Estimation of Age through Elbow Joint in children of Karnataka

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Abstract

70(35 male and 35 females) children aged between 11 to 18 years were studied for ossification of elbow joint radiologically, 4(11.4%) were 11 years 5(14.2%) were 12 years, 7 (20%) were 13 years of age, 5(14.2%) were 14 years, 3(8.57%) were 15 years were 16 years, 3 (8.57%) were 17 years and 4 (11.4%) were 18 years old. The radiological study of elbow joint was Appearance of trochlea was observed only in female at 11 year. Fusion of trochlea was in males at 14 to 15 years of age and in 12 to 14 years in females. Appearance of lateral Epicondyle in male was 11 to 12 years but in females at 11 years only. Fusion of lat epicondyle in males was between 13 to 16 years and in females 13 to 14 years. Fusion of medial epicondyle in males was between 14 to 16 years but in females between 11 to 15 years. Fusion of head of Radius in males between 14 to 16 years of age but in females between 11 to 13 years only. Appearance of olecranon process in males between 11 to 13 years and in females between at 11 years only. Fusion of olecranon process in males was between 17 to 18 years of age in females between 15 to 16 years only.

This study of elbow appearance and joint in which early appearance and ossification of females bones will be helpful to medico-legal expert, orthopedician, radiologist, anthropologist and anatomist. Moreover this study has ethnic and regional importance because morphometric values of mesodermal derivatives are uncertain

***Key words**: Olecranon process, epicondyle, trochlea, Karnataka*

Introduction

There are many criteria for estimation age required for medico- legal export in day today legal practice like eruption of teeth. Closure of cranial sutures, symphysis of menti of mandible, graying of hair in temporal region, despite of the facts that, the birth and death are registered by the government officials globally. Ossification centre are seen earlier in the tropical countries and females, variations in the appearance and union of ossification centers mainly attributed to various factors like climate, hereditary, race nutrition, dietary habits of gender and socio-economic status [(2)(3)(4)] . Hence attempt was made to study the age in the children of Karnataka as the habit and habitat of Karnataka differs from other states of country and abroad as well.

Material and Method

35 boys and 35 girls aged between 11 to 18 years were visiting to Subbaiah medical college hospital along with patients as attendant or visitors were selected for study. Whoever volunteers came forward. Their elbow joint ossification was studied radiologically A P and lat view of elbow joint was studied.

A P view was taken by placing the upper limb in full extension and supine position to visualize medial, lateral epicondyle and radio- capitular joint. Lateral view was taken by flexing the elbow at 90^0 degree and forearm in semi-pronated poison to visualize olecranon process and Humero-ulnar joint.

The mal- nutritious, previous fractured of elbow joints and having chronic illness like osteoporosis or Rickets were excluded from the study.

The duration of study was about 2 years .

Observation and Results

Table-1 – Boys and girls were classified 4 (11.4%) were 11 years 5(14.2%) were 12 years 7(20%) were 13 years 5(14.2%) were 14 years, 3(8.57%) were 15 years, 4(11.4%) 16 years, 3(8.57%) were 17 years, 4(11.4%) were 18 years in both sexes.

Table-2- Radiological study of elbow joint in sexes-

1. Appearance of Trochlea - (a) Not observed in males (b) observed in females at 11 years.

2. Fusion of Trochlea – (a) observed in females in 12 to 14 years and at 14 to 15 years in males show process of fusion (b) observed in females at 12 year but process of fusion completes at 14 years only

3. Appearance of Lateral Epicondyle in males it appeared at 11 to 12 and in females at 11 years only

4. Fusion of lateral epicondyle In males between 13 to 16 years but in females 13 to 14 years only

5. Fusion of medial epicondyle fusion occurs at 14 to 16 years but in females 11 to 15 years only

6. Fusion of Head of Radius – In males fusion completed between 14 to 16 years but in females 11 to 13 years only

7. Appearance of olecranon process In males between 11 to 13 but in females at 11 years only

8. Fusion of olecranon process In males fusion occurred between 17 to 18 years of age but in females between 15 to 16 years only.

Table-1: Classifications of Boys and Girls as per there age with percentage No of Patients –70

Age (Years)	Boys- 35		Girls-35		Total-70	
	No	%	No	%	NO	%
11 year	4	11.4	4	11.4	08	11.4
12 year	5	14.2	5	14.2	10	14.2
13 year	7	20.0	7	20.0	14	20.0
14 year	5	14.2	5	14.2	10	14.2
15 year	3	8.57	3	8.75	06	8.75
16 year	4	11.4	4	11.4	08	11.4
17year	3	8.57	3	8.57	06	8.57
18 year	4	11.4	4	11.4	08	11.4

Table -2: Radiological view of elbow joint ossification in both male and female at different age groups.

Appearance of Trochlea		Fusion of Trochlea		Appearance of Lateral Epicondyle		Fusion of Lateral Epicondyle		Fusion of medial Epicondyle		Fusion of Head radius		Appearance of olecranon		Fusion of olecranon	
Male	female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	11 year	14 to 15	12 to 14	11 to 12	11 year	13 to 16	13 to 14	14 to 16	11 to 15	14 to 16	11 to 13	11 to 13	11year	17 to 18	15 to16

Discussion

In the present study of estimation of age from elbow from joint in children of Karnataka, 4 (11.4%) boys and 4(11.4%) girls of 11 years old, 5(14.2%) boys and 5 (1h2%) girl of 12 years old, 7 (20%) boys and 7(20%) girls 13 years old. 5(14.2%) boys and 5(14.2%) girls of 14 years old. 3(8.57%) boys 3(8.57%) girls of 15 years 4(11.4%) boys and 4(11.4%) girls of 16 years old 3(8.5%) boys and 3(8.57%) girls belonged of 17 years 4(11.4%) boys and 4(11.4%) girls were 18 years old (Table-1). In the Radiological study. Appearance of trochlea was at 11 years of females only. Fusion of trochela was observed 14 to 15 years of male and 11 to 12 years of females. Appearance of lat epicondyle was at 11 to 12 years in males, at 11 years in females, fusion of lat epicondyle was observed at 13 to 16 years in males and 13 to 14 years of age in females, Fusion of medial epicondyle was 14 to 16 years of age in males and 11 to 15 years in females, fusion of head of Radius was 14 to 16 years of age in males, 11 to 13 years in females Appearance of Olecranon process was observed at 11 to 13 years in males and years in females fusion of olecranon process was at 17 to 18 years at males and 15 to 16 years in females (Table-2). These findings were more less in agreement with previous studies [5][6][7]

These findings of ossification varies in the study of western population [8][9]. However in both studies of India and abroad females bones have earlier Ossification than males. It could be due to higher secretion of endocrine glands, nutritional status un doubtfully there are racial, geographical and hereditary difference play vital role for earlier ossification in females bones[10]. Apart from the secretion of local enzyme called phosphatase is largely influenced by degree of ossification [11]. Moreover biochemical phenomenon includes deposition of calcium salts, metabolism of cellular elements also decide the duration of ossification

Summary and Conclusion

The present radiological study to estimate the age by elbow joint in Karnataka children will be useful to medico-legal expert, orthopedician, radiologist, anthropologist and anatomist But this study further demands genetic, embryological, hormonal, nutrition studies because the factors which determine the ossification is still obscure

This research paper was approved by Ethical committee of Subbaiah Medical college Shivamogga-(Karnataka)

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