

Analysis of geographic variation in the South Indian dry skulls using cranial index

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ABSTRACT

Introduction: The cranial index (CI) of the dry South Indian skulls can be used to segregate them geographically. Thus, the aim of the study is to determine and analyze the geographical variation in dry South Indian skulls using CI. **Materials and Methods:** A total of 50 skulls are taken from the Department of Anatomy and were been evaluated which are from unknown sex. The method of calculation is done by taking the length of the skull, breadth of the skull, and the CI of the skull which are taken with Vernier caliper and calculated. **Results:** According to data observed on skull, they are classified based on the CI value. The dolichocranic skulls are skulls with CI up to 74.9 or below 75.0. The mesocranic skulls are skulls with CI between 75.0 and 79.9. The brachycranic skulls are the skulls with CI between 80.0 and 84.9. **Conclusion:** The conclusion of the study is that most of the skulls of the South Indian population were under the dolichocranic skulls.

KEY WORDS: Brachycranic, Cranial index, Dolichocranic, Geographical variation, Mesocranic, Skull

INTRODUCTION

Cranial index (CI) the ratio of the breadth of the skull and length of the skull and multiplied by 100. The breadth of the skull is the biparietal distance and the length of the skull is the fronto-occipital length of the skull.^[1] The study mainly involves in the finding and dividing them based on the shape, size, and structure without any sex determination.^[2] The process of measuring the skull was been done using a Vernier caliper. The CI also changes accordingly with the change in the countries as types of skulls differ.^[3] The CI is calculated to find the different types of skulls from the different methods used.^[2,4] The maximum length is from the occipital point and glabella. The cranial breadth is the greater breadth at the right to the left.^[5] The skull was numbered and the calculations were done according to the skulls shape and size.^[6] Then, skull gets its shape from the fetus. The growth of the human skull includes many factors which maintain the skull structure and composition.^[7]

The cephalic index also plays an important role in the racial difference.^[8] These data are also important for the

forensic medicine for the researches to continue for any type of upcoming research.^[9] Much attention has been given in the variations of the shape and size of the human skull and efforts have been made to associate these variations to characterize different races.^[10] Careful, skilled examination of body remnants can put forward valuable information that may help in the identification of a person.^[11] The skull is a part of skeleton that is very suitable for examinations with regard to identification. The skull without the mandible is regarded as cranium.^[12]

Establishment of factors such as sex, race, age, and stature from the available human remains may contribute toward an approximation of identity and the consequent report accepted as evidence in court of law subject to testifying its veracity. Cephalic index formed one of the frequently employed parameters in physical anthropology to identify the races.^[13] It is a matter of common experience that in dealing with crania of different racial types, an impression of racial affinity and differences is seen. Skeletal metric and non-metric variables are widely used for such studies.^[14,15] Measurements play an important role in skeletal morphology. Cranial measurements have been used to describe individuals and to correlate various ethnic and racial groups. These measurements have also shown the shape and size variations in different racial groups.^[16]

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Table 1: Types of CI

Dolichocranic	74.9–75.0
Mesocranic	75.0–79.9
Brachycranic	80.0–84.9

CI: Cranial index

Table 2: Sum and average of CI

Sum	3026.79
Average	75.66975

CI: Cranial index

CI and cephalic index (in living) are useful anthropologically to find out racial and sexual differences. It is important in anthropometric indices, in diagnostic knowledge between the patient and normal populations, and in the medicolegal cases of forensic medicine. The craniometric results can also be of great assistance while evaluating patients in various fields of medicine such as medical imaging, pediatrics, craniofacial surgery, and also for studying growth trends in various castes/races within a defined geographic zone.^[17] The observations and findings of this study will provide platform for similar extended craniometric studies based on various communities/castes/races of particular geographic zones.

MATERIALS AND METHODS

A total of 50 skulls were used for the calculation of the South Indian skull. They were been calculated using the CI formula: Breadth of the skull divided by length of the skull and multiplied with 100. The skull biparietal distance and the fronto-occipital distance were found for the calculation of the CI using Vernier caliper. The length of the skull is the fronto-occipital distance and the breadth of the skull is the biparietal distance. The skulls were calculated based on the formula and the data were compiled and formed a statistical analysis and the average of the value was calculated and the graph was plotted accordingly.

RESULTS

The data obtained were compiled and analyzed. The average value was used to represent in graph as bar diagram. The dolichocranic skulls ranged about 74.9–75.0. The sum calculated was seen to be 3026.79 at the total of the CI. The average calculated was seen to be 75.66975 which was an average of CI falling under the long-headed category Table 1, 2 and Figure 1. The frontal portion and the occipital portion are been elongated which forms the long skulls were that the biparietal distance is less Figure 2 and 3.

DISCUSSION

According to the statistical analysis calculated and the graph obtained, it is been clear that the CI among the

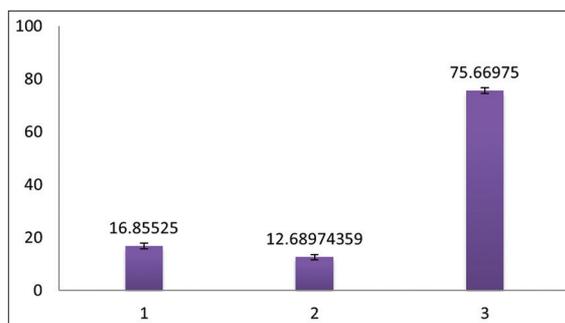


Figure 1: The skulls are long-headed skulls which fall under the dolichocranic category

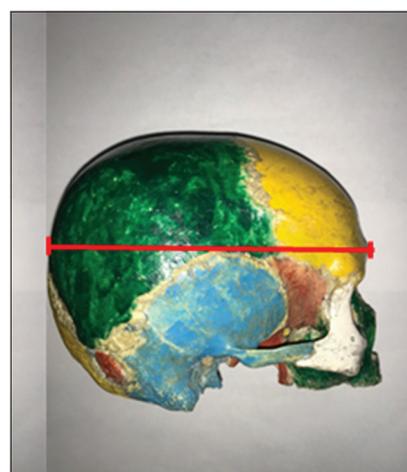


Figure 2: Measurement of cranial length

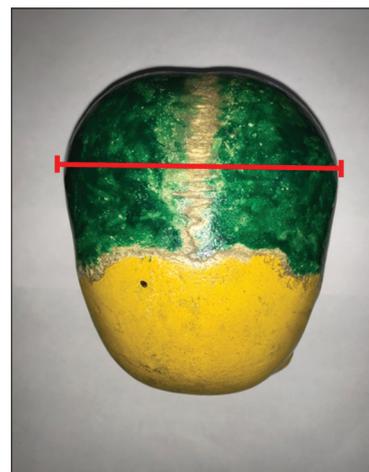


Figure 3: Measurement of cranial width

South Indian population falls under the dolichocranic skulls. The averages of the skulls were calculated to plot the graph accordingly. In recent studies, many findings are been upcoming.^[18] The skulls were found to be long-headed skulls which were the South Indian skulls of Asia.^[15] The skulls were segregated based on the classification of the skulls. According to the comparative study with the other researches, it is clear that the South Indian skulls have a CI in the category of dolichocranic.

The skulls in different researches change according to the change in the country and any other abnormal changes. The CI is formed from the different types of hormones and other metabolic changes in the skull.

CONCLUSION

The statistical analysis showed that the most of the South Indian skulls fall under the CI of 74.9–75.0 which were been called as dolichocranic skulls. This observation and study may help other various CI studies. This study was to find the difference in the CI of the skulls.

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