Original Research Article

A descriptive study on dermatoglyphics in type II diabetic patients

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Abstract

Background: Dermatoglyphic pattern, epidermal ridges found in the fingertips of the palm exhibits in various pattern like whorl, arch and loop. This pattern of arrangement develops by 22nd weeks of intrauterine life and persists all through the life without any change. Among the metabolic disorders available globally, Diabetes mellitus crowns itself to affect the quality of life of humans. Correlation of dermatoglyphic pattern among the diabetic patients may assist the health workers in screening the disorder at an earlier stage among the population. **Aim:** To study and compare fingertip dermatoglyphic patterns in the male diabetic patients with the female diabetic patients and to find out, whether the specific dermatoglyphic trait exist in the patients of diabetes mellitus and whether it is significant. **Materials and Methods**: The present study is undertaken with an aim to evaluate the dermatoglyphic features in diabetic patients. The study consists of 290 diabetic patients and were 145 males and 145 females. Dermatoglyphic prints were taken by "Ink Method" described by Cummins and Midlo and further subjected to statistical analysis to find the variations in the dermatoglyphic features among diabetic patients. **Results:** The Frequency of loop pattern is significantly increased in diabetic males (P<0.001) as compared to female diabetic patients. The frequency of both whorl and arch patterns are significantly increased in female diabetic patients (P<0.001) as compared to male diabetic patients. **Conclusion:** From the present study, it appears that there exist variations in the dermatoglyphic patterns among diabetic patients with an added advantage of screening through simple and economical 'ink' method. As the specific features of dermatoglyphic patterns are present in diabetic patients, it can be used for mass screening program to segregate the predicted diabetic patients.

Key Words: Diabetes, whorl, loop, arch.

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INTRODUCTION

Dermatoglyphics deals with the scientific study of epidermal ridge patterns on the palmar and palmar aspect of finger tips, palms, soles and toes. Diabetes Mellitus is a global disease and the worldwide prevalence of Diabetes Mellitus has risen dramatically over the past two decades from an estimated 30 million cases in 1985 to 177 million in 2000. Based on current trends more than 300 million individuals will have diabetes by the year 2025[4]. Early diagnosis and treatment are essential is preventing long term complications such as retinopathy, neuropathy and nephropathy. Most sufferers are asymptomatic and hence early diagnosis is a problem. One of the aetiology of diabetes mellitus is hereditary. In this study, we are trying to find out various dermatoglyphic patterns available bilaterally and in varying sex. Dermatoglyphics may be effectively employed as a screening procedure in the early detection of diabetes mellitus soon.

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METHODS AND MATERIALS

The Present study was carried out in the Department of Anatomy, Aarupadai Veedu Medical College and Hospital, Puducherry after getting permission from Research and Ethical Committee of Institution. Study sample consisted of 290 Diabetic patients including both 145 males and 145 females, between the age group ranging from 45 to 70 yrs. The study population included all clinically diagnosed Type II diabetic patients confirmed by investigations and all Type I diabetics, systemic diseases, metabolic syndrome (excluding type II diabetics), chromosomal abnormalities were excluded from the study. The study population were from the Kirumampakkam and surrounding area. Dermatoglyphic prints were taken by "ink method" as described by Cummins (1936) and Cummins and Midlo [1] (1943). After getting informed consent, the subjects were asked to clean their hands with soap and water. They were also asked to dry their hands but to leave some moisture. The requisite amount of ink daub is placed on the glass slab and is uniformly spread by the rubber roller to get a thin even ink film on the glass slab. The thin film of ink will be applied by passing the inked rubber roller uniformly over the palm of both hands. The palms will be examined for the uniformity of the ink. Palm of left hand of the subject will be then placed on the sheet of paper (Kept over the pressure pad) and will be gently pressed from proximal to distal end. The tip of the fingers are rolled from the radial to ulnar side to include all patterns. The same procedure will be repeated for right hand on a separate paper. The print obtained (Photograph 1) will be analyzed for the varying in pattern and tabulations of data were made. The data obtained for were tabulated and analyzed statistically in both the sexes and both the sides. The results were analyzed statistically, by Chi-square test. P value of < 0.05 was considered for Statistical significance. Statistical analysis was done using SPSS (Statistical Package for the Social Sciences) version 19 and Microsoft Excel 2007.

OBSERVATION AND RESULT

Photograph 1: Showing palmar print of right and left hand of male patient

Table 1: Shows the percentagewise distribution of finger tip pattern in male and female diabetic patients

Fingertip pattern	Male(n=145)				Female(n=145)			
	Right (n=725)	%	Left (n=725)	%	Right (n=725)	%	Left (n=725)	%
Loop	336	46	327	45	268	37	261	36
Whorl	242	33	272	38	290	40	329	45
Arch	147	21	126	17	167	23	135	19

Table 2: Shows the statistical comparison of different finger tip pattern between male and female diabetic patients

Finger tip pattern	Diabetic Patients				X^2	P value	Remark
	Male		Female				
	No.	%	No.	%			
Loop	663	46	529	36	18.43	0.001	S
Whorl	514	35	619	43	22.66	0.001	S
Arch	273	19	302	21	19.36	0.001	S

DISCUSSION

In the present study, frequency of loops in male type II diabetic patients is significantly increased as compared to female diabetic patients which is similar to the study of Anju Bala et al [2016][5] and Roopa Ravindranath et al (1995) [18]. The whorl pattern is also found to be significantly increased in female diabetics when compared to male diabetics in both hands in the present study, which is similar to the study of Manoj Kumar Sharma et al [2012] [8] Sant SM et al (1980), Li Yanhua Wu Shoushan Han et al (1990) [15], Shariatzadeh S.M.A et al (2002) [14], Hossein Rezaei Nezhad and Nasser Mahdavi Shah (2010) [10] and Sarthak Sengupta and Jina Boruah (1996) [18]. The decrease frequency of whorl in male diabetic patients of our present study coincides with Roopa Ravindranath et al (1995) [18] who reported decrease frequency of whorl pattern in male diabetic patients. Julian L. Verbov (1973) [17], Sant SM et al (1980), and M Pramila Padmini et al (2011) [7] observed increase frequency of arches in diabetic females. Thus, the finding of increase frequency of arch pattern in diabetic females in the present study coincides with the findings of above workers.

CONCLUSION

From the present study, it appears that there do exists a variations in the dermatoglyphic patterns in diabetic patients. This study has an advantage of being simple and economical as it uses 'ink' method. If the specific features of dermatoglyphic patterns are present in diabetic patients, it can be use for mass screening program to segregate the predicted diabetic patients. Thus this can decrease the morbidity and mortality rate caused by diabetes mellitus

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