

To study the chronology and pattern of union of cranial sutures namely Basisphenoid-Basiocciput, Coronal, Sagittal and Lambdoid.

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Abstract

Background & Methods: The aim of the study is to study the chronology and pattern of union of cranial sutures namely Basisphenoid-Basiocciput, Coronal, Sagittal and Lambdoid. In our study, out of total 150 subjects, 86 males and 64 females were taken. The age of victims varied from 15 to 65 years.

Results: In age group 15-20 years, total 15 cases were taken. Majority of female cases were in grade 3 (3 cases) followed by grade 4 (2 case). Among males in this age group, majority were in grade 2 (4 cases), followed by grade 4 (3 cases). Among 21-25 years age group, only 1 case was found in grade 3. Rest of all other age groups were showing complete closure (grade 4) of basi-sphenoid and basi-occiput suture.

Conclusion: Though there is some difference in suture closure in males and females, females show earlier union than males in basi-sphenoid and basi-occiput sutures which is between 15-25 years of age but in other sutures, suture closure occurred earlier in males than in females.

Basi-sphenoid and Basi-occiput sutures – in our study, out of total 150 subjects, 86 males and 64 females were taken, all males above 23 years of age showed complete fusion of basi-sphenoid and basi-occiput sutures i.e. Grade (complete closure of sutures without any suture line visibility) was present, while in the female, the complete closure i.e grade 4 was present in 20 years of age.

Keywords: chronology, cranial, sutures, basisphenoid-basiocciput, sagittal and lambdoid.

Study Design: A descriptive cross-sectional study.

Introduction

Scientific estimation of age of an individual whether living, dead or human remains is a vexing problem for Medical Jurist in both civil and criminal matters. Cases for age estimation are being referred to Forensic expert for their opinion[1]. Age estimation of living is most

important issue to the court and to common citizen as well. Community relies on Forensic expert for justice. Age estimation help in both civil and criminal cases such as consent, juvenile offenders, kidnapping, rape, marriage, attainment of majority, employment, impotence, sterility, competency as a witness, identification, senior citizen concession, retirement benefits, in old pension cases & in the question of fitness or unfitness[2]. If proper age is not given, it is injustice to the patient and profession.

It may not be difficult to determine the age of the person, with good degree of accuracy from birth up to an age group of 25 years[3]. The determination of age is needed for employment, marriage, majority, management of property, voting right, competency as witness and testamentary capacity. The significance of determination of the age is most important in the criminal cases, such as rape, infanticide, kidnapping, prostitution, juvenile delinquency and criminal responsibility[4-5].

Reasonably correct estimation of age in elderly people is essential in legal, medical, social and administrative matters, like fixing of age for regularization of employment, superannuation, pension settlements, senior citizen benefits, old age and good behaviour of the prisoner[6].

Material and Methods

This study is conducted on the cases referred for investigation in various pathological abnormalities from various departments in SAMC & PG institute, Indore for CT scan. Cases with complaints & diseases like headache, brain tumours, traumatic injuries, epilepsy, cerebrovascular accidents, various haemorrhages, encephalitis, meningitis etc. are referred to Department of Radio-diagnosis for investigation. 150 cases between age 15-65 were studied. Documentary proof of age was collected. After the C.T. scan of head, basi-sphenoid and basi-occiput.

Inclusion criteria:

1. The cases of known age coming for CT scan examination. Age was confirmed by documentary evidences like birth certificate, identification cards, ration card, 10th, 12th marksheet, voter id .etc.
2. Subjects between 15-65 years of age were taken.

Exclusion criteria:

1. Unknown age where exact age cannot be confirmed.
2. Individuals of unknown age or those who had suffered significant head trauma, which has potentially affected the area of interest, were excluded from the sample.

Result**Table No. 1: Gender Wise Distribution of Cases**

Sex	Number Of Cases	Percentage
Males	86	57.3%
Females	64	42.7%
Total	150	100%

In our study, out of total 150 subjects, 86 males and 64 females were taken. The age of victims varied from 15 to 65 years. Age groups were classified in 5 year intervals. In each group, 15 cases were taken for the study. Number of males and females in each group were different.

Table No. 2: BASI –SPHENOID AND BASI OCCIPUT SUTURE

Age group	Males	Females	Total	Suture Grade-0		Suture Grade-1		Suture Grade-2		Suture Grade-3		Suture Grade-4	
				M	F	M	F	M	F	M	F	M	F
15-20	10	5	15	1	0	1	0	4	0	1	3	3	2
21-25	11	4	15	0	0	0	0	0	0	1	0	10	4
26-30	7	8	15	0	0	0	0	0	0	0	0	7	8
31-35	8	7	15	0	0	0	0	0	0	0	0	8	7
36-40	9	6	15	0	0	0	0	0	0	0	0	9	6
41-45	9	6	15	0	0	0	0	0	0	0	0	9	6
46-50	7	8	15	0	0	0	0	0	0	0	0	7	8
51-55	8	7	15	0	0	0	0	0	0	0	0	8	7
56-60	8	7	15	0	0	0	0	0	0	0	0	8	7
61-65	11	4	15	0	0	0	0	0	0	0	0	11	4
Total	86	64	150	1	0	1	0	4	0	2	4	79	59

In age group 15-20 years, total 15 cases were taken. Majority of female cases were in grade 3 (3 cases) followed by grade 4 (2 case). Among males in this age group, majority were in grade 2 (4 cases), followed by grade 4 (3 cases). Among 21-25 years age group, only 1 case was found in grade 3. Rest of all other age groups were showing complete closure (grade 4) of basi-sphenoid and basi-occiput suture.

Discussion

The determination of age of an individual has been a problem since long. Controversies exist time to time, especially in medico-legal work regarding the determination of age of a person. Age becomes important in cases of criminal responsibility, marriage, rape, personal identity etc[7]. In the past, several illogical criteria have been used for assessing the age so much so

that a medical man used to be in equal footing with the laymen on the point of determination of age. Many times wrong assessment of age has resulted in difficulties for imparting justice.

In later years of life all the teeth have erupted and practically all the epiphyses have united with the diaphysis while the height and weight are of not much significance to determine the post adulthood age[8].

Gustafson has done the work in which he has given the idea to determine the age on the basis of changes that occur in teeth. Literature is full of certain changes such as lipping of the bones, graying of the hair, appearance of arcus senilis in the cornea, opacity in lens, atherosclerotic changes in the arteries, wrinkling of the skin especially of the face. They are too vague to be considered for determination of age in Medico-legal work.

Obliteration of skull sutures in late age, practically becomes useful when all the teeth have erupted and epiphysis have fused i.e. after 21 yrs of age and gives fairly accurate idea but here also we find that the determination of age can only be in decades, based on sole criterion of suture obliteration.

When basisphenoid and basiocciput suture is evaluated, it is found that the earliest closure is seen in males and females of 15 -20 yrs of age (3&2 cases respectively), but majority of closure were seen in age group 21-25 yrs and after 26 yrs of age, all sutures were completely closed.

The p value is calculated for gender difference and it is found to be 0.533, which is not significant.

Findings closely related with study mentioned in Textbook of Vij[7], Karmakar[8], Vishwas[9], Rao[10] and Bardale[11-14].

Conclusion

Though there is some difference in suture closure in males and females, females show earlier union than males in basi-sphenoid and basi-occiput sutures which is between 15-25 years of age but in other sutures, suture closure occurred earlier in males than in females.

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