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Case Report

The connection between unhealthy weight and patterns of fingerprints.

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Abstract

The objective was to use statistical analysis to investigate the fingerprint patterns on all fingers of both hands and the relationship between obesity and fingerprints among students in various Koya University faculties. The study of stratum ridges in the fingers, palms, and soles and their configurations—dermatoglyphic (derma = skin + glyph = carving)—is the foundation of dactylography, or the fingerprint system. estimates that the odds of two people having identical finger impressions are roughly one in 64,000,000. The mix of environment and arbitrary heredity determines the ridge pattern. We recruited 120 participants for our study, which was done across several Koya University faculties.

The ten fingerprint patterns were separated into three categories: loop, whorl, and arch. The fingerprint was captured using a stamp pad to imprint the ridges of the fingerprint on white A4 paper.

The fingerprint pattern's overall distribution revealed that the loop had a high frequency (58.41%), while whorls and arches had intermediate and lowest frequencies (37.83%) and 3.75 percent, respectively. For both individual males and females, loops predominate in both normal and obese states. Although the study indicates a correlation between fingerprint pattern and obesity, a statistical analysis using the chi-square test yielded no such correlation when the results were merged for both genders.

Keywords : *fingerprints, obesity, hands, loops, arches and whorls*

Introduction

The additional adipose tissue that characterises obesity is a major cause of illness and mortality because of numerous weight-related problems. Evolutionary and mechanistic viewpoints have been used to investigate the biological basis of this issue (Lizar 2005). The body mass index is calculated in order to determine the traditional clinical cut-offs for diagnosis. Overweight is defined as 25–29.9 kg/m, obesity as 30–34.9 kg/m, and severe obesity as 35 kg/m. Over 430 chromosomal regions include gene variations linked to the regulation of body weight and the development of obesity.

Secreted molecules include the hormone leptin and the cytokine tumour necrosis factor alpha. Other molecules include hormone-sensitive lipase, which acts on lipolysis, uncoupling protein 2, which acts on mitochondria energy expenditure, and peroxisome proliferator-activated receptor gamma and, potentially, INSIG2 acting in adipogenesis. Major genes associated with obesity are found on chromosomes 2, 10, 11, and 20. Investigations into potential genes suggest that the minor obesity genes regulate key adipose tissue processes, and that structural variations in these genes may modify adipose tissue function in a manner that contributes to obesity. The study of stratum ridges and how they are arranged in the fingers, palms, and soles is the foundation of dactylography, or the fingerprint system.

The likelihood of two people having the same finger impression is estimated to be one in sixty-four thousand million. The mix of environment and heredity influences the ridge pattern. The relationship between the ridge pattern and so-called volar pads, which are anatomical features, has long been established. Volar pads are transient eminences of the volar skin that appear at the fingertips, in the thenar and hypothenar regions, and on the distal portion of the palm between the digits at around the seventh week. In human embryos, the volar pads become less noticeable during the tenth week and eventually vanish.

Based on the variance in fingerprint patterns and total finger ridge count, the study of fingerprints has proven helpful in the investigation and identification of specific illnesses and syndromes. Clinicians have become more interested in using

dermatoglyphic analysis in medicine in recent years (Smail et al., 2019). Epidermal ridge patterns play a role in twin zygosity determination in anthropological surveys and population genetics, as well as in the diagnosis and classification of specific congenital malformation disorders.

MATERIAL AND METHODS

MATERIALS

The study was carried out on students at Koya University from November to December 2019. A maximum of 120 students, aged between 18 and 25, were randomly chosen for the study (30 normal weight females and 30 obese females, and 30 normal weight males and 30 obese males). A sheet of white paper was separated into four areas: thumb, index, middle, and fingerprinting; the sections were then divided into five columns and labelled right and left hand for both male and female normal and obese. The 45 x 35 mm stamp pad from the horse firm is utilised. After cleansing hands with tissue paper, the fingerprint was used to remove any remaining dirt. For both normal hands and male and female obesity, each right and left hand was rolled, and a plane print was taken. The pattern of fingerprints (loop, whorl, arch). Everyone collected length and weight data for this investigation in order to establish each person's standard and level of obesity before taking their fingerprints. Taking into account obese and normal according to the National Health Institutes.

