Original Research Article

Age of Criminal Responsibility and Pisiform Bone

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Abstract

introduction: Age of criminal responsibility is of importance in criminal cases such as physical and sexual assault, kidnapping, etc. Under Indian laws ages related to criminal responsibility are 5, 7, 12 and 18 years. Under 82 IPC nothing is an offence which is done by a child below 7 years of age.**Objectives:** To establish correlation between age of appearance of pisiform bone and age of criminal responsibility in children of Purvanchal Region.**Material and Methods:** The present cross-sectional study was conducted at the Department of Forensic Medicine in collaboration with the Department of Radiodiagnosis, Government Medical College and Super Facility Hospital, Azamgarh. The study population consisted of children from 0 to15 years coming to Paediatrics OPD of Government Medical College and Super Facility Hospital, Azamgarh from October 2018 to April 2019.**Results:**In this study the mean age of appearance of pisiform bone is 124.84±23.04 months. The youngest subject showing the appearance of pisiform bone is 7 years and 8 months old female. The oldest subject showing non appearance of pisiform bone is 12 years and 1 month old male.**Conclusion:**The appearance of pisiform bone in X-ray hand and wrist joint is a good indicator of 7 years and 12 years of age that are related to criminal responsibility.

Keywords: Criminal responsibility, pisiform , radiology, ossification, punishment, Purvanchal Region.

Introduction

Age of criminal responsibility is of importance in criminal cases such as physical and sexual assault, kidnapping, etc. Under Indian laws ages related to criminal responsibility are 5, 7, 12 and 18 years. Under 82 IPC nothing is an offence which is done by a child below 7 years of age. However, this presumption is applicable only to the offences prescribed under IPC 1860, and does not extend to local and special acts[1].Under Indian Railways Act 1890 this age is below 5 years.Proof of age is required for form and quantum of punishment. Due to non- availability or poorly maintained or deliberately manipulated records, reliance cannot be done on the presented age document[2]. Courts usually refer cases of disputed age for medical opinion before finalizing verdicts. Medicolegal examination for age estimation is done under headings general physical examination, examination of secondary sexual characters, dental examination and radiological examination. Out of these, radiological examination of joints and ends of long bones has shown accuracy and reliability acceptable to medical profession and legal system[3].In children wrist joint and elbow joint are most suitable joints to be X- rayed for age estimation.

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Many authors have published the data of the population of their particular region[4]. These data cannot be relied upon for our population as racial, socioeconomic and geographical factors play important role in growth and development of bones[5].

Objectives

To establish correlation between age of appearance of pisiform bone and age of criminal responsibility in children of Purvanchal Region.

Material and Methods

The present cross-sectional study was conducted at the Department of Forensic Medicine in collaboration with the Department of Radiodaignosis, Government Medical College and Super Facility Hospital, Azamgarh. The study population consisted of children from 0 to15 years coming to Paediatrics OPD of Government Medical College and Super Facility Hospital, Azamgarh from October 2018 to April 2019. Only individuals with known date of birth and apparently healthy individuals were included in the study. Individuals with any chronic illness, short stature, deformity, severe malnutrition- weight age less than 60%, endocrine disorders, malformations and chronic drug intake- antiepileptic, steroid etc were excluded from the study. The study comprised of a total 289 subjects in age group 0 to 15 years. The sample was divided into 14 groups each of 12 months interval. (Table1)

Table 1: Age distribution of patients studied

Age in months	No. of Patients	%
1-12 months	36	12.4
13-24 months	39	13.4
25-36 months	20	6.9
37-48 months	24	8.3
49-60 months	22	7.6
61-72 months	28	9.6
73-84 months	10	3.4
85-96 months	18	6.2
97-108 months	11	3.8
109-120 months	13	4.4
121-132 months	8	2.7
133-144 months	18	6.2
145-156 months	21	7.2
>156 months	21	7.2
Total	289	100.0

X-ray of left hand in AP View was taken. The information regarding particulars of the subjects and findings were recorded in a specially designed proforma and analyzed.

Statistical software: The statistical software namely SPSS 22.0 and R environment ver.3.2.2 were used for analysis of data and Microsoft word and Excel have been used to generate tables. Student t test has been applied for p value. Kaplan Meier Function was applied to calculate 95% Confidence Interval (CI).

Results and Discussion

The study has been conducted on 289 healthy individuals aged from 0 to 15 years of which 167 (57.7 %) were males and 122(42.2%) were females. (Table2)

Table 2: Gender distribution of patients studied

Gender	No. of Patients	%
Female	122	42.2
Male	167	57.7
Total	289	100.0

Table 3, 4 & 5 show ossification of pisiform bone in different age groups in males and females combined, males and females respectively.

