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Research Article

Determination of Age 18 Years by Radiological (X Ray) examination in Boys of Sangli

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Abstract

The present study is carried out in Sangli, Maharashtra in India who visited hospital either as a patient or accompanied the patients. The consent of the Parents and the individual was obtained after explaining them the objectives of the study. X ray were obtained he method of classification was categorizes in 5 stages based on the standard protocol prescribed. The union of head of Humerus with the shaft occurs between 18 to 19.5 years. The fusion of lower end of Ulna with shaft is complete by 18 to 19 years. The fusion of lower end of Radius has occurred 19 to 19.5 years. Where as lower end of Ulna 0.5 year earlier than the lower end of Radius in same individuals. Complete union of epiphysis of acromion of scapula occurs by 18 to 18.5 Years.

Keywords: Age estimation, Radiology.

Introduction

The problem of determination of age of an individual particularly in the growing period of life is of considerable importance¹ in Forensic Medicine and comes up frequently in connection with the questions of criminal responsibility, cases of kidnapping, rape, validity of marriage contract, eligibility for employment, attainment of major,

Judicial punishment, identification, etc.,² Estimation of age is even more important in murder cases, when attempts have already been made to dispose of the body by dismemberment, by mutilation, by the use of corrosive to the action of fire, or when only skeletal remains are available.³

Materials and Method

Fifty subjects from Sangli, who visited hospital for various reasons other than Neurological and Ortho problem, were explained about the study. And after the consent they were included in the study based on inclusion and exclusion criteria.

These subjects belonged to different economical, social and educational status and various religious groups. One of the important criteria insisted upon during selection of the subjects, was availability of authenticated birth records.

These subjects were divided into six age groups as

1. 17- 17.5 years
2. 17.5 – 18 years
3. 18-18.5 years
4. 18.5-19 years
5. 19- 19.5 years
6. 19.5- 20 years.

All the subjects were subjected for X ray examination of Shoulder and Wrist Joint.

The method of classification of fusion used for epiphysis of long bones.

Satge 1;- in this stage, there is no union or surface adaption between the epiphysis and diaphysis. Here the epiphysis does not cap the diaphysial end.

Shate 2;- in this stage, there are no changes in the diaphysico-epiphyseal space. There is no indication of any union starting between the former completely caps the latter so that the uniting ends have adopted themselves to each other.

Stage 3;- this stage denotes the beginning of the union. Here the obliteration of the diaphysico-epiphyseal space hs started. The space is traversed by wavy lines, the appearance of which gives an indication of beginning union.

Stage 4;- in this stage recent union is represented. Here the diaphysio epiphyseal space is obliterated, but at the periphery of the space some notching still persists both in antero- posterior and lateral view.

Stage 5;- here there is a complete union between the epiphysis and diaphysis. The diaphysion epiphysial union is complete. There is notching for epiphyseal scar and there is uninterrupted continuity of periosteum between the epiphysis and diaphysis.

Satge 6;- in this stage there is complete union between the epiphysis and diaphysis. But at the site of diaphysio-epiphyseal space of white line persists. This is called epiphyseal scar.

Table showing union of proximal epiphysis of head of Humerus with shaft in males

S.No	Age Group (Years)	No. Of Subjects	Different stages of radiological epiphysial union					
			1	2	3	4	5	6
1	17-17.5	8	-	-	8	-	-	-
2	17.5-18	7	-	-	-	7	-	-
3	18-18.5	8	-	-	2	5	1	-
4	18.5-19	10	-	-	6	-	3	1
5	19-19.5	7	-	-	-	-	7	-
6	19.5-20	10	-	-	-	-	9	1

Table showing union of distal epiphysis of Ulna with the shaft

S.No	Age Group (Years)	No. Of Subjects	Different stages of radiological epiphysial union					
			1	2	3	4	5	6
1	17-17.5	8	-	-	7	-	1	-
2	17.5-18	7	-	-	-	2	5	-
3	18-18.5	8	-	-	-	-	4	2
4	18.5-19	10	-	-	-	-	10	-
5	19-19.5	7	-	-	-	-	7	-
6	19.5-20	10	-	-	-	-	10	-

Table showing epiphysis of acromion of Scapula in males.

S.No	Age Group (Years)	No. Of Subjects	Different stages of radiological epiphysial union					
			1	2	3	4	5	6
1	17-17.5	8	-	-	3	2	-	3
2	17.5-18	7	-	-	5	-	2	-
3	18-18.5	8	-	-	-	-	8	-
4	18.5-19	10	-	-	-	-	8	-
5	19-19.5	7	-	-	-	-	-	7
6	19.5-20	10	-	-	-	-	-	10

Discussion

Radiological fusion of epiphysis of the head of humerus, lower end of ulna and radius was observed in all the subjects. Acromion of Scapula also compared with other studies.

Head of Humerus

Galstuan working on Bengalees⁴ observed that the head of humerus fused with shaft, between 14-18 years. Fleckers⁵ working on Australian observed that the fusion occurs by about 19 years. In the present study we observed the earliest fusion in males age group 18- 18.5 years. The crescent was seen in age group of 19.5- 20 which is an indication of complete fusion. From this data the fusion of head

of humerus with shaft occurs at the age of 19 years.⁶ A significant observation made in this study was no single case showed fusion before 17.5 years.

Lower end of Ulna

Galstuan working in Bengalees⁴ observed that epiphysis of the lower end of ulna fuses with shaft at about 18 years in males. Flecker and Davies and parson observed 19 years for males. In the present study, it was observed that in the I.⁷ Age group only one subject. The majority of the fusion was seen in age group II and III and 100% fusion was seen in age group IV. With this above data one can be suggested that fusion occurs at the age of 18.5 years

Lower end of Radius.

Lall and Nat observed that in males of Uttar Pradesh, union occurred in 40% of the cases between 16-17 years, in 73% of cases in the age group of 18-19 years.⁸ The corresponding figures of Loomba were zero percent, for 16-17 years and 42% for 18-19 years. In present study majority of fusion in males was seen in IV age group and 100% fusion was seen in age group V.

Comparison of results of Ulna and Radius.

It was observed by that in all subjects the union of lower end of Ulna was little earlier than lower end of Radius, even though the range of fusion was same in both epiphyses.⁹ The present study also confirms the same.

Galstuan working of Bengalees⁴ observed that the fusion of Acromion occurred 13-16 years in males. The work of Pillai⁹ on Tamilians shows fusion of acromion occurred at the age of 18 years. Flecker observed that fusion occurs in 17 years in males.^{10,11,12} The present study series the fusion is seen 17-18.5 years.

Conclusion

The union of head of Humerus with the shaft occurs between 18 to 19.5 years. The fusion of lower end of Ulna with shaft is complete by 18 to 19 years. The fusion of lower end of Radius has occurred 19 to 19.5 years. Where as lower end of Ulna 0.5 year earlier than the lower end of Radius in same individuals. Complete union of epiphysis of acromion of scapula occurs by 18 to 18.5 Years.

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