

## **Dermatoglyphics in Hypertension**

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### **Abstract:**

**Introduction:** Dermatoglyphics is the term applied to the scientific study of fingerprint and palmar patterns along with their quantitative measures. Essential hypertension is sustained high blood pressure not attributable to a single cause but reflecting the interaction of multiple genetic and environmental influences. Fingerprints are known useful genetic markers in some congenital and clinical diseases; as such this study was aimed at determining the association of fingerprint patterns in hypertensive patients.

**Materials and methods:** The present study was carried out with hypertensive patients attending the outpatient clinic of Saveetha dental college and Hospitals and was compared with a control group with normal blood pressure. The subjects were 50 clinically diagnosed patients with hypertension and 50 subjects who were non-hypertensive with no family history of hypertension.

**Results:** The fingerprints were analyzed and results obtained with the p value: 0.001 (<0.05). Hence, significant.

**Conclusion:** In conclusion, the present study indicates, there is association between fingerprint patterns with the hypertensive patients.

**Keywords:** Dermatoglyphics; Essential Hypertension; Fingerprints; Innovative technique.

### **Introduction:**

Dermatoglyphics has proved to be a very important tool used for identification of many gene-linked abnormalities or diseases. Dermatoglyphic features begin developing during early stages of fetal life and are fully formed by the end of the fourth month of intrauterine life, and very importantly, they do not change throughout postnatal life(1). Hypertension is a common condition in which the long-term force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease(2). Hypertension is a major contributor to the global burden of disease and mortality. Furthermore, it is a significant cause of global mortality. The science of dermatoglyphics involves the study of epidermal ridges present on the surface of palms, fingers, soles and toes(3). These epidermal ridges form well-defined patterns that characterise individuals and they have been found useful in the clinical diagnosis of hereditary diseases(4). Epidermal ridge patterns form early in fetal development and they remain unchanged throughout life and hence they could be used to indicate gene abnormalities(5). Hypertension is one of the most common diseases in the world affecting an estimated 20 percent of the adult population and it is associated with high risk of morbidity and mortality(6). It is a condition with genetic influence. It is defined as sustained high blood pressure not attributable to a single cause but reflecting the interaction of multiple genetic and environmental influences, such that siblings of hypertensive parents or parents stand a higher chance of developing hypertension in later life(7). Essential hypertension is defined as sustained high blood pressure not attributable to a single cause but reflecting the interaction of multiple genetic and environmental influences, such that siblings of hypertensive parents or parents stand a higher chance of developing hypertension in later life(8). Essential hypertension could be caused as a result of genetic and environmental influences(9). 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 the genetic predisposition to develop certain diseases(10). Some studies have identified the existence of variations in different ethnic groups (11). Various authors have also reported the existence of peculiar dermatoglyphic characteristics in genetic disorders, malignancies and some other idiopathic diseases.

Our team has extensive knowledge and research experience that has translated into high quality publications (12-17)(18-24)(25-29). The aim of this study therefore, was to determine the dermatoglyphic patterns of subjects with hypertension.

**Materials & Methods:**

Fingerprints were collected from the 50 hypertension patients and 50 non- hypertensive patients from Saveetha dental college and hospitals. Fingerprints were recorded on a plain white paper with a stamp pad and each fingerprint assessed with Gender. Ethical approved by Saveetha dental college and Hospitals. The study design was cross-sectional study.patients of either sex diagnosed as a case of hypertension belonging to any blood group and any ridge pattern of finger prints were included in the study.Impression of all fingerprints were taken. The objective of this study is to investigate the relation between the dermatoglyphic pattern and hypertension.

**Results:**

The fingerprints of Right hands were taken in a white A4 sheet separately. The number of loops, arches & whorls patterns present in Right hands were observed and the data was analyzed.

**Table 1:** The loop pattern in the right hand of patients with hypertension were found to have higher percentages compared to the controls.

Groups	Loop pattern of right hand
Hypertensive patients	70%
Non-hypertensive patients	63%

**Table 2 :**The whorl pattern in the right hand of controls without hypertension were found to have higher percentages compared to the cases.

Groups	whorl patterns of right hand
Hypertensive patients	45%
Non-hypertensive patients	60%

**Table 3:** The arch pattern in the right hand of patients with hypertension were found to have higher percentages compared to the controls.

Groups	Arch pattern in right hand
Hypertension patients	42%
Non-hypertensive patients	35%

