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COMPARATIVE STUDY ON THE DERMATOGLYPHIC PATTERN AMONG DIABETIC (TYPE-2) AND NON-DIABETIC ADULTS IN NORTH INDIAN POPULATION

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ABSTRACTS

Dermatoglyphics is the study of epidermal ridges and their configurations. The appearance of it in individual is genetically determined; as the diabetes mellitus has also a genetic background; one can assume that there might be certain specific dermatoglyphic findings in diabetic patients. ***Aims & objectives:*** The aim of study is to determine the dermatoglyphic patterns and their co-relation with Type 2 diabetes mellitus in North Indian population. ***Material & Methods:*** This study was conducted in Department of Anatomy, IIMS & R Hospital, Lucknow. The 100 diabetic subjects were enrolled as test group and150 non-diabetic healthy subjects were enrolled as control group from healthy population. To record the fingertip patterns, *Modified Purvis-Smith ink* method was applied. ***Results:*** In both diabetic males and females *WHORLS* are most common pattern ($p \leq 0.000$, Extremely Significant) in both right (52.07% males; 53.19% females) and left (51.32% males; 51.48% females) hands. However in non - diabetic subjects; both in males and females; *LOOPS* are most common (Extremely Significant, $p \leq 0.000$) in both right (61.19% males; 66.67% females) and left hand. (56.90% males; 66.06% females) **Conclusion:** In our study, the whorls are most common pattern in both right and left hands of both male and female diabetic subjects and loops are most common pattern in both right and left hands, in both males and females among non-diabetic subjects.

KEY WORDS: Dermatoglyphics; Diabetes mellitus; Finger tip; Adults.

INTRODUCTION

Diabetes is a multisystem disorder that affects many organs of the body.[1] It has become a major health challenge worldwide.[2] According to the WHO estimation, a significant amount of the health budget goes to Diabetes health care and related disabilities.[3] In 2030, it is estimated that the total number of diabetes - affected people will reach 366 million. This idea is also supported by the fact that, annually, 3.2 million persons die of diabetes, 8,700 die every day, 6 persons every minute, which explains the anticipations provided by World Health Organization, International Diabetes Federation, European Association for the Study of Diabetes and European Diabetes Care Predicators (EURO DIAB) according to which, in the future diabetes will be on the top of the mortality and morbidity causes.[4] *(EASD; 2004), World Health Organization (WHO) Report (1999)*[5], *WHO (2004)*[6] Dermatoglyphics is the study of epidermal ridges and their configurations. The term dermatoglyphics arrived from ancient Greek word; derma = "skin," glyph = "carving") is the scientific study of fingerprints.[7] Digital finger patterns include various types like loops (ulnar or radial), whorl and arch. Loops have an open end, depending on which they are classified into radial or ulnar. Loops and whorls have a core (centre) whereas arches have no core. Arches have ridges which rise at the Centre.[8]

Dermatoglyphics is related to individual genetics; as the diabetes mellitus has also a genetic background; one can assume that there might be certain dermatoglyphic findings specific to diabetic patients. It shows strong positive co- relation with type-2 diabetes. In clinical medicine, the importance of dermatoglyphics is that it can help in predicting the phenotype of a possible future illness. Early identification of at-risk individuals using simple screening tools like dermatoglyphics which is user friendly; economically viable would greatly help in preventing or postponing the onset of diabetes and thus reducing the burden on the community and the nation as a whole. Hence this study will give the positive co-relation between diabetes mellitus and dermatoglyphics.

MATERIALS AND METHODS

This study was conducted in Department of Anatomy and, IIMS & R, Hospital, Lucknow, during January 2015 to December 2015. The 100 patients (males and females) of diabetes mellitus (type-2) were enrolled as "test group" from Department of Medicine IIMS & R, Hospital Lucknow and150 non-diabetic healthy subjects (males and females) were selected as "control group" from healthy population of Lucknow. To record the fingertip patterns, *Modified Purvis-Smith ink* method was applied (Ulnar loop, radial loop, whorl, plane arch, tented arch).[9] Fingers were impregnated and are pressed on A4 paper, and clear prints were classified into digital patterns arches, loops, whorls and composite. The counting was done using a hand lens. Each fingerprint was independently scored. The data were statistically analyzed by using the *Chi squire tests*, p-values (less than) ≤0.05 was considered as statistically significant.

