COMPARISON OF RAMUS IN AID OF SEX DETERMINATION (ORGINAL STUDY)

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ABSTRACT :

Introduction : Identification of sex is an important issue in forensic dentistry and in medico-legal investigations. The skeletal components most often investigated for sex determination are the pelvis and skull with mandible. In human remains, next to pelvis, mandible is used to estimate age, sex, and race. Mandibular ramus can be used to determine sex. Study aimed to measure, compare, and evaluate various measurements of ramus.

Materials and methods : Around 35 dried samples of mandible were collected from the anatomy department of Saveetha dental College. The multiple samples were collected and measured using vernial calliper to measure the ramous of the mandible in aid for sex determination . The results were obtained and tabulated in the form of bar graphs.

Results: The ramus of the mandible using the parameters of length and breadth of the ramus and its variations were found effective in determining the gender of 30 mandibles.

Conclusion: This study concludes that ramus of the mandible can be a determinator in gender identification in ForensicDentistry .

Keywords : Mandible ,Ramus, Sex determination

Running title : Comparison Of Ramus In Aid Of Sex Determination (Orginal Study)

INTRODUCTION:

Determination of sex in skeletal remains is an important part of archaeological and many medicolegal cases, particularly where the bodies are damaged beyond recognition as in mass disasters. Next to pelvis, skull with mandible plays a vital role in the identification of age, sex and race. By radiological examination, sex determination of skull is possible to an extent of 88%. Panoramic radiographs are reproducible, gives accurate linear and angular measurements on mandibles.With the above background this present study was being aimed to evaluate various measurements of ramus, gonial angle, bigonial width on panoramic radiographs and its role in sexual dimorphism and also to ascertain an accurate method for sex determination.Identification of sex is an important issue in forensic dentistry and in medico-legal investigations. The skeletal components most often investigated for sex determination are the pelvis and skull with mandible. (1)Study aimed to measure, compare, and evaluate various measurements of ramus, gonial angle and bigonial width as observed on panoramic radiographs.Identification of human skeletal remains an important step during mass disasters. In forensic investigations and in medicolegal cases, identification of sex is an important aspect, followed by age determination. It depends on the availability of human skeletal remains. When the entire skeleton is present, identification of age and sex can be done with accuracy. However, in mass disasters, complete human skeletal remains cannot be available. Hence, it depends on availability of bony fragments.In human

remains, pelvis and skull are the important human skeletal remains for sex determination. When an intact skull is absent and only fragments of skull bones are present, in those situations the mandible plays an important role in gender determination(2). Among all the bones of the skull, the mandible is the largest, strongest, and movable part of the skull. Due to compact bones which are very dense, they are more durable and well preserved than many other bones(3). Masticatory forces exerted by males and females are different. These forces influence the sexual dimorphism in the mandible. Identification of the human remains is done by comparing ante and post-mortem radiographs (4). The main aim of the study is to determine sex using mandibular ramus by considering all the parameters.

Our team has extensive knowledge and research experience that has translate into high quality publications
(5),(6),(7),(8),(9),(10),(11),(12),(13),(14),(15),(16),(17),(18),(19),(20),(21),(22),(23),(24)

MATERIAL AND METHODS

The study was carried out on 30 dry human skulls of known sex and age which were taken from The Department of Anatomy, Saveetha Dental College, Chennai .15 mandibles of male skull and 15 mandibles of the female skull were observed and collected for evaluation. Any skull bone with gross pathology or deformity were excluded from the study. The morphology of right and left ramus of the mandible distance was examined and was measured using a digital sliding vernier caliper. The length of the mandible was measured and noted. The data collected was then calculated to derive the determination of sex through finding the length of ramus . The obtained ramus of the mandible distance was represented graphically through a bar chart. The sex determination through the ramus distance was depicted .

Results and discussion :

Figure 1 : The graph represents the count and gender regarding the maximum ramus breadth in which the maximum breadth of the ramus is from 2.00 % to 3.00 % .

Figure 2 : The picture shows the ramus of the human.

Figure 3 : The figure represents a graph between the count and gender of the minimum ramus breadth from 1.00 % to 2.00 % .

Figure 4 : This picture shows the vernier caliper in measuring of the breadth of the ramus of the mandible

Results Discussion:

By analysing the graph of present study we conclude that though there is difference in the Maximum length and minimum length of the ramus among males and females was not significantly different when done through The descriptive analysis was done for both orbital and palatal indices using the spss software 22 . The landmarks used in this study for the ramus of the mandible location can be easily located in living subjects(25).The anatomy of the ramus of the mandibles have become increasingly important in forensic odontology for gender identification . The graph (figure1) depicts that the maximum ramus breadth of men are in the range of 70-90 mm and for females the range of maximum ramus breadth (26).The graph (figure 2) states that Minimum ramus breadth men are in the range of 115-120mm and for females the minimum ramus breadth is in a range of 105-114 mm. The graph (figure 3) states that condylar distances of men are of range 100-120 mm and for females they are expected to be at the range of 91-100 mm.((27) .

Forensic odontology is the application of dental principles to legal issues .Sex determination is a subset of forensic odontology, and it's crucial, particularly when there's no other details about the deceased. In the case of unfortunate incidents, such as chemical and nuclear weapon explosions, determining a person's sex becomes the first priority in the forensic investigator's identification process.Various methods have been used for the identification of sex. Sex determination can be done by Morphological analysis (of the tooth, skull , mandible and other soft tissues of oral and paraoral region) or molecular analysis(28). The mandible is the largest and the hardest bone of the skull and a treat in shape better than the other bones in the field of forensic odontology.The characteristics of mandible lends itself extremely useful for determination of sex. Several non metric traits of the mandible have been associated with gender All the previous articles have stated about the different parameters of mandible i.e. the ramus , the coronoid process, gonial angle ,gonial plane,maxillary arch width are used for gender identification of male and female . In this study a new parameter of the mandible i.e ramus of the mandible distance(28) was measured in mandibles to prove it is also an important parameter for gender identification.

Conclusion

We conclude from the present that though there is a difference in the Maximum length and minimum length of the ramus among males and females it was not significantly different. The descriptive analysis was done for both orbital and palatal indices using the spss software 22 .Therefore the Ramus can be used as sex determination. It can be used as a adjunct in sex determination .

CONFLICT OF INTEREST : Not declared

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