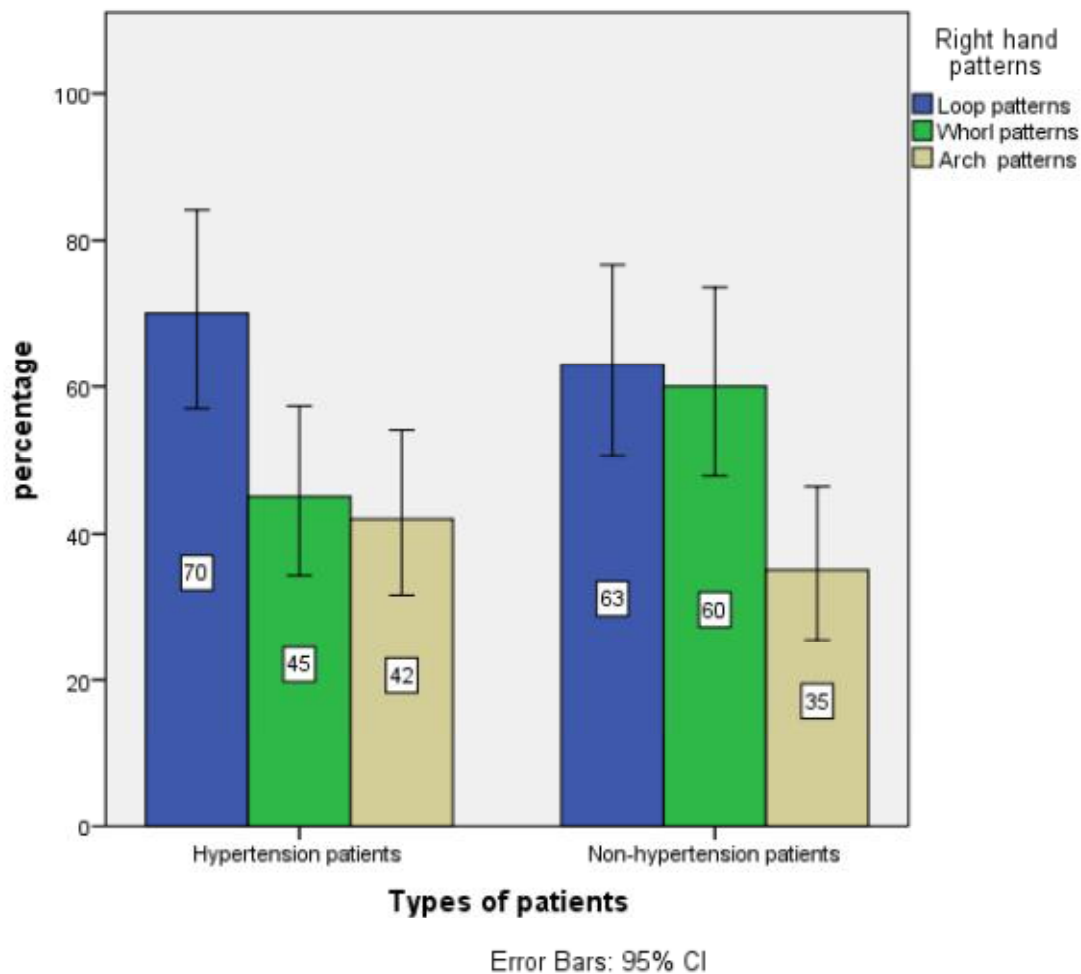


Figure 1: Bar chart represents association between Groups and patterns of Fingerprints. X-axis represents Groups and Y-axis represents the loop pattern (blue); whorl pattern (green) and Arch pattern (yellow) . A Chi-Square test was done and was found to be statistically significant. Pearson's Chi-Square: 1.010, p value: 0.001 (<0.05). The predominance of loop pattern in the right hand in hypertensive group as compared to the non- hypertensive group was found to be statistically significant.

#### Discussion:

Most studies have shown the ulnar loop as having the highest percentage in normal population followed by whorl, arch and radial loop. Our observation in this present study was in agreement with most of these earlier studies as the loop pattern was predominant followed by Arch and the least was whorl Tables 1-3. Table 1 : shows the loop patterns on the right hands of hypertensive and non-hypertensive respectively, the results is as it showed a higher frequency in hypertensive patients. Table 2: depicts whorl pattern in hypertensive and non-hypertensive respectively, the results showed a higher frequency in non-hypertensive patients. Tables 3 : shows the Arch patterns on the right hands of hypertensive and non-hypertensive respectively, the results revealed a higher frequency in hypertensive patients. In our study, we found that the loops & arches pattern was found to be in higher percentages in the right hands of patients with hypertension compared with controls. This result was in accordance with the similar study done by (30). (31), where the author found that hypertensives were found to have more ulnar loops and stated that the statistically significant increase in the percentage of loops & arch patterns in hypertension patients compared to controls. A previous study done with using 100 hypertensive patients attending outpatient clinics in Lahore showed the whorl pattern of fingerprints having 67%, patients with Loop pattern were twenty eight (28%) and pattern of composite was 5%, no patient had arch pattern(32) The two studies however did not use non hypertensive groups for comparison. This was also in contrast to the work of (33) who worked on essential hypertension and revealed that the whorls fingerprint pattern was more common in hypertensive than the loop. In another study done by (34). The findings were quite similar to the study of (35), who observed a significant difference in the ridge count of the right hand of female diabetic subjects and the male diabetic patients. (36), who reported that the percentage frequency of whorl digital pattern in both male and female essential hypertensive patients was significantly higher than the normal males and females, and that the whorl pattern on the right

hands was strongly associated with essential hypertension patients. According to (37) done in Mangalore population were found to have a higher frequency of whorls patterns followed by arch and least is loop pattern. The previous study discussed Loop patterns was found to be significantly present in cases with hypertensive than controls and it is commonly seen in hypertensive women(38).A similar study shows arch pattern is almost equal in both hypertensive and non-hypertensive patients(39). (40)discussed that whorl patterns are higher in hypertension than non-hypertensive patients.

**Conclusion:**

The present study results showed higher loop and arch patterns in hypertensive patients compared to non-hypertensive patients. The non-hypertensive patients were found to have higher whorl patterns compared with hypertensive patients. Hence, Dermatoglyphics patterns can be used as an earlier marker to detect hypertension. The loop pattern in the right hand was found to be predominant in hypertensives as compared to non-hypertensives and can be explored for further study at a larger scale.

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**Conflict of Interest:**

The authors declare that there was no conflict of interest.

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