PROCEDURE

1. Every participant was instructed to thoroughly wash his hands with soap and water and pat dry with a towel.
2. To transmit his fingerprint impression, press his fingertip first on the stamp pad and subsequently on the paper. Every finger on both hands was treated using the same procedure twice.
3. Each of the ten fingers' plain fingerprints was captured independently on its own block on a single piece of paper.
4. Care was taken to ensure that the finger did not slip and smudge the print.
5. Findings of fingerprint cases from both normal and obese people are documented.

STATISTICAL ANALYSIS

For both male and female (normal and obese) right and left hands, the chi-square test was used to investigate the association between obesity and fingerprint. A P-value of less than 0.05 was deemed statistically significant.

DISCUSSION

This study shows the relationship between gender, fat, and dermatoglyph distribution (dactylography, fingerprint). There were 120 individuals in all, 60 male (30 normal, 30 obese) and 60 female (30 normal, 30 obese), recruited at random from Koya University. Primary fingerprint patterns for both sexes are often distributed over all fingers on both hands. The fingerprint indicates that there are more loop kinds than whorl and arch types. With around 65% of all fingerprints, loops are the most prevalent form. A loop is created when one or more ridges from one side of the pattern recurve to exist from the same side as the point of entry. The fingerprint whorls pattern might be round, oval, or spiral or any variation of a circle, making up roughly 30% of the total. Conversely, arch patterns are the most basic yet are uncommon (approximately 5%). According to Azhagiri et al. (2018), the fingerprint pattern consists of ridges that cross over from one side of the print to the other without curving back.

Based on the kind of fingerprint, the average was 63.33% for normal males, 52% for obese males, and 34% for whorls in normal males, 42.66% for obese males, and 2.66 percent for archs in both types. Based on the type of fingerprint, the average for both normal and obese males and females was 65.33 percent; for whorl types, the average was 28 percent and the average was 41.33%; for arch types, the average was 6.66 percent and the average was 7.33%. The loop has a higher average than the other types of fingerprints, and the variables don't relate to one another. Depending on the type of fingerprint, the percentage of loops was 50.66% in normal, 64.66% in obesity, 48% in normal and 32% in obesity, and 3.33 percent in normal and obesity, respectively. There is a relationship between the variable in the whorl and the P-value.In the thumb finger, the normal loop has a larger average number than the obese loop, while the normal index finger has a larger average number than the obese finger, the normal middle finger has a larger average number than the obese finger, and the normal little and ring fingers have larger average numbers than the obese fingers.

The P-value indicates that there is no relationship between the variables. There is no correlation between the factors and a higher average number in the thumb finger, a bigger average number in the index and middle finger, a larger average num-

ber in the finger than in obesity, and a larger average number in the small finger obesity than usual for whorls in obesity. According to P-value, the arch is (0.01), indicating that there is a relationship between fingerprint and obesity. The arch in normal and obesity is equal, which is (0 percent) in the thumb, and an index, obesity has a greater average number than regular, even in the middle, which is equal, and the average number in ring and tiny is greater than in obesity. and fat The normal loop average number in all fingers has a wider range than the obese The obesity has a higher number than normal in the whorl average number in all fingers. According to the P-value, the thumb arch has a larger range than the normal, the index finger has a larger range than the normal, the middle finger has a smaller range than the normal, the range is equal in the ring finger, and the little finger has a larger range than the normal. Arch were (0.00) this mean that there is a pure relation between fingerprint and obesity.

The usual range for loop type in the thumb is more than that of obesity, however the normal range in the other fingers is less than that ofWhen it comes to whorl type, the typical range is smaller in the thumb than it is in obesity, but it is larger in the other fingers (index, middle, ring, and little). Depending on the P-value in whorl and arch, the variables have a relationship between them. In thumb, ring, and little arch, the average number is equal, which is 0%; in index normal, it is 0% and has obesity (6.66%); in middle normal, it is 10% and has obesity (3.33%). The average number of loops in all fingers is higher in obesity than in normality. The thumb has a normal whorl, and obesity has an equal whorl of 40% in other fingers. The normal has a larger range than the obesity in the thumb arch. In the index, the normal was 0% while the obesity was 10%. In the middle, the ranges of the two are equal, and in the ring, the normal was 0% while the obesity (3.33%) was equal in the little range. The P-value in the whorl type indicates a relationship between the variables.

CONCLUSION

In summary, a correlation was observed between the distribution of fingerprint patterns and the obesity of the whorl in the left hand of people who were normal weight and those who were obese. However, only the correlation between the arches in the right hands of female participants and the hands of normal and obese male subjects from different fingers exists, indicating that the ability to predict obesity based on fingerprint analysis is possible.

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