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Sharmila D
PG & Research Department of Advanced Zoology and Biotechnology, Government Arts College for Men (Autonomous), Nandanam, Chennai, Tamil Nadu, India

Venkatesan L
PG & Research Department of Advanced Zoology and Biotechnology, Government Arts College for Men (Autonomous), Nandanam, Chennai, Tamil Nadu, India

Dharmarajan P
Institute of Diabetology, Madras Medical College (MMC), Chennai, Tamil Nadu, India

N Jothi Narendiran
PG & Research Department of Advanced Zoology and Biotechnology, Government Arts College for Men (Autonomous), Nandanam, Chennai, Tamil Nadu, India

Correspondence
Sharmila D
PG & Research Department of Advanced Zoology and Biotechnology, Government Arts College for Men (Autonomous), Nandanam, Chennai, Tamil Nadu, India

Genetic evaluation of dermatoglyphics patterns with recurrent pregnancy loss patients in Chennai

Sharmila D, Venkatesan L, Dharmarajan P and N Jothi Narendiran

Abstract

Dermatoglyphics is the scientific study of papillary ridges in the palm of the hand and fingers and soles of the feet and toes. The dermal ridges and the configuration which is once formed are not affected by age, development and environmental changes in the post-natal life and so, it has the potential to predict various genetic and acquired disorders with a genetic influence. Recurrent pregnancy loss also called recurrent miscarriage, spontaneous abortion; habitual abortion is defined as consecutive loss of three or more pregnancies before five months of gestation. Most of the factors responsible for recurrent pregnancy loss can be genetic abnormalities, uterine abnormalities, endocrine factors, immunological factors, lifestyle changes and hormonal imbalance. The aim of this study was to determine the dermatoglyphic features of patients with recurrent pregnancy loss compare to women with no genetic abnormality. Dermatoglyphic patterns of 100 females (cases) and 100 (control) were analyzed to detect any relation between recurrent pregnancy loss cases and dermatoglyphics. All the patients were asked and got their palmer dermatoglyphic impression on plain white A4 paper used the ink method. Recurrent pregnancy loss cases 5.65% were found to have Radial loops, 52.72% were found to have Ulnar loops, 30.18% were found to have whorls and 11.45% were found to have Arches. The result obtained from the controls 5.15% were found to have Radial loops, 60.15% were found to have Ulnar loops, 28.25% were found to have whorls and 6.45% were found to have Arches. There is very less study done on dermatoglyphic features in recurrent pregnancy loss. Dermatoglyphics is an upcoming integral part of forensic science and medicine.

Keywords: Recurrent abortions, dermatoglyphics, fingerprints, genetics

Introduction

The term 'Dermatoglyphics' has its origin form Greek Words; 'Derma' means Skin and 'Glyptic' means carving [1]. This term was coined by Dr. Harold Cummins, the father of American fingerprint analysis and Midlo in 1926. The first classification of finger prints (digital patterns) into arches, loops and whorls was done by Sir Francis Galton in 1890 [2]. Dermatoglyphics is the scientific learning of ridged skin patterns which can be found on our fingers, palms, toes and soles. The dermatoglyphic patterns make their appearance on volar aspect of palm as early as 6th to 7th week of gestation. They become prominent and subsequently reach their maximum size by 12th week of gestation. Once formed in intrauterine life, these patterns do not change throughout life [3].

Dermatoglyphics is correlated to diseases which are genetically as well as non-genetically related [4]. The various identification data used are fingerprints, handwriting, bite marks, DNA fingerprinting etc. Fingerprints are constant and individualistic and form the most reliable criteria for identification. Fingerprint is one of the oldest, reliable and mature biometric technologies and is considered one of the best, cheapest and legitimate proofs of identification [5, 6].

Recurrent abortion is defined as the spontaneous loss of pregnancy prior to the 20th gestational week of pregnancy. Pregnancy losses which occur during this period of time are said to occur in about 15 percent of pregnancies. The risk of miscarriage increases proportionately to the number of previous miscarriages experienced. Unfortunately, a definite cause has been difficult to determine. Over the years, miscarriages have been observed as a somewhat "normal" finding. However, there has developed a somewhat more aggressive approach over the last 5 to 10 years towards evaluation and management of women with recurrent pregnancy loss [7]. The objective of this study was therefore to establish the dermatoglyphic patterns and parameter values of recurrent pregnancy loss patients compare to normal individuals and to rule out statistical difference.

Materials and Methods

Ethical clearance was obtained from the institutional ethical committee at Madras Medical College - Rajiv Gandhi Government General Hospital, Chennai. The fingerprints were obtained by the method as suggested in Home office 1960 [8].

The present study has been carried out on 200 individuals all above 25 years of age group. The sample included 100 patients with confirmed recurrent pregnancy loss from- Rajiv Gandhi Government General Hospital, Chennai. The finger prints were obtained from both outdoor as well as indoor patients. While selecting patients, all cases with doubtful diagnosis of any genetic disorder were excluded. The control group constituted of 100 healthy normal females all above 25 years of age without any hereditary diseases or genetic disorder. The finger prints were collected from the subjects, after clearly explained the nature and purpose of the study. All the patients were asked and got their palmer dermatoglyphic impression on plain white A4 paper used the ink method. In this method ink was applied on the patient's fingers. The prints pattern of the fingers were taken by roll on technique, where the coated fingers were rolled from the one edge of the finger to the other end on a A4 paper [9]. The person fingers patterns can be documented on the sheet for further analysis. Each finger print was examined with a hand lens to identify the finger print pattern [10]. The subjects were asked to clean their hands with soap & water and to dry them but leave some moisture.

