± 21.79	121.05 ± 36.19
	M+F	102.67 ± 31.81	169.7 ± 69.27

Quantitative characteristics of finger patterns: ridge counts:

The ridge counts, which are size related numerical representatives of pattern types are considered to be of greatest significance in genetic terms. The absolute and total ridge counts effectively summarize the quantitative characteristics of all digits of either hand [8].

Total Finger Ridge Count (TFRC):

In the present study, there is increase in the mean value of TFRC in MI males and females and also in MI (M+F) when compared with the control (Table 7). There is a statistically significant difference in the mean value of TFRC

Table 8: Test of Significance of TFRC & AFRC for comparison between total MI cases and controls.

Comparison	TFRC			AFRC		
	t-value	p value	Remark	t-value	p value	Remark
MI males Vs Control Males	4.8923	0.0001	**S**	0.9199	0.3586	NS
MI females Vs Control females	3.3495	0.0014	**S**	2.764	0.0076	**S**
MI cases Vs Controls	5.7912	0.0001	**S**	1.857	0.0643	NS

between MI cases and controls (p<0.001). (Table 8)

Absolute Finger Ridge Count:

There is increase in the mean value of AFRC in MI males, MI females when compared with the controls (Table 7). But statistically significant difference in the mean value is observed between MI females and control females but not in other groups. (Table 8).

DISCUSSION

Dermatoglyphics has been identified as a diagnostic tool in a number of diseases with strong hereditary basis[9]. As the hereditary factors play a major role in the pathogenesis of Myocardial Infarction, certain dermatoglyphic variation is to be expected in it [9]. The present study was done to identify the variations in the fingertip patterns among MI cases and normal population (controls). The observed values in the current study were first subjected to the test of statistical significance and the findings were then compared with the available literature of previous workers.

Qualitative analysis of finger prints:

Loops: In the present study, there is decrease in the frequency of loops in MI cases. The loop pattern is significantly decreased in the right hand of MI cases. The frequency of loop is significantly decreased in the middle finger (p<0.01), ring finger (p<0.05) and little finger (p<0.00001) of right hand and middle finger of left hand (p<0.05). Anderson et al found decrease in the loop pattern in MI [10]. Dhall et al revealed that the loop pattern was significantly lower in MI patients as compared to the control group (p<0.001) [9]. Jalali et al also reported significant decrease in the percentage of loops in MI [11]. Chimne et al also found out the significant decrease in loop pattern in all digits of coronary artery disease (CAD) patients [12]. Saxena et al [13], Patloo et al [14], and Kakkeri et al [15] also reported lower incidence of loops in MI cases when compared to controls. Thus, the finding of decreased percentage of loops in the present study coincides with finding of above workers. But Shamsadini S et al noted significant increase in the frequency of loops in MI patients (p<0.001) [16].

Arches: In the present study, there is significant decrease in frequency of arches in MI cases than the controls (p<0.0001). The frequency of arches is significantly decreased in thumb (p<0.05) and index finger (p<0.05) of both hands in male and female patients of myocardial infarction. Dhall et al noted decrease in the frequency of arches in MI patients but not statistically significant [9]. But Jalali et al reported two- fold increase in the frequency of arch pattern in MI patients [11]. They also noticed the increased arch pattern in all the digits of MI patients with significant increase in left thumb, left index and left ring finger. Chimne et al documented the decrease in the percentage of arches in CAD patients of both sexes and in both hands but not significant [12]. Saxena et al [13], Patloo et al [14] Kakkeri et al [15] found out lower incidence of arches in MI cases.

Whorls: In the present study, the frequency of whorl is increased in MI patients (P<0.000001) when compared to controls and significantly increased in both hands (p<0.01). The frequency of whorls is significantly increased in the thumb (p<0.0001) and middle finger (p<0.01) of both hands and index finger (p<0.005) and little finger (p<0.00001) of right hand and ring finger (p<0.05) of left hand. Anderson et al [10] and Jalali et al [11] reported increased whorls in MI but not statistically significant. Chimne et al found out that percentage of whorls is increased in all digits of CAD in both sexes (except D4 in females) and in both hands with significant increase in D5 in males (p<0.01) and D1 and D5 of left hand

(p<0.05) [12]. Dhall et al also reported significant increase in the whorls in right thumb, right little finger and left ring finger [9]. Chimne et al too observed significant increase in thumb and little finger of left hand in CAD [12].

Quantitative analysis of finger print: In the present study, there is significant increase in the mean value of TFRC and AFRC in MI patients. Rashad et al observed significant increase in TFRC and AFRC in MI patients [17]. Anderson et al [10] and Chimne et al [12] noted the increase in TFRC and AFRC in MI patients but not statistically significant. Sharma et al reported increased TFRC and AFRC in coronary artery disease patients [18].

The significance of dermatoglyphics in clinical medicine has been demonstrated as early as in nineteenth century [19]. The papillary ridges develop in utero during the end of first trimester and initial phases of second trimester during which the development of cardiovascular system and is influenced by multiple factors. Previous studies have indicated the genetic association between dermatoglyphics and cardiac anomalies [20]. The characteristic dermatoglyphic patterns occurring in coronary artery disease can be utilized in screening the population for susceptibility for ischemic heart disease which will be a non-invasive and cost-effective screening.