RESULTS

In present study, total 250 subjects were enrolled; of these 100 were diabetics and 150 were non-diabetics healthy subjects (control group); out of which, maximum number 87(34.80%) of patients were belong to 40-49 yrs and minimum 10 (4.00%) subjects were belong to ≥ 70 years of age group. Among in diabetics maximum number of patients was belonging to 29 (29.00%) 50-59 yrs of age group. *(Fig1)* of these maximum 54.80% (137) were males and 45.20% (113) were females. Total 21.6% (54) subjects were reported an associated family history of diabetes; of these 10% (25) were belong to diabetic group and 11.6% (29) to non-diabetic group.

In diabetic males; *WHORLS* are present most common in both right (52.07%) (p≤0.000, *Extremely Significant*) and left (51.32%) (p≤0.000, *Extremely Significant*) hands compare to right (29.04%) and left hands (37.38%) of *non-diabetic subjects.* *However* ***in non-diabetic*** *males, LOOPS* are most common (*Extremely Significant;* p ≤0.000) in both right (61.19%) and left hand (56.90%), compare to right (42.26%) and left hand (44.15%) of diabetic males; *ARCHES* are more frequent in non diabetic males but statistically *Not Significant in both right and left hands. (Table 1)* ***In diabetic females;*** *WHORLS* again most common in both right (53.19%) (p≤0.000, *Extremely Significant*) and left (51.48%) (p≤0.000, *Extremely Significant*) hands, compare to right (25.45%) and left hands (27.57%) of non-diabetic subjects***.*** ***In non diabetic females,*** *LOOPS* are *Extremely Significant* in both right **(66.67%)** (p≤0.000) and left hands (66.06%) (p≤0.000), compare to right (40.0%) and left hand (43.40%) of diabetic females; *ARCHES* are more frequent in non diabetic females but statistically *Not Significant in both right and left hands. (Table 2)*

Observations

Table No. 1: Comparison (with statistical analysis) of Finger print Patterns between Diabetic and Non- diabetic Male Subjects

SN	Group wise distribution of Finger print Pattern	Right hand			Left hand		
		Diabetic Male (n=265)	Non Diabetic Male (n=420)	p value	Diabetic Male (n=265)	Non Diabetic Male (n=420)	p value
1	Arches	15 (5.66%)	41 (9.76%)	0.078, Not Significant	9 (3.39%)	24 (5.71%)	0.231, Not Significant
2	Loops	112 (42.26%)	257 (61.19%)	0.000, Extremely Significant	117 (44.15%)	239 (56.90%)	0.001, Extremely Significant
3	Whorls	138 (52.07%)	122 (29.04%)	0.000, Extremely Significant	139 (51.32%)	157 (37.38%)	0.000, Extremely Significant
	Grand total	265 (100%)	420 (100%)		265 (100%)	420 (100%)	

Table No. 2: Comparison (with statistical analysis) of Finger print Patterns between Diabetic and Non- diabetic Female Subjects

SN	Group wise distribution of Finger print Pattern	Right hand			Left hand		
		Diabetic Female (n=235)	Non Diabetic Female (n=330)	p value	DiabeticFemale (n=235)	Non Diabetic Female (n=330)	p value
1	Arch	16 (6.80%)	26 (7.87%)	0.753, Not Significant	12 (5.10%)	21 (6.36%)	0.65 , Not Significant
2	Loop	94 (40.0%)	220 (66.67%)	0.000, Extremely Significant	102 (43.40%)	218 (66.06%)	0.000, Extremely Significant
3	Whorls	125 (53.19%)	84 (25.45%)	0.000, Extremely Significant	121 (51.48%)	91 (27.57%)	0.000, Extremely Significant
	Grand total	235 (100%)	330 (100%)		235 (100%)	330 (100%)	

