

Prevalence of wormian bones in dried adult human skulls of South Indian population – An osteomorphometric study

S. Padmaja, M. S. Thenmozhi, Ganesh Lakshmanan*

ABSTRACT

Aim: This study aims to understand the recurrence of wormian bones. **Materials and Methods:** The current study was conducted in Saveetha Dental College, Chennai. The skull was segregated into male and female by the differentiating features. The skulls were analyzed for the presence of wormian bone. **Results:** The wormian bone was present only in eight skulls of 33 skulls in male and was present only in five skulls of 32 skulls in female. The prevalence of wormian bone was very less in South Indian population. **Conclusion:** The prevalence of wormian bone is very less in South Indian population. It is only 19%.

KEY WORDS: Wormian bones, Dry skull, Osteomorphometry

INTRODUCTION

Wormian bones are produced due to irregular hardening focuses in different parts of the skull. Genetic and environmental factors have been proposed to clarify their development.^[1] Their occurrence fluctuates in different populations and they establish an anthropological marker.^[2]

Neurosurgeons, radiologists, and orthopedists ought to be cautious while doing clinical and surgical procedures on different head shapes.^[3] A large wormian bone at the lambda is regularly called an Inca bone (Os Incae). Wormian bones are markers for different metabolic maladies such as pycnodysostosis (abnormally thick bones), osteogenesis imperfecta (brittle bones), rickets (frail or delicate bones), Menkes disorder, and Down's syndrome.

The presence of larger number of wormian bones is a well-known radiographic indication of osteogenesis imperfecta, yet the phenotypic, genotypic relations are not all round described.^[4] In the early diagnosis of sickle cell anemia, mild symptoms of osteogenesis imperfecta

were additionally found. Early analysis of this disease will help in better administration as well as awareness of the disease with better symptom management.^[5] Wormian bones are situated in lambdoid suture, coronal suture, asterion, parietomastoid suture, occipitomastoid, sagittal, squamosal, zygomaticosphenoid, metopic, frontonasal, and frontozygomatic.^[6]

Cranial deformation is a type of body alteration in which the skull of human being is twisted deliberately. A few examines have demonstrated that cranial disfigurements will influence the recurrence of the wormian bones. Wormian bones that are present in posterior part of the skull are influenced than the ones that are present in anterior part of the skull.^[7]

Wormian bones are also called as supernumerary ossicles, intercalary, sutural, and intrasutural bones.^[8] The event of the Inca bone in the present populace of the world is commonly high, but with lesser recurrence in Indians, particularly in South Indians.^[9] The skulls were separated into male and female, and then, their predominance was noted. The male skulls had high cranial capacity when contrasted to the female skulls.^[10]

MATERIALS AND METHODS

The investigation was directed on 70 dry adult human cadaveric skulls in Saveetha Dental College, Chennai.

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Department of Anatomy, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

***Corresponding author:** Dr. Ganesh Lakshmanan, Department of Anatomy, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai - 600 077, India. Phone: +91-9894999243. E-mail: drganeshbhms@gmail.com

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All the gathered skulls were guaranteed to be free from a wide range of antemortem and postmortem injuries. The skulls were segregated into male and female skulls by the distinguishing highlights. In general, the male skulls are heavier than the female skulls, female skulls have adjusted temple head and forehead edge is much smoother in females when compared to males. Male skulls had a square jaw shape while the female skulls have a progressively pointed facial structure.

RESULTS

The wormian bones are found less in number in adult human skulls. Of 31 male skulls, the wormian bones were found only in eight skulls [Figure 1]. Of 37 female skulls, the wormian bones were found only in five skulls [Figure 2].

DISCUSSION

Wormian bones are a matter of concern from the past few years. Numerous speculations and inquiries about were conducted to clarify the arrangement of wormian bones; however, none were generally acknowledged. Some metabolic issues and ecological variables have turned out to be one reason respect to the development of wormian bones. Majority of the studies have shown that wormian bones are more in the lambdoid suture which is likewise named as post-interparietal bone or Inca bone.

Appraisal of skulls uncovered the prevalence of wormian bones among adult dried human skulls in South Indian population. As per the past investigation was done by Thanapaisal *et al.*,^[11] the prevalence of wormian bone in northeastern Thailand is 7.25%, and among males, it is 8.33%, and among females, it is 4.84%.

In RR Marathe's study, in central India, the rate of wormian bone was just 1.315%. In Chandrakala Agarwal's examination which was conducted in Rajasthan, the frequency of the wormian bone was found to be 0.99%.^[12] According to Hanihara *et al.*,^[13] there are certain provincial varieties in each topographical territory which differs due to the land design. Hence, there are variations in the incidence of wormian bones among individuals in India staying in different places.

The larger part of the event of Inca bone is high in the world yet is low in recurrence in northeastern Asians and very less in recurrence in South Indian population.^[14,15]

In the present investigation, we have also noticed a high incidence of wormian bones in lambdoid suture with high factor frequency in other populations such as 21.21% in East Indian population, 1.32% in central India, and 14% in the South Indian population.

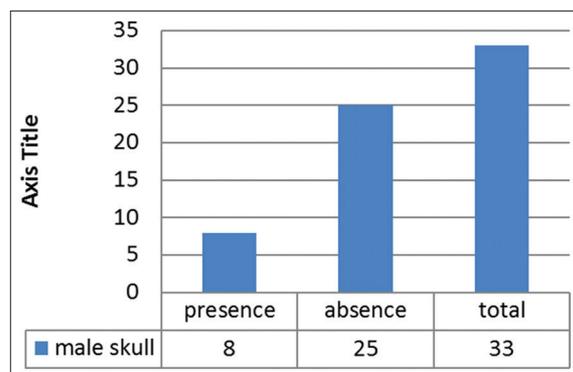


Figure 1: The prevalence of wormian bones in male skull

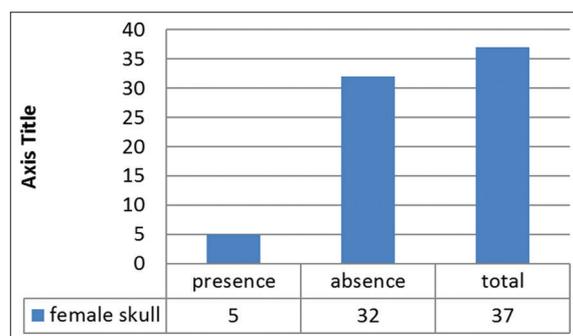


Figure 2: The prevalence of wormian bones in female skull

According to this study, the prevalence of wormian bones in South Indian population is 19%. This outcome is as per the outcomes acquired from the past examinations.

CONCLUSION

The prevalence of wormian bones is low in South Indian population. It is only 19% in South Indian population. It is found with high recurrence in lambdoid suture which is in connection with the past investigations. The knowledge of the sutural bones, their incidence, and their features illuminate the neurosurgeons and radiologists to arrive sooner than required analysis of sicknesses and their opportune administration. We hope that the present examination has proved to be useful with respect to the morphology and prevalence of wormian bones in South Indian population.

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