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Original Research Article

Hyoid Bone Fusion Assessment Amongst in Different Age Groups: An Observational Study

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ABSTRACT

Background: The greater cornua present in the hyoid bone is fused with the body at a particular age. This fusion of hyoid bone is of useful help in evaluating the age of unknown dead bodies. Earlier studies on 170 excised hyoid bones extracted from dead bodies between the age group of 20-65 years of Indian origin have also been done. The present study was conducted with the aim to determine the hyoid bone fusion at different age groups.

Materials and Methods: The present analysis was performed in the Department of Anatomy, Dr. Panjabrao Deshmukh Memorial Medical College. Amravati, Maharashtra (India) for period of 6 months. The subjects between 18-65 years of age were included in the study. Total of 50 subjects were enrolled in the study. The bone structure and fusion of greater cornua to body were studied. All the data was arranged in a tabulated form and an age interval of 5 years was considered. The results were analysed using SPSS software. Student t test was used for analysis. Probability value of less than 0.05 was considered as significant.

Results: There were total 3 subjects between 18-25 years of age and amongst them 2 were males and 1 was female. There were total 7 subjects between 25-30 years of age and amongst them 5 were males and 2 were females. There were 3 subjects with non-fusion between 18-25 years. There were 6 subjects with unilateral fusion and 1 with non-fusion between 25-30 years of age.

Conclusion: From the present study we concluded that non fusion was seen amongst younger age groups and there were majority subjects with unilateral fusion and few with bilateral fusion amongst subjects with higher age group.

Keywords: Hyoid, Grater Cornu, Fusion.

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INTRODUCTION

The greater cornua present in the hyoid bone is fused with the body at a particular age. This fusion of hyoid bone is of useful help in evaluating the age of unknown dead bodies. It is also useful in mechanical asphyxia cases where the death is due to compression of the neck as fracture of the bone is more possible if it is fused. So period of fusion of hyoid and its morphology is of wide interest for the Forensic Pathologists.[1-3] Along with this the fusion of hyoid has been studied in association to mastication and pathology of the sleep apnea amongst the susceptible individuals.[4]

Several studies have shown hyoid bone fusion and its association with age. The age range at which the greater cornu of bone fuses with the body is also seen to be associated with population studied and the methods employed for estimation of association.[5]

Some researchers have reported that the fusion of hyoid bone occurs only after the age of 40 years while some other investigators have observed that the hyoid bone fusion occurs at an earlier age. Earlier studies on 170 excised hyoid bones extracted from dead bodies between the age group of 20-65 years of Indian origin have also been done.[6] The present study was conducted with the aim to determine the hyoid bone fusion at different age groups.

MATERIALS AND METHODS

The present analysis was performed in the Department of Anatomy, Dr. Panjabrao Deshmukh Memorial Medical College. Amravati, Maharashtra (India) for period of 6 months. The subjects between 18-65 years of age were included in the study.

Total of 50 subjects were enrolled in the study. The study was approved by the institutional ethical board. Only subjects of known age were enrolled in the study. Cases with compression of neck or fracture of hyoid were not enrolled in the study. Dissection of the neck structures was performed carefully to extract the hyoid bone. Hyoid bone was removed with extreme care so as the bone does not breakdown and be muddled with fracture of hyoid bone. The hyoid bone from each subject was placed in a labeled box and buried in the earth for around four weeks for the removal of soft tissues attached to the bone. After that it was taken out, cleaned and air dried. The bone structure and fusion of greater cornua to body were studied. All the data was arranged in a tabulated form and an age interval of 5 years was considered. The results were analysed using SPSS software. Student t test was used for analysis. Probability value of less than 0.05 was considered as significant.

