ORIGINAL RESEARCH PAPER
Volume-6 | Issue-11 | November-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

DETERMINATION OF SEX WITH THE HELP OF MANDIBLE

Anatomy

Dr. Vijay Kumar R Waghmare Associate Professor, Department Of Anatomy, Karwar Institute of Medical Sciences, Karwar

Dr. Baswaraj dhabale Assistant Professor, Department Of Anatomy, Karwar Institute of Medical Sciences, Karwar

Dr. Rupali V. waghmare Assistant Professor, Department of Physiology, Karwar Institute of Medical Sciences, Karwar

ABSTRACT

Introduction: Examination of human skeleton is very important to identification of deceased and determination of sex for the medico legal and anthropological work. The mandible is the largest and hardest facial bone, that commonly resist post mortem damage and forms an important source of information about sexual dimorphism.
Aim: The purpose of the study is to analyze sexual dimorphism in the mandibles of Maharashtrain population.
Materials and methods: 100 (males 50, female 50) human adult, dry, complete mandibles from various medical colleges of Maharashtra.
Results: After obtaining all measurements unpaired't-test'was performed. It shows statistically significant sex difference.
Conclusion: - The present study is very helpful for the sex difference of mandible in Maharashtrain population.

KEYWORDS

Human mandible, Bicondylar breadth, Bicoronoid breadth, Maharashtrain population

INTRODUCTION:

The sex of an unknown individual can be determined based on the data from the metric features and morphology of skull and mandible, soft tissues and also by DNA analysis of teeth.[1] In human skeleton, the skull is the second most sexually dimorphic region apart from pelvis. As part of skull, the mandible may also be considered sexually dimorphic. The mandible is one of the strongest bones in the human body and persists in a well preserved state much longer than any other bone.[2] When dental records are not available or doesn't exist, sex determination of unknown human mandibles are done by the usual methods of size and muscular markings become unreliable. Male and female mandibles are distinguished by general size, chin shape, gonial flaring and the gonial angle.[3] In cases where intact skull is not found, mandible may play a vital role in sex determination, as it is the most dimorphic bone of skull.

The mandible is a Latin word which means lower jaw. Mandere means to chew. Thus the word mandible is derived. The mandible is the largest, strongest and lowest bone in the face. Mandible retains its shape better than other bones, so it plays an important role Forensic osteology and Anthropological works. Assessment of sex by morphological features is subjective, and many fine peculiarities may be missed or misinterpreted by an inexperienced examiner. Therefore the present study was done to determine the new features to determine sex using mandible apart from usual distinguishing features.

MATERIALAND METHODS:

The study was done on 100 adult dry, complete, undamaged human mandibles present in the various Government Medical Colleges in Maharashtra in Government Medical College, Miraj, Grant Medical College, Mumbai, Government Medical College, Nagpur, Government Medical College, and Aurangabad available in Museum of Department of Anatomy. In two groups Males (n = 50) & Females (n = 50). Now the metric parameters were measured with a Stainless Steel Vernier Calliper of 0.1mm precision. The Parameters used in the present study were:

1. BICONDYLAR BREADTH-the Straight distance between the most lateral points on the two condyles.

1. **Bicondylar breadth:** - the perpendicular distance between the most lateral points on the two Bicondylar process.
2. **Bicoronoid breadth** – the perpendicular distance between the most lateral points on the two coronoid process.

Instrument used: Vernier Caliper.
C) Data management and statistical analysis.

After all the measurements were done, observations in the male and female bones were statistically analyzed. Student "t" test was performed. Mean and standard deviation were calculated for the ranges of each parameter of both the genders.' P 'value was determined to assess the significance of the observations.

METHODS:

The study was conducted using human mandibles obtained the total number of mandibles used was 100. The measurements were taken using a manual verniercaliper

RESULT:

The results of the study were as follows:
On the basis of the morphological parameters 50 of the mandibles were categorized as male while 50 as females.

In males the shape of symphysis menti was square, the gonion flare was everted and the muscular markings were more prominent.

In the females the shape of symphysis menti was round, the gonion flare was inverted and the muscular markings were smooth or less prominent.

In the present study the Bicondylar breadth was 115 ± 0.62 mm in males and 101 ± 0.52 mm in females and Student's 'test was done for the two sets of mean values. P value was <0.0001 and indicated that the results were statistically extremely significant.

Bicondylar breadth:

In the present study, the mean value of the bicondylar breadth of mandible was found to be 112.72 mm in males and 107.48 mm in females. Standard deviation for bicondylar breadth in male was 5.57 and in female was 7.68. The sex differences in mean values of bicondylar breadth of male and female was statistically significant ($p<0.0001$) for mandible bone.**13** All of the studies showed statistically significant difference between male and female mandible values. Present study also shows similar findings.

