INTRODUCTION

Frontal bone is a pneumatic single flat bone of the calvaria. It has a two parts, squamous part involved in the formation of forehead whereas orbital part forming the roof of the orbit (1). The median suture between the two halves of frontal bone usually closes in the first postnatal year but may persist as the metopic suture in some individuals and various ethnic groups (2). It is located anterior to the coronal suture.

It develops by the union of two halves of frontal bone. Each half of frontal bone ossifies from one primary centre in the membrane at the frontal part of the cranium. It is otherwise known as median frontal suture. The metopic suture normally closes at the age of 8 years sometime even after 8 years it persists due to non-union of two half of frontal bones. The incidence of metopism varies with race. Hence the present study was undertaken.

Aim of the Study: To find out the incidence of metopism in South Indian population.

MATERIALS AND METHODS

70 dry adult skulls were observed for the presence of metopic suture. Metopic suture were classified into complete metopic suture (metopism) and incomplete metopic suture type.

Results: In the present study the incidence of metopism was 5.71% in South Indian population.

Conclusion: The knowledge of metopic suture is significant for radiologist (which is usually mistaken as cranial fracture), neurosurgeon, forensic medicine and anthropologist.

Key Words: Suture; Metopism; Frontal bone; Nasion; Bregma

SUMMARY

Introduction: Metopic suture is a dentate type of suture extending from the nasion to the bregma of the skull bone. It is otherwise known as median frontal suture. Metopic suture normally closes at the age of 8 years sometimes even after 8 years it persists due to non-union of two half of frontal bones. The incidence of metopism varies with race. Hence the present study was undertaken.

Aim of the Study: To find out the incidence of metopism in South Indian population.

Materials and Methods: 70 dry adult skulls were observed for the presence of metopic suture. Metopic suture were classified into complete metopic suture (metopism) and incomplete metopic suture type.

Results: In the present study the incidence of metopism was 5.71% in South Indian population.

Conclusion: The knowledge of metopic suture is significant for radiologist (which is usually mistaken as cranial fracture), neurosurgeon, forensic medicine and anthropologist.

Key Words: Suture; Metopism; Frontal bone; Nasion; Bregma

INTRODUCTION

Frontal bone is a pneumatic single flat bone of the calvaria. It has a two parts, squamous part involved in the formation of forehead whereas orbital part forming the roof of the orbit (1). The median suture between the two halves of frontal bone usually closes in the first postnatal year but may persist as the metopic suture in some individuals and various ethnic groups (2). It is located anterior to the coronal suture.

It develops by the union of two halves of frontal bone. Each half of frontal bone ossifies from one primary centre in the membrane at the frontal part of the cranium. It is otherwise known as median frontal suture. The metopic suture normally closes at the age of 8 years sometime even after 8 years it persists due to non-union of two half of frontal bones. The incidence of metopism varies with race. Hence the present study was undertaken.

Aim of the Study: To find out the incidence of metopism in South Indian population.

MATERIALS AND METHODS

70 dry adult cadaveric skulls of unknown sex were collected from the Department of Anatomy, Subbaiah Institute of Medical Sciences and Govt Vellore Medical College. The non-mutilated complete adult skull examined for metopic suture. The metopic suture classification followed by Agarwal et al., (7) Ajmani et al., (11) and Castilho et al., (12) were applied. The classification is as follows

Complete metopic suture: Metopic suture extending from bregma to nasion.

Incomplete metopic suture: Extends for a short distance either from the nasion or from bregma.

Further incomplete metopic suture is subclassified, depending upon site from where metopic suture arises either into Nasion incomplete type of metopic suture and Bregma incomplete type of metopic suture.

Based on the shape, Nasion incomplete metopic suture type is described as linear type, V-shape and U-shape.

