

A STUDY ON THE OCCURRENCE OF WORMIAN BONES AMONG THE MALE AND FEMALE SKULLS OF TAMIL NADU, INDIA

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ABSTRACT

Background: Wormian bones, also known as intra sutural bones are extra bone pieces that occur within a suture in the cranium. These are irregular isolated bones which appear in addition to the usual centers of ossification of the cranium and, although unusual, are not rare. The number of sutural bones varies considerably because different individuals and different population have different numbers of sutural bones. They occur mostly along the sutures and meeting point of the cranial sutures. They occur most frequently in the course of the lambdoid suture. They are also occasionally seen within the sagittal and coronal sutures.

Materials and Methods: In this present study we analyzed the occurrence of sutural bones among 50 male and female skulls in Tamil Nadu region and we compared the results along with the studies of Indian skulls.

Result and Conclusion: Based on the study we concluded that sutural bones are more among male skulls than in females among the skulls of Tamil Nadu and this is exactly the opposite of the results given in Indian population.

KEY WORDS: Bregma, Lambda, Pterion, Asterion.

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INTRODUCTION

Wormian bones are named after Olaus Worm, Professor of Anatomy and they are also called as ossa wormiana, intersutural bones and Inca bones/Goethe's ossicle [1]. His description of the extra-sutural bones contributed to embryology. Embryologically the points bregma, lambda, pterion and asterion are covered with membranes, called as fontanelles and will be ossified after birth.

Bregma: It is the meeting point of sagittal and coronal suture and at birth it is called as anterior fontanelle which will be closed around 18 months after birth [2]. The wormian bone at bregma is certainly a rare occurrence.

Lambda: Lambda is the meeting point of lambdoid and sagittal suture and in infants it

called as posterior fontanelle and will be closed at 2-3 months after birth. Study of skull showed a large number of sutural bones at the lambda and along the lambdoid suture [3]. A possible explanation given to the occurrence of this bone is that the interparietal part of the squamous occipital bone above the highest nuchal line develops in membrane, usually from two pairs of centres. The remaining part ossify by cartilage ossification. In some people both the parts fail to unit with each as like the normal condition.

Pterion: Pterion in infants is called as antero-lateral fontanelle and is a meeting point of four bones, the greater wing of sphenoid, the temporal bone, the frontal bone and the parietal bone. It will be closed a few months after birth. A wormian bone at pterion is called "pterion ossicle" or "epipteric bone" or Flower's bone [4].

Incidence of epipteric bone is high in Indians- 11.79%.

Asterion: Asterion in infants is called as posteriolateral fontenelle and is the meeting point of temporal, occipital and parietal bones [5]. It will be closed few months after birth. Incidence of wormian bone at asterion is more in male in Indian

Sex difference-Indian skulls: The incidence of wormian bone is more among the female skulls (64.80%) [5]. Single wormian bone was seen in 26 (14.4%) [4] skulls with equal distribution among male and female skulls.

Factors responsible: Wormian bones are present in both normal and abnormal cases. They can be found as normal variants and seem to be determined genetically in certain populations.

1. Cranial deformation: The frequency was found to be more among the artificially deformed skulls [6].
2. Adaptation to cranial enlargement: According to Jeanty et al., the number of wormian bones increases with the capacity of the skull, regardless of the cause of enlargement [7].
3. Genetic factors: According to Barberini et al., their formation might be under the control of a number of genes and their phenotypic expression is conditioned by developmental thresholds [8].

MATERIALS AND METHODS

Present study carried out with 50 nos adult skulls from Tagore Medical College, among these 25 skulls (Fig. 1) from males and 25 from females (Fig. 2).

Fig. 1: Showing 25 male skulls.



Fig. 2: Showing 25 female skulls.



All the skulls were carefully analyzed for the sutural bones in all the four regions and were noted carefully and tabulated (Table-1). Based on the statistical analysis was done for the female and male skulls. The results were tabulated and compared with occurrence of wormian bones among Indian population.

Table 1: Showing the occurrence of sutural bones in different points between male and female skull.

POINTS ON SKULL	IN MALE	IN FEMALE
BREGMA	0	0
LAMBDA	13	1
PTERION	8	7
ASTERION	35	19
TOTAL	56	27

RESULTS AND DISCUSSION

By this present study we proved that sutural bones are more among the male skulls belongs the Tamil Nadu than in female which is exactly the opposite of the results belongs to Indian skulls with more wormion bones in females.

Bregma: As like skulls of other population no sutural bones were found in our study in the bregma region of both in male and female skulls (Fig-3).

Fig. 3: Showing bregma region without sutural bones.



Lambda: Male skulls shown more sutural bones-13, than the female-1, skulls in this region (Fig. 4).

Fig. 4: Showing lambda with sutural bone.



Pterion: Both male-8, and female-7, skulls had more or less equal number of wormian bones in this point (Fig. 5).

Fig. 5: Showing pterion with sutural bones.



Asterion: This point showed the highest number of wormian bones both in male-35, and female-19 skulls of Tamil Nadu. But when compared within them male skulls showed more sutural bones than female skulls (Fig. 6).

Fig. 6: Asterion with sutural bones.



Totally a sum of 56 sutural bones in males and 27 sutural bones in females were found among 50 adult Tamil Nadu skulls. Generally male skulls were having more wormian bones than the female skulls among Tamil Nadu skulls present in Tagore Medical College. The incidence

of Wormian bones has varied with the bias of the reporting authors. Najjar suggested that the incidence is lower in fetuses (11.3%) than in adults (62.1% - 76.2%) [9]. Incidence of Wormian bones in humans vary from 8% to 15% in a random population and reaches 54% in a mentally impaired population [10]. Studies among the Indian population have shown more sutural bones among female skulls [4]. Our present study revealed more number of wormian bones in male skulls among Tamil Nadu population (Table-1).

CONCLUSION

Along the course of life or during some medical emergencies we are in need to take the radiographs for analysis. During that period the x ray may show some extra bones in the skull other than the normal bones. There are possibilities for the clinicians to misinterpret it as a fracture rather than sutural bones [11]. Study of the wormian bones and their occurrence in different points and between male and female put some light on the radiographs to give a good interpretation in times of need.

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Conflicts of Interests: None

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