International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

IJMRP

Original Research Article.

Age Estimation from Fusion of Manubrium & Xiphoid Process with Sternal Body: A Radiological Study at a Tertiary Care Centre

Anurag Thapar

Assistant Professor, Department of Forensic Medicine,
Krishna Mohan Medical College & Hospital, Mathura, Uttar Pradesh, India.

ABSTRACT

Background: Among the scientific method, ossification of bone and dental examination are more reliable scientifically for age estimation. The present study was carried out to estimate age from Fusion of Manubrium & Xiphoid Process with Sternal Body in living Individuals.

Materials and Methods: The present study was carried out to estimate age from Fusion of Manubrium & Xiphoid Process with Sternal Body in living Individuals. A total of 168 individuals of 25-60 years of age were included in the study. The X-Ray Sternum Lateral View was taken of study cases after obtaining their written informed consent. The status of Fusion of xiphisternum and manubrium with the body of sternum was studied.

Results: In the present study a total study sample size was 168 patients in which 84 patients were males and 84 patients were females. The males, xiphoid process shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 males shows fusion, in the age group 41-45yrs 3 males shows fusion, in the age group 46-50yrs 5 males shows fusion, 51-55yrs 2 males shows fusion, 56-60yrs 1 male shows fusion. In females, xiphoid process shows non fusion in age group of 25-30 years. In the age group 31-35yrs 1 female shows fusion, 36-40yrs 2 females shows fusion, in the age group 41-45yrs 3 females shows fusion, in the age group 46-50yrs 4 females shows fusion, 51-55yrs 9 females shows fusion, 56-60yrs 11 female shows fusion. Maximum fusion was in the age group 56-60 yrs (91.66%). The males, manubrium shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 males shows fusion, in the age group 41-45yrs 3 males shows fusion, in the age group 46-50yrs 5 males shows fusion, 51-55yrs 2 males shows fusion, 56-60yrs 1 male shows fusion. In females, manubrium process shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 females shows fusion, in the age group 41-45yrs 4 females shows fusion, in the age group 46-50yrs 5 females shows fusion, 51-55yrs 10 females shows fusion, 56-60yrs 11 female shows fusion. Maximum fusion was in the age group 56-60yrs (91.66%).

Conclusion: The present study concluded that Maximum fusion of xiphoid process and manubrium was in the age group 56-60yrs (91.66%).

Keywords: Xiphoid Process, Age Estimation, Manubrium.

***Correspondence to:**

Dr. Anurag Thapar,
Assistant Professor,
Department of Forensic Medicine,
Krishna Mohan Medical College & Hospital,
Mathura, Uttar Pradesh, India.

Article History:

Received: 13-08-2017, **Revised:** 03-09-2017, **Accepted:** 27-09-2017

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2017.3.5.091	

INTRODUCTION

Verification or determination of the age is prerequisite for personal identification in living as well as dead and age estimation is one of the important tasks for a medico-legal practice. In general, the method for age estimation is same whether the person is living or dead. It is carried out under three heads namely physical, dental and radiological examination.[1] General physical examination includes measurements of height & weight, presence of secondary sexual characters, greying of body hair & eruption of teeth which varies/ show changes depending on the age of the individual. Ossification of bones includes both appearance of ossification centre and fusion of the same. Among the scientific method, ossification of bone and dental examination are more reliable scientifically. Age estimation can be done with fair amount of accuracy by general physical examination and dental examination up to the age of 25 years.[2,3] The young individual has various factors for age estimation. On the contrary, the elderly persons have very few identifying factors like fusion of sternal bones, fusion of skull sutures, changes that occur in the pubic symphysis, degenerative changes and application of Gustafson's formula.[4] The present study was carried out to estimate age from fusion of manubrium & xiphoid process with sternal body in living individuals.

MATERIALS AND METHODS

The present study was carried out to estimate age from fusion of manubrium & xiphoid process with sternal body in living individuals. A total of 180 individuals participated in this study. The subjects included were individuals of 25-60 years of age. The subjects do not have any disease/deformity pertaining to bones or chronic disease affecting the general health. The X-Ray Sternum Lateral View was taken of study cases after obtaining their written informed consent. The status of fusion of xiphisternum and manubrium with the body of sternum was studied.

RESULTS

In the present study a total study sample size was 168 patients in which 84 patients were males and 84 patients were females. The males, xiphoid process shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 males shows fusion, in the age group 41-45yrs 3 males shows fusion, in the age group 46-50yrs 5 males shows fusion, 51-55yrs 2 males shows fusion, 56-60yrs 1 male shows fusion. In females, xiphoid process shows non fusion in age group of 25-30 years. In the age group 31-35yrs 1 female shows fusion, 36-40yrs 2 females shows fusion, in the age group 41-45yrs 3 females shows fusion, in the age group 46-50yrs 4 females shows fusion, 51-55yrs 9 females shows fusion, 56-60yrs 11 female shows fusion. Maximum fusion was in the age group 56-60yrs (91.66%). The males, manubrium shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 males shows fusion, in the age group 41-45yrs 3 males shows fusion, in the age group 46-50yrs 5 males shows fusion, 51-55yrs 2 males shows fusion, 56-60yrs 1 male shows fusion. In females, manubrium process shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 females shows fusion, in the age group 41-45yrs 4 females shows fusion, in the age group 46-50yrs 5 females shows fusion, 51-55yrs 10 females shows fusion, 56-60yrs 11 female shows fusion. Maximum fusion was in the age group 56-60yrs (91.66%).