OBSERVATIONS AND RESULTS

In the present study out of 70 dry adult calvarial skulls 4 skulls (5.71%) showed complete metopism. The nasion type of metopic suture was seen in 22 skulls (31.4%) whereas bregma type of metopic suture was not observed. Out of the 22 nasion type of incomplete metopic sutures, 15 linear types, 5 U-shaped and 2 V-shape were noted. The observation of metopic suture were shown in Figure 1 and tabulated in Table 1. The incidence of complete metopism in my study and other studies were tabulated in Table 2.

DISCUSSION

In our study out of 70 skulls incidence of complete metopic suture were 5.71% the values were similar to other studies tabulated in Table 2 of 70 skulls incidence of bregma type incomplete metopic suture were zero but the incidence of nasion type incomplete metopic suture were 31.40%. Incidence reports of present study were similar to report of other Indian authors which were tabulated in Table 3 for comparison purpose. The incidence of metopic suture varies from 1-10%.

The sutures of the skull ensure its proper shape during development. Premature ossification results in abnormal growth and shape of the skull e.g. “tower skull” (midface hypoplasia and ocular proptosis) scaphocephaly (also known as dolichocephaly) is the most common form of craniosynostosis (13-
TABLE 1:
Incidence of complete and incomplete metopic sutures

<table>
<thead>
<tr>
<th>Type of suture</th>
<th>Number(70)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>4</td>
<td>5.71</td>
</tr>
<tr>
<td>Incomplete</td>
<td>22</td>
<td>31.40</td>
</tr>
<tr>
<td>Linear type</td>
<td>15</td>
<td>21.42</td>
</tr>
<tr>
<td>U shape</td>
<td>5</td>
<td>7.14</td>
</tr>
<tr>
<td>V shape</td>
<td>2</td>
<td>2.80</td>
</tr>
</tbody>
</table>

TABLE 2:
Incidence of metopism in different races-comparison

<table>
<thead>
<tr>
<th>Author</th>
<th>Incidence (%)</th>
<th>Population/race</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agarwal(11)</td>
<td>2.66%</td>
<td>Indians</td>
</tr>
<tr>
<td>Ajmani(10)</td>
<td>3.4%</td>
<td>Nigerians</td>
</tr>
<tr>
<td>Dus(13)</td>
<td>3.31%</td>
<td>Indians (UP)</td>
</tr>
<tr>
<td>Breathnach(9)</td>
<td>7-10%</td>
<td>European</td>
</tr>
<tr>
<td>Breathnach(9)</td>
<td>4—5%</td>
<td>Yellow races</td>
</tr>
<tr>
<td>Breathnach(9)</td>
<td>1%</td>
<td>African population</td>
</tr>
<tr>
<td>Hussain Saheb(14)</td>
<td>3.2%</td>
<td>Indians (South India)</td>
</tr>
<tr>
<td>Shanta Chandrasekaran(15)</td>
<td>5%</td>
<td>Indians (South India)</td>
</tr>
<tr>
<td>William F Masih(16)</td>
<td>6.5%(in all age groups)</td>
<td>Indians (Western Rajasthan)</td>
</tr>
<tr>
<td>Manjunath Halagatti etal(17)</td>
<td>6.02%</td>
<td>Indians (Karnataka)</td>
</tr>
<tr>
<td>Present study</td>
<td>5.71%</td>
<td>Indians</td>
</tr>
</tbody>
</table>

Figure 1) Showing types of Metopic Suture
Morphology of metopic suture and its clinical significance in human adult skull

18). It is often associated with agenesis or hypoplasia of frontal sinus (19,20). Many researchers are of the opinion metopism has genetic influence (12). Consideration should be given at the level of molecular biology.

CONCLUSION
The knowledge about metopic suture is essential for the neurosurgeons, radiologists and anthropologists. The present study provides the data about incidence of metopic suture in South Indian population which helps the radiologist to differentiate between vertical frontal bone fracture and metopic suture and neurosurgeons to treat a head injury patient and during frontal craniotomy procedure. Further study should be carried at molecular level by embryologist to know the etiology for metopism.

REFERENCES