The Parameters Studied Were

- The digital pattern-loop- ulnar loop/ radial loop/ whorl/ arch

Study design

- Cross sectional study

Sample size

- 200

Results

In the present study, carried out on 100 Recurrent Pregnancy Loss cases as compared to 100 controls, were analyzed for the general prevalence of different finger print patterns, of these Recurrent pregnancy loss cases 5.65% were found to have Radial loops, 52.72% were found to have Ulnar loops, 30.18% were found to have whorls and 11.45% were found to have Arches (figure-1) (Table-1).

The result obtained from the controls 5.15% were found to have Radial loops, 60.15% were found to have Ulnar loops, 28.25% were found to have whorls and 6.45% were found to have Arches (figure- 2) (Table-1). Recurrent pregnant loss cases ulnar loop was found more and there was significant decrease in frequency of Ulnar loops of recurrent pregnancy loss patients as compared to controls.(figure- 3) (Table-1).

Table 1: Distribution of Finger Print Pattern in Recurrent Pregnancy Loss Cases & Control Group

Patterns	Recurrent Pregnancy Loss	Controls
Radial Loops	5.65%	5.15%
Ulnar Loops	52.72%	60.15%
Whorls	30.18%	28.25%
ARCHES	11.45%	6.45%

PERCENTAGE OF PATTERNS

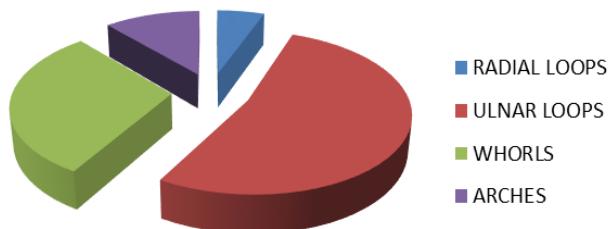


Fig 1: Chart Showing Recurrent Pregnancy Loss Subjects

PERCENTAGE OF PATTERNS

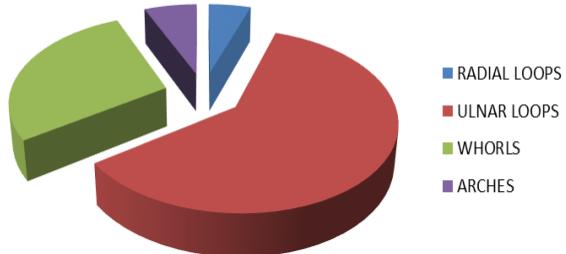


Fig 2: Chart Showing Control Subjects

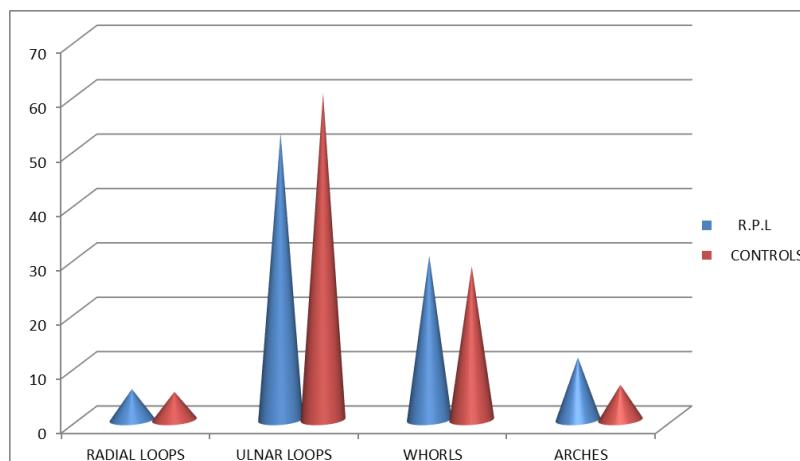


Fig 3: Comparison of Recurrent Pregnancy Loss with Control Subjects

Discussion

Dermatoglyphics is a growing discipline and its easy and ready applicability renders it as a useful tool to the clinician. The relevance of dermatoglyphics is not to diagnose, but to prevent by predicting a disease; not for defining an existing disease, but to identify people with genetic predisposition to develop certain diseases [11]. Heredity plays an important role in the formation of dermatoglyphics patterns. The inheritance of dermatoglyphic traits was initially studied by Galton in 1892, Wilder in 1902, Penrose in 1954 and Holt in 1968 [12].

Recurrent pregnant loss cases ulnar loop was found more and there was significant decrease in frequency of Ulnar loops of recurrent pregnancy loss patients as compared to controls.(figure- 1) (Table-1) Very less research has been done on dermatoglyphic features in recurrent pregnancy loss. Hence, the present study is undertaken to find out various dermatoglyphic features in recurrent pregnancy loss patients and compare them with normal individuals.

Conclusion

There is very less study done on dermatoglyphic features in recurrent pregnancy loss. Dermatoglyphics is an upcoming integral part of forensic science and medicine. The results of our present study depicted correlation between recurrent pregnancy loss and ridges. In our present study, Recurrent pregnant loss cases ulnar loop was found more and there was significant decrease in frequency of Ulnar loops of recurrent pregnancy loss patients as compared to controls.

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