Table 3: Percentage of Individuals Showing Ossification of Pisiform Bone in Different Age Groups (Males and Females)

Age in months	Males and Females	Total=289
1-6 M	0(0%)	17
7-12 M	0(0%)	19
13-24 M	0(0%)	39
25-36 M	0(0%)	20
37-48 M	0(0%)	24
49-60 M	0(0%)	22
61-72M	0(0%)	28
73-84 M	0(0%)	10
85-96 M	2(11.1%)	18
97-108 M	3(27.3%)	11
109-120 M	2(15.4%)	13
121-132 M	4(50%)	8
133-144 M	11(61.1%)	18
145-156 M	20(95.2%)	21
156 & above	21(100%)	21

Table 4:Percentage of Individuals Showing Ossification of Pisiform Bone in Different Age Groups (Males)

Age in months	Males	Total=167
0-12 M	0(0%)	25
13-24 M	0(0%)	23
25-36 M	0(0%)	11
37-48 M	0(0%)	11
49-60 M	0(0%)	12
61-72M	0(0%)	14
73-84 M	0(0%)	6
85-96 M	0(0%)	13
97-108 M	0(0%)	4
109-120 M	1(10%)	10
121-132 M	2(33.3%)	6
133-144 M	6(50%)	12
145-156 M	10(90.9%)	11
156 & above	9(100%)	9

Table 5: Percentage of Individuals Showing Ossification of Pisiform Bone in Different Age Groups (Females)

Age in months	Females	Total=122
0-12 M	0(0%)	11
13-24 M	0(0%)	16
25-36 M	0(0%)	9
37-48 M	0(0%)	13
49-60 M	0(0%)	10
61-72M	0(0%)	14
73-84 M	0(0%)	4
85-96 M	2(40%)	5
97-108 M	3(42.9%)	7
109-120 M	1(33.3%)	3
121-132 M	2(100%)	2
133-144 M	5(83.3%)	6
145-156 M	10(100%)	10
156 & above	12(100%)	12

Table 6 shows mean age and standard deviation of age of ossification of pisiform bone in male, females and combined. It also shows 95% Confidence Interval (CI) using Kaplan Meier Function.

Table 6: Comparison of mean age according to gender of population studied

Carpal bone	Mean Age in Months (Ossification appeared)			P value	Kaplan Meier function	
	Male	Female	Total		Mean Age(months)	95% CI
Pisiform	123.80±22.64	126.78±23.98	124.84±23.04	0.563	124.96	120.12-129.73

In this study the mean age of appearance of pisiform bone is 124.84±23.04 months which is in accordance with Paterson (1929)[6]and Flecker (1942)[7] The age of appearance of pisiform bone is reported to be slightly higher in Gaulstan (1937)[8]and Hasan and Narayan (1963)[9] studies. SS Bhise (2011)[10] reported that it appeared in females by 10-12 years and in males 12-13years in the population of Mumbai. PA Wankhade (2013)[11] observed in Wadha region that pisiform bone in males appeared in 11-15 years. This is not consistent with our study. Nizamuddin (2012)[12] observed that pisiform appeared at 12 years in both males and females. In present study total 289 subjects were studied out of which no case showed appearance of pisiform bone before 7 years. This finding is of considerable importance as 7 years of age is related to Sec.82& 83 IPC. So we can say that a child in whom pisiform bone is present must be above 7 years of age and mature enough to be tried under Sec. 83 IPC for criminal responsibility.We observed that 50% subjects showed pisiform bone by 12 years and 95.2% by 13 years. After 13 years 100% subjects showed ossification of pisiform bone in X-ray hand and wrist joint.The youngest subject showing the appearance of pisiform bone is 7 years and 8 months old female (Fig 1). The oldest subject showing non appearance of pisiform bone is 12 years and 1 month old male (Fig 2). So we can presume that a child with no visible pisiform bone in his or her X-ray hand cannot be above 12 years of age, so his or her criminal responsibility will be decided according to Sec.83 IPC, if he or she is above 7 years of age.

Fig 1: X-ray hand and wrist joint AP view of a 7 years and 8 months old female showing ossification of capitate, hamate, triquetral, lunate, schaphoid, trapezium, trapezoid, pisiform, lower end of radius and lower end of ulna

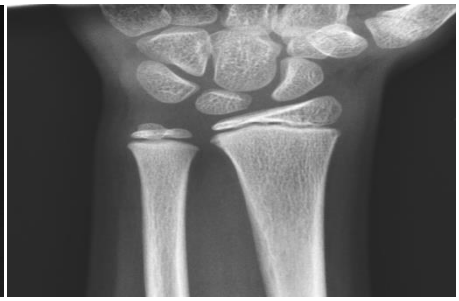

Fig 2: X-ray hand and wrist AP view of a 12 years 1 month old male showing capitate, hamate, triquetral, lunate, schaphoid, trapezium, trapezoid, lower end of radius and lower end of ulna. Pisiform is absent

Conclusion

The appearance of pisiform bone in X-ray hand and wrist joint is a good indicator of 7 years and 12 years of age that are related to criminal responsibility. We conclude that if pisiform bone is present in X-ray hand and wrist AP view it indicates that child is above 7 years of age and criminal responsibility will be decided according to Sec.83 IPC.

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