CONCLUSION

The following conclusions are derived from the present study: The frequency of loop, arch and whorls is 54.9%, 8.3% and 36.8% respectively in MI and 59.4%, 13.2% and 27.4% respectively in controls. Thus, there is decrease in loops and arches with increase in whorls in most of the digits of both hands in MI. There is significant decrease in loops in middle finger of both hands (p<0.05) and arches in thumb and index finger of both hands (p<0.05) in MI. There is significant increase in whorls in thumb (p<0.05) and little finger (p<0.05) of both hands in MI. The mean value of TFRC is 127.5 and 103 in MI and controls respectively. The increase in the mean value of total finger ridge count (TFRC) in MI patients as compared to controls and is statistically significant in the present study (p< 0.01). The mean value of AFRC is 185 in MI and 170 in controls. Thus, there is increase in the mean value of absolute finger ridge count (AFRC) with statistically significant increase in female patients of MI (p<0.005).

Hence, from the present study, it appears that there do exist variations in the dermatoglyphic patterns in Myocardial Infarction. The specific features of dermatoglyphic patterns present in it raise the possibility of using dermatoglyphic study as a mass screening program for prevention of MI.

ACKNOWLEDGEMENTS

We would like to express our profound gratitude to our mentor and teacher Dr. Christilda Felicia Jebakani, former Director, Institute of Anatomy, Madras medical college for her guidance and valuable suggestions for this study.

Conflicts of Interests: **None**

REFERENCES

[1]. Bell C. The Hand, its Mechanism and vital endowments as evincing design. Philadelphia: Carey, Lea & Blanchard; 1833. p. 100-115.

[2]. Cummins H and Midlo. Palmar and plantar epidermal configurations (dermatoglyphics) in European Americans. Am J Phys Anthropol. 1926;9:471-502.

[3]. Shamsadini S, Masomi M, Nagad-Hossini M. Relation between the lines on the fingers of hand and the incidence of disease in human. Scientific Journal of Kerman Medical Science University. 1997;4(3):136-142.

[4]. Penrose L.S., Ohara P.T. The Development of Epidermal Ridges. Journal of Medical Genetics. 1973;10:201-208.

[5]. Shiono. H. Dermatoglyphics in medicine. Am J Forensic Pathol. 1986 June;7(2):120-126

[6]. The top ten causes of death. Available from https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death (last accessed on 20.04.2021)

[7]. Fischer M et al. Distinct heritable patterns of angiographic Coronary Artery Disease in families with Myocardial Infarction. Circulation. 2005;111:855-862.

[8]. Gibbs RC. Fundamentals of Dermatoglyphics. Arch Derm. 1967 Dec;96:721-725.

[9]. Dhall V, Rathee SK, Dhall A. Utility of finger prints in myocardial infarction patients. J Anat Soc India. 2000;49(2):153-154.

[10]. Anderson MW, Haug PJ, Critchfield G. Dermatoglyphic features of Myocardial Infarction patients. Amer J Phys Anthropol. 1981;55(4):523-27.

[11]. Jalali F, Hajian Tilaki KO. A Comparative Study of Dermatoglyphic Pattern in Patients with Myocardial Infarction and Control Group. Acta Medica Iranica. 2002;40(3):187-91.
[12]. Chimne HD, Ksheersagar DD. Dermatoglyphic patterns in angiographically proven coronary artery disease. J. Anat. Soc. India 2012;61(2): 262-268.
[13]. Saxena AK, Aneja PS, Sood KS, Bansal S, Sharma NK. A comparative study of dermatoglyphics (finger tip pattern) in patients with myocardial infarction and control group. Journal of Evolution of Medical and Dental Sciences. 2013;18(2):31 10-117.
[14]. Patloo AA, Khan MA, Bashir N. Dermatoglyphics: a study of finger tip patterns in CAD patients of north India and its genetic disposition. Int J Health Sci Res. 2017;7(12):52-57.
[15]. Kakkeri SR, Attar H, Khan J. Dermatoglyphics Pattern in Patients with Ischemic Heart Disease. Indian Journal of Forensic Medicine and Pathology. 2018;11(2):115-18.
[16]. Shamsadini S, Masomi M, Nagad-Hossini M. Relation between the lines on the fingers of hand and the incidence of disease in human. Scientific Journal of Kerman Medical Science University. 1997;4(3):136-142.
[17]. Rashad MN, Mi MP, Rhoads G. Dermatoglyphic studies of myocardial infarction patients. Hum Hered. 1978;28:1–6.
[18]. Sharma S, Mathur S. The study of dermatoglyphic analysis in coronary artery disease patients. International Journal of Research and Review. 2020;7(2): 459-61.
[19]. Cummins H. Dermatoglyphics stigmata in Mongolism. Anat. Record. 1936;64 (suppl2):11.
[20]. Alter M, Schulenberg R. Dermatoglyphics in congenital heart disease. Circulation. 1970;41:49-54

How to cite this article:

Arunkumar K R. Delhiraj U, Dhanalakshmi V. A Study of Dermatoglyphic Patterns of Fingers in Patients with Myocardial Infarction. Int J Anat Res 2021;9(4):8160-8167. **DOI:** 10.16965/ijar.2021.176