Coronoid breadth:

In male mandibles the mean breadth was found to be 9.4880 cm, the range was found to be 8.50 – 10.80 (2.30) and the standard deviation was 0.61395. In female the mean breadth was found to be 9.0923 cm, the range was found to be 8.30 – 9.60 (1.30) and the standard deviation was 0.41122. The sex differences in mean values of coronoid breadth of male and female mandibles is statistically significant ($p<0.05$).

Bicondylar breadth:

In male mandibles the mean breadth was found to be 11.0680 cm, the range was found to be 9.70 - 12.10 (2.40) and the standard deviation was 0.50392. In female the mean breadth was found to be 10.6077 cm, the range was found to be 9.30 – 11.50 (2.20) and the standard deviation was 0.72280. The sex differences in mean values of bicondylar breadth of male and female mandibles is statistically significant ($p<0.05$).

DISCUSSION:

Bicondylar breadth:

Vinay et al. in their study with 250 mandibles the mean value of bicondylar breadth of male mandibles was found to be 11.34 cm and in female mandibles was 10.82 cm.[4] The standard deviation for bicondylar breadth in male mandibles was 0.55 and in female mandibles was 0.70. Ongkana studied with 102 mandibles of individuals who had lived in the upper part of northern Thailand the mean value of bicondylar breadth of male mandibles was found to be 12.38 cm and in female mandibles was 11.61 cm.[5] The standard deviation for bicondylar breadth in male mandibles was 0.63 and in female mandibles was 0.59. Jayakaran et al. in their study with 207 mandibles the mean value of bicondylar breadth of male mandibles was found to be 11.26 cm and in female mandibles was 10.77cm.[6] The standard deviation for bicondylar breadth in male mandibles was 0.53 and in female mandibles was 0.53.Ranganath et al. in their study with 111 mandibles the mean value of bicondylar breadth of male mandibles was found to be 10.98 cm and in female mandibles was 11.51 cm. The standard deviation for bicondylar breadth in male mandibles was 1.48 and in female mandibles was 0.93. Franklin et al. in their study with 225 mandibles the Mean value of Bicondylar breadth of male mandibles was found to be 11.36 cm and in female mandibles was 10.86 cm. The standard deviation for bigonial breadth in male mandibles was 0.60 and in female mandibles was 0.58.

In the present study the mean value of Bicondylar breadth of male mandibles was found to be 11.0680 cm and in female mandibles was 10.6077 cm. The standard deviation for bicondylar breadth in male mandibles was 0.50392 and in female mandibles was 0.72280.

Coronoid breadth:

Kanchankumar et al. in their study with 82 mandibles the mean value of coronoid breadth of male mandibles was found to be 9.53 cm and in female mandibles was 9.13 cm.[7] The standard deviation for coronoid breadth in male Mandibles were 0.065 and in female mandibles was 0.113. In the present study the mean value of coronoid breadth of male mandibles was found to be 9.4880 cm and in female mandibles was 9.0923 cm. The standard deviation for Coronoid breadth in male mandibles was 0.61395 and in female mandibles was 0.41155. The values of male were comparatively more than female mandibles.

CONCLUSION:

Determination of sex from skeletal remains has high forensic importance. The determination of sex by analyzing the morphological aspects depends on the expert's ability. The present study has helped us to determine sex using metric parameters like, Bicondylar breadth and coronoid breadth, which are easy to determine and more reliable compare to traditional non metric method.

REFERENCES:

1. Rai,J. Kaur. Sex determination methods in forensic odontology. Evidencebased forensic dentistry. Doi.10.1007/978-3-642-28994- 1_5@ springerverlag berlin heidelberg 2013; 73-79.
2. sexdetermination using nonmetric characteristics of the mandible in koreans.j forensic sci 2006;51:1376-82.
3. Reddy ksn. Identification. The essentials of forensic medicine and toxicology. 24th ed. Hyderabad: k suguna devi; 2005. Pp. 79–81
4. Vinay, G., Gowri, S.R.M. and Anbalagan, J. (2013) Sex Determination of Human Mandible Using Metrical Parameters.*Journal of Clinical and Diagnostic Research*, 7, 2671-2673.
5. Ongkana, N. and Sudwan, P. (2009) Gender Differences in Thai Mandibles Using Metric Analysis. *Chiang Mai Medical Journal*, 48, 43-48.
6. Jayakaran, F., Rajangam, S., Janakiram, S. and Thomas, I.M. (2000) Sexing of the Mandible. *Anatomica Karnataka*, 1, 11-16.
7. Kanchankumar p. Wankhede,rajesh v. Bardale1,gunwant r. Chaudhari,namdeo y. Kamdi.determination of sex by discriminant function analysis of mandibles from a central Indian population.j forensic dental sciences / january-april 2015 / vol 7 / issue 1, 80