

Dermatoglyphs in Oculocutaneous Albinism

Sudip Datta Banik¹ and D.P.Mukherjee²

1. Department of Anthropology, Vidyasagar University, Medinipur, West Bengal, India

E-mail: sdbanik@hotmail.com

2. School of Human Genetics and Population Health (SOHGAPH), Kolkata, West Bengal, India

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ABSTRACT Oculocutaneous albinism can be defined as a syndrome characterised by inherited lack of pigmentation in skin, hair and eyes, along with weak visual acuity, nystagmus, photophobia and other health complications. 13 individuals were identified to be affected with OCA in 9 families from the population of Kolkata and Howrah cities. The dermatoglyphic patterns of the patients were compared with their near relatives who were obligate and doubtful heterozygotes and 23 distant relatives. The data of such a rare condition showing an association with dermatoglyphs bring out the importance of the study in this rare abnormality.

INTRODUCTION

Oculocutaneous Albinism (OCA) is defined as a group of syndromes, characterised by inherited lack of melanin pigmentation in eyes, skin and hair along with reduced visual acuity, nystagmus and photophobia and other health complications (Mukherjee et al., 1996). Ocular Albinism (OA) is an X-linked trait and the ten other autosomal types of OCAs (Witkop et al., 1989), distinguished by biochemical, clinical and ultrastructural characteristics are found in different populations. But uncertainties regarding their allelic differences and interrelationships call for further investigation.

Dermatoglyphs on fingers in OCA patients provide a new dimension for investigation into the inheritance and heterozygote identification and genetic epidemiological study of the OCA in the populations. In view of the rarity of the trait, and the absence of dermatoglyphic data, this preliminary observation of dermatoglyphic variation is important. Therefore, the dermatoglyphic characteristics on the palms of OCA patients have been undertaken in the present study.

MATERIAL AND METHOD

13 clinically and genetically established OCA affected individuals (6 males and 7 females) along with 23 unaffected individuals as controls, including obligate and doubtful heterozygotes belonging to 9 families and their other relatives, used as controls, out of the total populations of Kolkata and Howrah cities of eastern India have been examined. The features of both right and

left hands are added together to obtain the values for the individuals.

RESULTS AND DISCUSSION

13 individuals (6 male and 7 female) were detected to be suffering from the homozygous oculocutaneous albinism. They are compared with their 23 near relatives including obligate and doubtful heterozygotes in the 9 families studied in this sample.

The Mean values of main line indices (MLI) are compared between the patients, heterozygotes and controls.

There is a trend of depression in the MLI values in comparison with the unaffected controls. It also appears to be in excess in male patients than female (Table 1).

The ab ridge-count appears to decrease in the OCA patients in comparison with their relatives. The female sample, however, apparently do not show the trend. The sex difference is, however, quite apparent in terms of higher standard deviation in the total sample (Table 2).

Table 1: Comparative data on MLI on OCA homozygotes and heterozygotes

Sex	n	Affected OCA	n	Controls
Male	6	19.2 ± 1.4	11	19.3 ± 0.84
Female	7	18.3 ± 1.3	12	20.0 ± 0.83
Total	13	18.7 ± 0.9	23	19.7 ± 0.6

Table 2: The mean values of ab ridge-count in OCA patients and their relatives.

Sex	n	Affected OCA	n	Controls
Male	6	69.3 ± 2.2	11	70.5 ± 2.1
Female	7	65.0 ± 3.1	12	64.8 ± 3.8
Total	13	67.0 ± 2.0	23	67.5 ± 2.2

On the whole, there is a tendency of the OCA patients to have a reduced ridge-breadth in the ab region compared to their unaffected relatives although in the female sample the difference is not apparent. The sex difference in ridge-breadth is demarcated by a higher standard deviation in the total samples than in either sex (Table 3).

Table 3: The mean values of ridge-breadth as measured from the ab ridge-breadth per mm. of ab distance in mms. In OCA patients and their relatives.

Sex	n	Affected OCA	n	Controls
Male	6	11.3 ± 0.4	11	12.0 ± 0.4
Female	7	12.0 ± 0.6	12	12.0 ± 1.0
Total	13	11.7 ± 0.4	23	12.0 ± 0.6

The ridge-count of the patients of OCA appear to show an increase in the td distance area of the palms over the unaffected relatives. This trend is true for both the affected male as well as female OCAs when observed separately and also when compared between total OCA patients (both male and female) and the unaffected relatives (Table 4).

Table 4: Mean differences in td count in OCA patients and their relatives

Sex	n	Affected OCA	n	Controls
Male	6	205.0±17.2	11	175.8±17.5
Female	7	186.0±15.8	12	177.5±11.3
Total	13	194.5±11.5	23	176.7±10.0

The mean maximal atd angle is the maximum in the patients of OCA, the value slightly decreasing in controls. The sex difference in this character is generally observed with values exceeding in females (Table 5).

The mean values of the adt angle are slightly reduced in the patients of OCA. Quite a lot of sex difference is also seen, the males generally exceeding (Table 6).

Table 5: Mean values of maximal atd angle in patients of OCA and their relatives.

Sex	n	Affected OCA	n	Controls
Male	6	88.7±6.7	11	85.5±3.3
Female	7	93.9±2.6	12	91.1±3.5
Total	13	91.5±3.6	23	88.4±4.5

Table 6: Mean differences of maximal adt angle on the palms of OCA patients and their relatives.

Sex	n	Affected OCA	n	Controls
Male	6	162.5±2.4	11	163.0±3.3
Female	7	152.6±2.6	12	162.8±3.5
Total	13	157.2±3.6	23	162.9±4.7

CONCLUSION

In 13 patients of OCA, the MLI appears to decrease, the ab ridge-count and ridge-breadth in the ab region also decreases in comparison with their relatives. This result, even in a small sample, is quite impressive. The mean maximal atd angle, the adt angle and the td ridge-count also tend to increase on the palms of OCA patients. Normally td ridge-count and maximal atd angle shows an opposite trend of variation. But the difference in adt angle may explain the differences observed in the present sample. A systematic study of the phenomena in a larger sample seems necessary for a conclusive analysis of the palmar dermatoglyphic trend in the OCA.

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