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Research Paper

Fixation of 18 Years of Age by Radiological Study of Shoulder Joint

Medical Science

KEYWORDS : Age Estimation, shoulder joint, radiology

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ABSTRACT

Age estimation of living is most important issue to the court and to common citizen as well. Scientific estimation of age of an individual where living, dead or human remains is a problem for medical jurist in both civil and criminal matters. Age estimation cases are being referred to anatomist and forensic experts. Community relies on medico-legal expert for justice. If proper age is not given, it is injustice to the patient and profession.

Estimation of reasonably accurate age plays a pivotal role in civil/criminal cases like personal identification, fixing of criminal responsibility, judicial punishment. The present study has been undertaken to explore the pattern of diaphysis-epiphyseal union in the bones of shoulder joint in growing population of Mumbai region.

INTRODUCTION

There is variation in the timing of union of the epiphysis of bones & it has been attributed to factors like climate, nutrition, dietary habits, gender, heredity, race, and socio -economic status of population for study. Survey Committee appointed by Central Government recommended for a Zone wise Study[1]. Keeping in view the above statement and great medico legal importance of 18 years of age along with difficulty in estimating the 18 years age particularly in girls and also that no study what so ever done in Maharashtra where mixed population resides. The present study has been undertaken to explore the pattern of diaphysis-epiphyseal union in the bones of shoulder joint in growing population of Mumbai region.

AIMS AND OBJECTIVES

(1) To assess the general maturity for a known chronological age in either gender.
(2) Study of average age of appearance of ossification centers around shoulder joint.
(3) Comparative study of appearance and fusion of ossification centers on shoulder joint in boys and girls.

MATERIAL AND METHODS

This study is carried out in the Department of anatomy of M.G.M.Medical College and Hospital, Navi Mumbai. The subjects are selected randomly from various schools, from neighborhood of various faculty members and staff as well as cases attending the OPD of the Medical College and Hospital, Mumbai.

Selection Criteria for inclusion of person in present study.

For selection of subjects, following facts were recorded and considered:

(1) They should be living in Mumbai region for more than 5 years.
(2) They should be free from any physical disability or endocrinal anomaly.
(3) They should have accurate record of their date of birth.
(4) Informed expressed verbal consent of the subjects was taken before proceeding to their physical, dental and radiological examinations.
(5) Comparative study of appearance and fusion of ossification centers in boys and girls with available data of previous work carried out in India.
(6) Comparative study of appearance and fusion in boys and girls of present study with previously available foreign data.

The persons selected for study were grouped as per their stated age, viz.: 13 -14 years, 14 -15 years, 15-16 years, 16 -17 years, 17-18 years, 18-19 years, 19-20 years and 20-21 years. Age, as stated by them is further confirmed by birth certificate or entry in their school record.

The persons belonging to the age group selected for the study of either gender are included in the study irrespective of their socioeconomic, religious and educational status, each person so chosen on the basis of criteria as mentioned above are evaluated clinically in details as per Performa annexed.

After obtaining informed expressed verbal consent for their radiological and clinical examination each person is x-rayed for shoulder joint and subsequently the skiagrams are studied in detail in reference to various ossification centers, their appearance, process of fusion and post fusion scarring.

Radiological Criteria for epiphyseal fusion.The union is taken as complete when the:

a) Diaphyseo-apiphyseal space is completely obliterated and become bony in architecture and density. b) There is continuity of the periosteum between epiphysis and diaphysis with no notching at the periphery of epiphyseal line. c) Presence or absence of epiphyseal scar (a white, transverse line) has been disregarded in this connection and considered as recent complete union. For generalization; fusions in more than 75% Cases are relied upon as complete fusion.

In the present study, the following points were noted with reference to each epiphysis in either of the gender separately:

Age of the youngest subjects showing fusion of epiphysis with diaphysis.

Age of oldest subject not showing fusion of epiphysis with diaphysis.

The range of fusion with its relation to each epiphysis covering the upper and lower ages.

Age at which at least 75% or more of the cases have shown fusion.

Data Collection

Radiological data of appearance and fusion of various ossification centers were reduced to tables of various age groups along with other physical data noted previously. These data were once again, examined and tallied by experts in Anatomy and Forensic Medicine and Radio-diagnosis.

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OBSERVATION & DISCUSSION

The present study has been conducted on 260 subjects (130 girls and 130 boys). In school going subjects, date of birth was confirmed from the verbal statement, record of school, secondary school certificates etc. all the subjects were residents of Maharashtra and are residing in Mumbai for more than 5 years and were free from physical and mental illness, disability and long lasting disease.

Physical including dental and radiological examination was conducted in the Department anatomy, Grant medical college; Mumbai In formations and parameters thus deduced are recorded in the Master Chart.

