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AN ANALYTICAL STUDY OF CALCIFICATION OF TRIRADIATE CARTILAGE OF PELVIS FOR AGE ESTIMATION USING X-RAYS

Radiology

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ABSTRACT

Age estimation in India is done for many criminal proceedings and for some noncriminal cases.In this Study, triradiate cartilage calcification is analyzed in 249 patients. Triradiate cartilage calcification of pelvis is one of the tools for age assessment in cases of under 18 years of age.This is a retrospective analytical study of two years duration from January 2014 to December 2016 done in the department of radiodiagnosis, tirunelveli medical college hospital. 249 cases were taken for analytic study. On comparison, 73% of females show calcification in 13-14 years of age which is significantly higher than the same age group males. this shows earlier calcification in females. Complete calcification of triradiate cartilage occurs in 15 years in both males and females.

KEYWORDS:

Epiphysis, ossification, assessment

INTRODUCTION

Age estimation in india is done for many criminal proceedings and for some noncriminal cases.

Epiphyseal appearances and fusion help to assess the age of the individual.in this regard, xrays play important role for showing bones.in this study, triradiate cartilage calcification is analysed in 249 patients. Triradiate cartilage calcification of pelvis is one of the tools for age assessment in cases of under 18 years of age.

METHODS

This is a retrospective analytical study of two years duration from January 2014 to December 2016.the study was carried in the department of radiodiagnosis, tirunelveli medical college hospital. In our institute,3102 pelvis xrays were taken during above period in all age groups. In which patients of age 11-18 were 302. After excluding some cases as per exclusion criteria,the remaining 249 cases were taken for analytic study i.e sample selection. So number of patients selected for study is 249.

INCLUSION CRITERIA

xrays of patients of age 11-18 without growth retardation

EXCLUSION CRITERIA

1-patients with growth retardation of any etiology
2- xrays with fractures

RESULTS

in this study,119 xrays of girls and 130 xrays of boys are analysed .the results are analysed as follows(table-1 and 2)

table 1-gender wise distribution

s.no	Age in years	females	males	total
1	11-12	16	18	34
2	12-13	18	20	38
3	13-14	19	22	41
4	14-15	21	24	45
5	15-16	16	17	33
6	16-17	15	16	31
7	17-18	14	13	27
	total	119	130	249

table 2- calcification of triradiate cartilage in girls and boys

s. no	Age in years	females			males		
		Number of cases	calcification	percentage	Number of cases	calcification	percentage
1	11-12	16	0	0	18	0	0
2	12-13	18	6	33.33	20	8	40
3	13-14	19	14	73.68	22	12	54.54
4	14-15	21	19	90.47	24	20	83.33
5	15-16	16	16	100	17	17	100
6	16-17	15	15	100	16	16	100
7	17-18	14	14	100	13	13	100
	Total cases	119			130		

Chart 1- female cases calcification

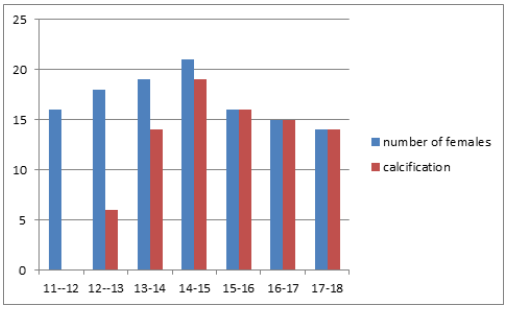
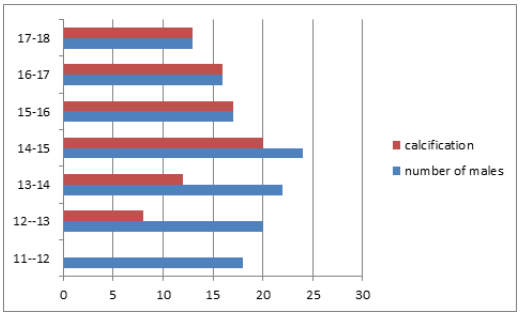


Chart 2-male cases calcification



Complete calcification of triradiate cartilage in females is found in about 33% in 12-13 years,73% in 13-14 years,90% in 14-15 years. Above 15 years in females, all xrays showed complete calcification (chart 1).

In males, total calcification is seen in 40% of cases in 12-13 years, 54% in 13-14 years, 83% in 14-15 years and 100% in cases above 15 years (chart 2).

On comparison, 73% of females show calcification in 13-14 years of age which is significantly higher than the same age group males. this shows earlier calcification in females.



Figure 1;male 12-13 years - no calcification of triradiate cartilage



Figure 2; male 13-14 years- no calcification of triradiate cartilage

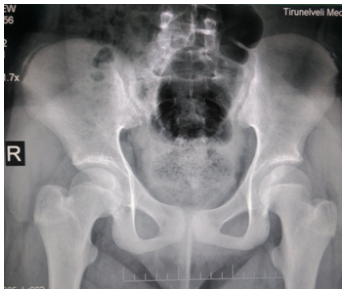


Fig3; female 15-16years- complete calcification of triradiate cartilage



Figure4; male 15-16years-complete calcification of triradiate cartilage

DISCUSSION

In the study by H.Flecker, At 13 years of age ,50 % of females show fusion(1). It is already documented that variability in the morphological features which are used to assess age progressively increases from birth to old age in humans(2). There is a sharp increase in the demand for forensic age estimates of live persons in many countries in recent years(3). Females ahead of males by 1–2 years is the study result by Cardoso, H. F.V. in 2008(4). Developing and use of nonionising imaging modalities is desirable for age estimation in living individuals to reduce radiation exposure.(5)

CONCLUSION

Complete calcification of triradiate cartilage occurs in 15 years in both males and females. In 13-14 age group,females show significant higher percentage of calcification than males indicating earlier calcification in females.

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