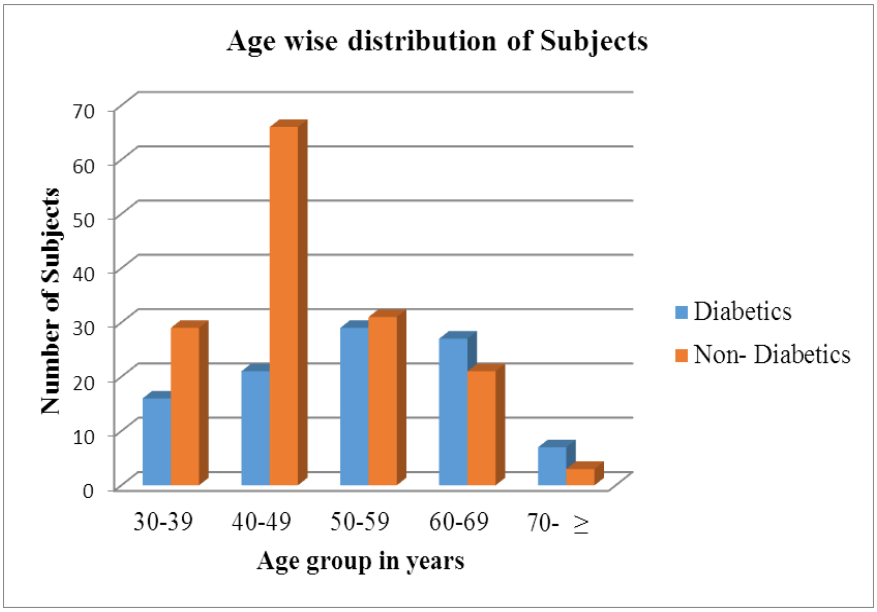

Figure: 1: Age wise distribution of both diabetic and non-diabetic subjects

DISCUSSION

In present study, frequency of whorls was significantly more in both right and left hand of diabetic males (extremely significant) compare to non-diabetic males. This was similar to *Feroz khan, et al (2013)*[10] *and Sant, et al (1983)*[11], in which frequency of whorls is significantly increased in diabetic patients and dissimilar to *Karim, et al (2014)*[12] in which whorls decreased significantly (P<0.05) in diabetic subjects. The result of our study was dissimilar to results of *Ravindranath, et al (1995)*[13] *and Verbov, et al (1973)*[14] *study* which found a decreased frequency of whorls in diabetic females and similar to *Sarthak Sengupta, et al (1996)*[15] in which the frequency of whorls was increased in male diabetics. *In females;* whorls were significantly (p≤0.000) more in both right and left hand of diabetic groups. Plain whorls were (p≤0.000), extremely significant in right and left hands of diabetic females. Double loop whorl was statistically significant (p≤ 0.002) in left hand and accidental whorl was statistically significant (p≤ 0.027) in right hand of diabetic females.

In our study loops were found more frequently in both hands of non-diabetics and statistically extremely significant (p≤0.000) in both right and left hands in non-diabetic males, compare to diabetic males, this was similar *to Feroz khan, et al (2013)*[10] in which frequency of loops is significantly decreased in diabetic subjects. In female subjects loops were also found more frequently (extremely significant) in both hands of non-diabetic. Among specific patterns; *ulnar loops* were found to be more frequent (extremely significant, p≤0.000) in non-diabetic females and the *radial loops* were also found more frequently in both hands of non-diabetic females compare to diabetic females but statistically not significant, this is similar to *Ravindranath, et al (1995)*[13] study, which reported reduced frequency of radial loops in diabetics' female.

In the present study, percentage of arches was more in non-diabetic group than in the diabetic group. This is dissimilar to *Vera, et.al (1995)*[16] *and Panda, et al (2004)*[17] *study in* which arches were increased in diabetic patients. In our study *Arches* have an increased frequency in both right and left hand of non-diabetic males. This was dissimilar to *Pramila, et al (2011)*[18] study in which arch pattern was higher in diabetics female and *Karim, et al (2014)*[12] study in whom plane arches increased significantly (P<0.05) in diabetic type-2 patients. In our study, arches were found more in non-diabetics females compare to the diabetic females group in both right and left hands, but the difference is not much (statistically not significant). This result of our study was opposed by *Sant, et al (1983)*[11] *and Verbov, et al (1973)*[14] *studies* in which arches were found to an increased frequency in diabetic females.