In Case of boys findings of Head of humerus in present study are in accordance with the L.A. Waddel[2], Galastaun [3], T.A. Gonzales 4, J.V. Basmajian [5] and not in accordance with Lall and Nat [6], Pillai [7], S.N. Sahana [8], K.S. Narayan Reddy [9], Chaurassia B.D. [10], F.E. Camps [11], Peter L. Williams [12], S. Cochrane Shanks [13], Flecker [14], Davies and Parson [15], Bernard Knight [16] and Kragman [17].

In case of girls above cited findings of present study are in accordance with Galastaun, Pillai and Basu & Basu [18].

In case of boys findings of present study for Acromian Process corresponds with Pillai, Galastaun, KS Narayan Reddy, JV. Basmajian, Flecker, Bernard Knight and Krogman and not in accordance with C.K. parikh" Chaurassia B.D., T.A. Gonzales, F.E. Camps, Peter L. Williams, S.C. Shanks.

In case of girls the findings of present study are consistent with Galastaun and F.E. Camps and not consistent With Pillai, C.K. Parikh, K.S.N. Reddy, Chaurassia B.D., T.A. Gonzalis, Peter L. Williams, J.V. Basmarijians, S.C. Shanks, Bernard Knight and Krogman.

CONCLUSIONS:-

In case of boys findings of present study for coracoid process are consistent with Galastaun, Chaurassia B.D., T.A. Gonzales, Peter L. Williams and SC Shanks and in consistent with L.A. Waddae, C.K. Parikh, K.S. Narayan Reddy, F.E. Camps, J.V Basmajian and Krogman.

In case of girls the findings of present study corresponds with L.A. Waddale, Galastaun, KS Narayan Reddy, Chaurassia B.D., F.E. Camps, J.V. Basmajian, S.C. Shanks and Krogman and not corresponds with T.A. Gonzales and Peter L. Williams.

In the study conducted by T.A. Gonzales fusion of coracoid process occurs at a later age that present study and in the study by Peter L. Williams's fusion occurs at an earlier age that present study 17-18 years.

Table 1
Progress of epiphyseal union in different bony components of shoulder joint in boys

	Different age groups Showing % Fusion							
Age in yrs	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Head of the humerus	-	16.2	32.0	50.0	80.2	100	100	100
Acromion process	-	16.4	34.2	70.3	78.0	100	100	100
Coracoid process	-	16.2	36.2	74.2	80.4	100	100	100

Table 2 Progress of epiphyseal union in different bony components of shoulder joint in girls

	Different age groups Showing % Fusion							
Age in yrs	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21
Head of the humerus	14.0	42.2	82.0	50.0	92.4	100	100	100
Acromion process	14.0	44.0	84.0	70.3	94.0	100	100	100
Coracoid process	14.0	44.0	84.0	74.2	100	100	100	100

REFERENCE

1. Survey Committee. Survey Committee report on Medico legal practice in India 1964. Ministry of Health Page 63. | 2. Waddell LA. Lyon's Medical Jurisprudence for India, Page 56. | 3. Galstaun G. Indian Journal Medical Association, (JIMA) : 191-192. | 4.Gonzales Thomas A. Legal Medicine and Toxicology, New York. 27-28. | 5. Basmajian JohnV, Sionecker Charles E. Grant's method of Anatomy. 11th ed., p.372-373, 378-379. | 6. Lall, Rand Nat BS. Indian Journal Medical Research (IJMR), Vol 21, p 683. | 7. Pillai MJS. Indian Journal Medical Research (IJMR). 1936; 23 : 18, 1015. | 8. Sahana SN. Locomotor System Osteolog;1 Human Anatomy Vol. I. Sahana S.t\J. ed Central Book Agency, 14 Bankh Chantterjee Street Calcutta p. 314-317, 324-325. | 9. Reddy KS Narayan. Essentials of Forensic Medicine and Toxicology. 13th Edition p. 47-48. | 10. Chaurasia BD Human Anatomy. Regional and applied 2nd ed. CBS Publishers and Distributors. p. 3-11. | 11. Camps Francis E. Gradwohl's Legal Medicine 2nd ed. Bristol: John wright and Sons Ltd. p. 140-141. | 12. Williams Peter L, Dyson Mary. Gray's Anatomy 37th ed. p. 404, 408-409. | Shanks S Cochrane, Kerley Peter. A Textbook of X-ray Diagnosis Vol 4th, 3rd ed. London, p. 20-21 | 13. Flecker H. Anatomical Society of India Vol., 67 October | 14. Davis DA and Parson. Journal of Anatomy 62, Page 56. | 15. Knight, Bernard. Age Estimation: In, Forensic Pathology, Edward Amold, A division of Hodder & Sttoughton London. p. 109-114- 118 | 16. Krogman WM. The human skeleton in Forensic medicine Charled C Thomas Publisher, Illinois U.S.A. | 17. Basu SK and Basu S. Indian Journal Paediatrics 5; 201. | 18. Parikh CK. "Parikh textbook of Med. Jurisprudence and Toxicology, 5th ed. 1999. C.B.S. Publisher and distributor. p. 2.5-2.14. | |