

Photographic Method in Dermatoglyphics Analysis

StelinWersely. A. M¹, Manjunath. K. Y², Kumar. K. V³, Vrijakumari. C. R⁴

¹(Department Of Anatomy/ Kerala University Of Health Sciences, India)

²(Department Of Anatomy/ Vinayaka Missions University, India)

³(Department Of Anatomy/ Kerala University Of Health Sciences, India)

⁴(Department Of Anatomy/ Kerala University Of Health Sciences, India)

Abstract: The significance of palmar and digital ridges have brought into light by Cummins and Midlowin 1943, since then the field of dermatoglyphics has improved a lot in the field of personal identification. Now a day's its use as a tool in early diagnosis of various psychological, medical and genetic conditions. But it could be implemented only by taking print of the hand by a conventional method called 'ink method'. But it has so many many disadvantages which is the main barrier for its wide use. Inorder to overcome this barrier we implemented a way new stain less, strain less, user and subject friendly method – 'Photographic Method'

Keywords: Dermatoglyphics, imagej, ink method, photographic,

I. Introduction

Dermatoglyphics is the study of palmar and plantar dermal ridges. These ridges are regarded as they develop and differentiate at early foetal life. The ridge configurations are genetically determined. It is useful in anthropometric, medico legal and also accepted in determining various genetic disorders.

The conventional method of dermatoglyphics analysis is 'ink method' which has lot of drawbacks. The ink method is not subject and user friendly. As the ink is not washable so it makes lot of chaos over the hands of the subject and embarrassment to the user. Few alternative methods [2,3,4] have been introduced over years which are more complicated than ink method. In order to avoid that chaos we introduced the new method called 'photographic method' which is perfectly subject and user friendly. The photographic method is convenient, easy, less time consuming, effective, excess clarity, perfect calibration and economical.

II. Methodology

The photographic method was perfected and steps documented. 100 school students were selected and segregated according to the age groups and dermatoglyphic method is performed by both conventional ink method and photographic method. The data obtained were analysed and compared for effectiveness and ease.

The photographic method is so simple which requires only a digital camera. We can even use mobile camera with more than 10mp of resolution for this purpose. The procedure is to capture the photographs of the subjects palm and medial four digits and first digit separately for better clarity. The subjects are asked to wash hands cleanly in order to remove debris. Then the hand is placed under well-lit surface and a scale is placed near the hand and the camera is adjusted and obtained better clarity pictures. The obtained photographs can be zoomed and checked for perfect clarity. If any spot of blur got identified then it can be retaken immediately.

Conventional ink method is performed on the same subjects by using printer ink, roller, inkpad, cotton and bond paper. Then the obtained picture and print was analysed for finger print pattern, finger ridge count, a-b ridge count, and angle. The image obtained by photographic method is analysed by using 'ImageJ' software, that provide perfect zoom and tools for measurements, counting and to obtaining angle.

III. Discussion

The conventional ink method is the most common method used for dermatoglyphics analysis. But everyone who has used that method must be familiar with its tremendous disadvantages. The subjects are so hesitant when they hear about the spreading of ink on their palm that makes embarrassment to researcher also. The researcher feel very much uncomfortable as the patches of ink spoils his own hands that make him unable to touch anything around, which also makes the white sheet for taking print dirty. So the sticking nature of ink makes it impossible to perform without an assistant to help.

Some of the other methods which have been tried are 'Scotch-tape India-ink' method² which is an inkless method using sensitizing fluid, adhesive tape, powder, and carbon paper. Recent "hi-tech" methods are generally computer based and begin by scanning prints with a video camera followed by digitizing the print features which are then subjected to analysis. Okajima (1975)⁴ developed a method to study ridges on the dermal surface instead of the epidermal surface using chemical treatment and staining with toluidine blue that

can be done even in fetuses from the 14th gestational week. Misumi et al (1984)³ used scanning electron microscope. Others have used Rubber and Plaster of Paris casts also. These methods are costly or cumbersome.

The photographic method which we have introduced is so convenient, as it won't involve any ink pad, roller, printer ink, adhesive tape, powder carbon paper, scanner, stains or anything that is inconvenient. It is very user and subject friendly, harmless, clean, affordable, very less time consuming, strainless, stain less method. Time and stain are the two appreciable factors in this method.

As we are not using any stains in photographic method like printer ink, lip stick^[5], toluidine blue etc, this method is completely free from stains so the subjects are extremely cooperative and its only matter to show the palm and digits still for some seconds. This makes the researcher to feel more confident to pursue the procedure. Time is another discernible factor as the photographic method requires only 1/10th of time compared to conventional ink method, so that we can do more number of samples in limited time. It is very much cost effective as it can be done with our own camera and no need to rush into shops to buy various items as in other methods.

Analysis of the samples which we obtain by the use of new photographic method is very simple because in other methods clarity and overlapping of ink or other stains are main factor to make it hard to analysis and it is so hard to visualise so hands lens can be used thus it increases the strain of the eyes. But in photographic method the pictures will be at most clarity and it can be zoomed to any level to visualise it. And the counting and obtaining the angle can be done with the help of software like 'imagej'

Figures and Tables

Figure - 1



Figure – 2

Palmar analysis

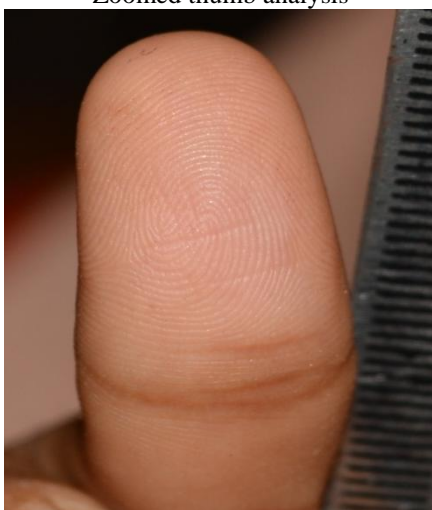


Figure – 3

Medial digits analysis



Figure – 4
Zoomed thumb analysis



V. Conclusion

Thus the photographic method is strain less, stain less, very cheap, subject and user friendly when compared to any other method used so far in dermatoglyphic analysis. So this would be the perfect tool in any dermatoglyphic analysis especially for early diagnosis.

References

- [1]. Cummins, H., & Midlow, C. (1943). *Finger prints, palms and soles: An introduction to dermatoglyphics*. Philadelphia: The Blakiston Company. Philadelphia.
- [2]. Cotterman C. W., A scotch-tape India-ink method for recording dermatoglyphics, *Am J Hum Genet.* 1951 December; 3(4): 376–379.
- [3]. Misumi Y, Akiyoshi T. Scanning electron microscopic structure of the finger print as related to the dermal surface. *Anat Rec.* 1984 Jan; 208(1):49-55.
- [4]. Okajima M., Development of dermal ridges in the foetus, *J Med Genet.* 1975 Sep; 12(3):243-50.
- [5]. Roopam K Gupta and Aruna K Gupta, New, easy and effective method to take dermatoglyphic prints, *National journal of medical research*, Jan – March 2013; 3(1) Page 45-47