Table 1: Total number of subjects in the study with gender distribution

Age group	Total subjects	Male	Female
18-25	3	2	1
25-30	7	5	2
30-35	6	4	2
35-40	4	2	2
40-45	9	5	4
45-50	3	2	1
50-55	7	4	3
55-60	9	5	4
60-65	2	2	0
Total	50	31	19

Table 2: Fusion at different age groups

Age group	Unilateral fusion	Bilateral fusion	Non fusion
18-25	0	0	3
25-30	6	0	1
30-35	2	5	0
35-40	0	4	0
40-45	0	9	0
45-50	2	1	0
50-55	0	7	0
55-60	9	0	0
60-65	0	2	0
Total	19	28	4

RESULTS

Table 1 shows the number of subjects with gender distribution amongst the study. There were total 3 subjects between 18-25 years of age and amongst them 2 were males and 1 was female. There were total 7 subjects between 25-30 years of age and amongst them 5 were males and 2 were females. There were total 6 subjects between 30-35 years of age and amongst them 4 were males and 2 were females. There were total 4 subjects between 35-40 years of age and amongst them 2 were males and 2 were females. There were total 9 subjects between 40-45 years of age and amongst them 5 were males and 4 were females. There were total 7 subjects between 50-55 years of age and amongst them 4 were males and 3 were females. There was a total of 50 subjects with 31 males and 19 females.

Table 2 shows the fusion at different age groups. There were 3 subjects with non-fusion between 18-25 years. There were 6 subjects with unilateral fusion and 1 with non-fusion between 25-30 years of age. There were 2 subjects with unilateral fusion and 5 with bilateral fusion between 30-35 years. There were 2 subjects with bilateral fusion between 60-65 years of age. There were 9 subjects with unilateral fusion between 55-60 years of age.

DISCUSSION

The present study was conducted to determine the hyoid bone fusion at different age group. Studies performed by other authors showed unswerving results. Study conducted by Gupta A et al to evaluate the age group of fusion of greater cornua of hyoid bone with the body of hyoid bone. Age of the fusion of hyoid bone can be useful in estimating the age of the subject, especially of the unknown dead subjects and where only the skeletal remains of the are present. A subject of neck compression will more likely have a fractured hyoid bone if his/her bone is fused. Indian scientists have shown that the fusion of bone occurs only after the 40 years of age. Studies performed by foreign researchers have seen that hyoid bone was fused at earlier years of age i.e. between 30-40 years of age. In the present study, there were total 3 subjects between 18-25 years of age and amongst them 2 were males and 1 was female. There were total 7 subjects between 25-30 years of age and amongst them 5 were males and 2 were females. There were total 6 subjects between 30-35 years of age and amongst them 4 were males and 2 were females. There were total 4 subjects between 35-40 years of age and amongst them 2 were males and 2 were females. There were total 9 subjects

between 40-45 years of age and amongst them 5 were males and 4 were females. There were total 7 subjects between 50-55 years of age and amongst them 4 were males and 3 were females. There were a total of 50 subjects with 31 males and 19 females. According to Miller KW et al who used an image analysis protocol to obtain a series of 30 measurements on the digitized radiographs of the 315 hyoid bones obtained from people of the known age and sex. The grade of fusion of the greater cornua to the body of hyoid bone was also recorded. Significant gender differences was seen the shape of hyoid like the distal ends of the greater cornua of females are significantly long compared to those of men.[6,7] As per the present study, there were 3 subjects with non-fusion between 18-25 years. There were 6 subjects with unilateral fusion and 1 with non-fusion between 25-30 years of age. There were 2 subjects with unilateral fusion and 5 with bilateral fusion between 30-35 years. There were 2 subjects with bilateral fusion between 60-65 years of age. There were 9 subjects with unilateral fusion between 55-60 years of age. Another similar study showed the age of fusion of the 200 hyoid bones out of which 133 males and 67 females between the age range from 18 to 85 years amongst North West Indians[8] found that evaluating the age by using the hyoid bone is not as reliable as the time of fusion of greater cornu with the body is irregular in nature. Ucar FI et al and Kim D conducted similar study and found gender differences amongst the rate of fusion of greater cornu with the body.[9,10]

CONCLUSION

From the present study we concluded that non fusion was seen amongst younger age groups and there were majority subjects with unilateral fusion and few with bilateral fusion amongst subjects with higher age group.

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