CONCLUSION

In our study, the *WHORLS* are most common pattern in both right and left hands of both male and female diabetic subjects and *LOOPS* are most common pattern in both right and left hands, in both males and females in non - diabetic subjects. The Arches were significantly reduced in both right and left hand of male and females in diabetics and non-diabetic subjects. This study show significant association between the finger print patterns and diabetes in both sexes. Study may be useful to detect the high risk persons in the population, for type-2 diabetes mellitus; the earliest prediction and diagnosis of patients with type-2 diabetes mellitus will definitely improve the result of treatment and further complications. However; there are several studies that showed opposite results to our study; hence there is need to carry out further studies and larger samples should be examined in detail to further validate the findings of this study and come to definitive conclusion.

REFERENCE

1. Larsen, Kronenberg et al. Williams's textbook of endocrinology. Elsevier India Publisher, 2003; 10thEdition: 1428-1431.
2. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: Estimates for the year 2000 and projections for 2030. Diabetes Care 2004; 27: 1047-53.
3. Mohan V, Madan Z, Jha R, Deepa R, Pradeepa R. Diabetes- social and economic perspectives in the new millenium. Int. J. Diab. Dev. Countries 2004; 24: 29-35.
4. European Association for the Study of Diabetes (EASD). Available from: http://www.easd.org/ customfiles /genin fo.htm. 2004
5. World Health Organization (WHO). A report of WHO: Consultation, Definition, Diagnosis, Classification of Diabetes Mellitus and its Complications. 1999.
6. World Health Organization (WHO), International Diabetes Federation (IDF). Diabetes Action Now. 2004.
7. Schaumann B, Alter M. Dermatoglyphics in Medical Disorders. NewYork: Springer Verlag; Berlin, 1976; 27: 871.
8. Taiwo IA and Adebanjo O. Evaluation of association between digital dermatoglyphic traits and type-2 diabetes in Lagos, Nigeria. Nig Q J Hosp Med 2012; 22(3): 191-199.
9. Purvis-Smith, S.G. Finger and palm printing techniques for the clinician. *Med J. Aust* 1969; 2: 189.
10. Feroz khan, J. Pathan, Rubeena N. Hashmi. Variations of Dermatoglyphic Features in Non Insulin Dependent Diabetes Mellitus. International Journal of Recent Trends in Science and Technology 2013; 8(1): 410.
11. Sant SM, Vare AM, Fakhruddin S. Dermatoglyphics in diabetes mellitus. J Anat Soc India 1983; 3(2): 127-30.
12. Karim, Karim J, Mohammed AL, Saleem A. Dermatoglyphics Study of Finger Prints Pattern's Variations of a Group of Type II Diabetic Mellitus Patients in Erbil City. Zanco Journal of Pure and Applied Sciences 2014; 6(4): 11-13.
13. Ravindranath R, Thomas I.H. Finger ridge count and finger print pattern in maturity onset diabetes mellitus. Ind J Med Sci 1995; 49: 153-156.
14. Verbov JL. Dermatoglyphics in early onset diabetes mellitus. Human Hered. 1973; 23(6): 535-42.
15. Sengupta S, Borush J. Finger dermatoglyphic patterns in diabetes mellitus. J. Hum. Eco 1996; l7(3): 203-206.
16. Vera M, Cabrera E and Guell R. Dermatoglyphics in insulin dependent diabetic patients with limited joint mobility. Acta Diabetol 1995; 32(2): 78-81.
17. Panda M, Chinara PK, Nayak AK. Dermatoglyphics in diabetes mellitus. J Anat Soc India 2004; 53: 33-66.
18. Pramila M, Padmini, Narasinga Rao and Malleswari B. The Study of Dermatoglyphics in Diabetics of North Coastal Andhra Pradesh Population. Indian Journal of Fundamental and Applied Life Sciences 2011; 1(2): 75-80.