Table 1: Fusion between Xiphoid process & body of sternum

Age group(yrs)	No. of male cases	Males-complete fusion	Males-no fusion	No. of female cases	Females-complete fusion	Females-no fusion	Total % showing fusion
25-30	12	0	12	12	0	12	0(0%)
31-35	12	0	12	12	1	11	1(4.16%)
36-40	12	2	10	12	2	10	4(16.66%)
41-45	12	3	9	12	3	9	6(25%)
46-50	12	5	7	12	4	8	9(37.5%)
51-55	12	10	2	12	9	3	19(79.16%)
56-60	12	11	1	12	11	1	22(91.66%)
Total	84	31	53	84	30	54	61(36.30%)

Table 2: Fusion between Manubrium & body of sternum

Age group(yrs)	No. of male cases	Males-complete fusion	Males-no fusion	No. of female cases	Females-complete fusion	Females-no fusion	Total % showing fusion
25-30	12	0	12	12	0	12	0(0%)
31-35	12	0	12	12	0	12	0(4.16%)
36-40	12	2	10	12	2	10	4(16.66%)
41-45	12	3	9	12	4	8	7(29.16%)
46-50	12	5	7	12	5	7	10(41.66%)
51-55	12	10	2	12	10	2	20(83.33%)
56-60	12	11	1	12	11	1	22(91.66%)
Total	84	31	53	84	32	52	63(37.5%)

DISCUSSION

Study of human sternum as an individual parameter for determination of age and sex has been attempted by various workers. First recorded data is by Wenzel (1788). He described the difference in the ratio between the length of manubrium and that of mesosternum in both sexes. It was followed by Fiegel (1837), Dwight (1890), and Ashley (1956).[5]

In the present study a total study sample size was 168 patients in which 84 patients were males and 84 patients were females. The males, xiphoid process shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 males shows fusion, in the age group 41-45yrs 3 males shows fusion, in the age group 46-50yrs 5 males shows fusion, 51-55yrs 2 males shows fusion, 56-60yrs 1

male shows fusion. In females, xiphoid process shows non fusion in age group of 25-30 years. In the age group 31-35yrs 1 female shows fusion, 36-40yrs 2 females shows fusion, in the age group 41-45yrs 3 females shows fusion, in the age group 46-50yrs 4 females shows fusion, 51-55yrs 9 females shows fusion, 56-60yrs 11 female shows fusion. Maximum fusion was in the age group 56-60yrs (91.66%). The males, manubrium shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 males shows fusion, in the age group 41-45yrs 3 males shows fusion, in the age group 46-50yrs 5 males shows fusion, 51-55yrs 2 males shows fusion, 56-60yrs 1 male shows fusion. In females, manubrium process shows non fusion in age group of 25-35 years. In the age group 36-40yrs 2 females shows fusion, in the age group 41-45yrs 4 females shows fusion, in the age group 46-50yrs 5 females shows fusion, 51-55yrs 10 females shows fusion, 56-60yrs 11 female shows fusion. Maximum fusion was in the age group 56-60yrs (91.66%).

Garg et al examined fusion of manubrium with the body of the sternum in 135 males and 27 females in state of Punjab of India. They observed complete fusion of manubrium with the body of the sternum in male subjects.[6]

Gautam et al Studied on human sternum as an index of age and sex. Authors have studied 100 sterna procured from the cadavers brought for postmortem examination at Bhavnagar. Only those cases with age more than 15 years were considered. They concluded that the fusion of xiphoid process with body of sternum starts after 30 years and in most of the cases the fusion is completed after 50 years. The fusion of Manubrium with the body of sternum begins after the age of 40 and completed after the age 55 years.[7] As per the study of Vora D.H. in male the age of fusion of xiphoid with the body of sternum is 34 to 45 years while in females this age is 35 to 44 years.[8]

Moreover, a study done in Punjab on time of fusion of the human mesosternum with manubrium & xiphoid process in sterna obtained from 772 male and 208 female subjects revealed that the xiphoid process did not fuse with the body of the sternum in males below 18 years and female below 21 years.[1]

CONCLUSION

The present study concluded that Maximum fusion of xiphoid process and manubrium was in the age group 56-60yrs (91.66%).

REFERENCES

1. Jit I, Bakshi V. Time of the human mesosternum with manubrium and xiphoid process. Ind J Med Res 1986 Jan; 83:322.
2. Mukherjee JB. Identification. In: JB Mukherjee`s Forensic Medicine and Toxicology. Calcutta: Academic Publishers; 2007. p. 124.
3. Reddy KSN. Identification. In: The Essentials of Forensic Medicine and Toxicology. Hyderabad: K sagunadevi; 2011. p. 72.
4. Wadhawan M et al. Correlation between age and degree of fusion involving sternal joints. Indian Journal of Forensic Medicine and Pathology. 2010; 3(1): 83-87.
5. Kaneriya D, Suthar K, Patel V, Umarvanshi B, Mehta C, Tailor C. Morphometric study of sternum for determination of sex. CIBTech Journal of Bio-Protocols. 2013;2(2):6-13.
6. Garg A, Goyal N, Gorea RK. Radiological Age Estimation from Xiphi-Sternal Joint in Living Person. J Indian Acad Forensic Med. 2011; 33(1):27-29.
7. Gautam R.S. The human sternum- as an index of age & sex. Journal of the Anatomical society of India. 52(1): 2003-01-2003-12.
8. Vora D H a Study of fusion of different segments of sternum and medial end of clavicle, Dissertation submitted to the Saurashtra University April 2011.

Source of Support: Nil.

Conflict of Interest: None Declared.

Cite this article as: Anurag Thapar. Age Estimation from Fusion of Manubrium & Xiphoid Process with Sternal Body: A Radiological Study at a Tertiary Care Centre. Int J Med Res Prof. 2017 Sept; 3(5): 450-52. DOI:10.21276/ijmrp.2017.3.5.091