



SEX DETERMINATION USING THE RIGHT SIDE OF MANDIBULAR RAMUS HEIGHT IN THE SOUTH INDIAN POPULATION

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Abstract

Background: Identity are the characteristics including physical, functional, normal or pathological features defining a person. Absence of dry skull or any other part important for identification, mandible plays a predominant role. Mandibular ramus helps in sex determination with the development stages of the mandible, rate of growth, which are definitely different in both sexes.

Aim: This study aims to determine the sex using right side of mandibular ramus height.

Materials and method: Panoramic radiographs were collected from a database from the forensic odontology department which was later subjected to planmeca and spss for the descriptive analysis.

Results: The results obtained for the age group of 21-30 for the females is 66.5600 ± 4.7 and for the males is 78.0300 ± 6.3 .

For the age group of 31 to 40 for female the mean value is 66.0200 ± 5.6 and for the males the mean value is 76.0200 ± 7.8

For the age group of 41 to 50 for female the value is 68.5500 ± 3.8 and for the male it is 73.4400 ± 4.8

Conclusion: The study concludes that there is no significant relation between sex determination using right side of mandibular ramus height. Males showed greater mean values than the females.

Keywords: Height, Mandible, Ramus, Sex determination.

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1. Introduction

Identity is a set of characteristics which involve physical, functional, normal or pathological features defining a person. Gender identification is an important part of the medico-legal field and the anthropological field¹. After the attainment of puberty, sex determination becomes more precise. Clearcut differences can be seen in the pelvis² and skull.³ It becomes the foremost step of identification in cases of mass disasters, hurricanes, bomb explosion leading to many damaged bodies which cannot be recognised and becomes quite challenging.

It is well known that adult human pelvic region⁴ shows great degree in sex determination as tested in ischiopubic index⁵

Cases which involve an absence of dry skull⁶ or any other part important for identification, mandible plays a predominant role in sex determination as it is largest and strongest bone.⁷

With the help of a complete skeleton, estimation and gender analysis can be made with almost 90 to 100% accuracy. It's difficult to determine the identity when the skeleton is not complete or in fragments as in case of mass disaster where bodies are severely damaged.⁸

In this case mandible comes into having a key role in determination of sex⁹. The compact bones and the layers covering the mandible⁷ which are dense make it more preserved compared to other structures. Osteometric studies on this can prove really helpful.¹⁰

Nowadays to analyse and overview maxillofacial complex rotational panoramic radiography is put into use widely. Human identification can be done using antemortem and postmortem radiographs.¹¹

Mandibular ramus can help in sex determination with the development stages of the mandible, rate of growth, time period are definitely different in both sexes. Sexual dimorphism is shown to a greater extent in the mandible¹². It is the most durable and one of the strongest bones¹³. Greater amount of force is subjected to the ramus of the mandible than other bones of the skull because of the forces of mastication.¹⁴

There are many existing studies concerned with the use of estimation of sex determination¹⁵ with the use of gonial angle for estimation.^{7,16}. Our team has

extensive knowledge and research experience that has translate into high quality publications¹⁷⁻²⁶.

The aim of the study is to measure the right side of mandibular ramus height and use it in the sex determination. This study can conclude whether the mandibular ramus height can be used for sexual determination in case of unidentified body in any mass disaster and which can help in figuring out the person's identity.

2. Materials and method

Study setting- The present study was conducted in the department of Forensic Odontology using radiographs randomly from the database. Samples were collected from the department of oral medicine and radiology, Saveetha dental college and hospital.

Sample size: Total number of the samples collected were 60 out of which 30 were male and 30 were female. The age groups which were included were 21-30, 31-40 and 41-50.

Inclusion criteria: Ideal orthopantomography of patients with complete dentition were considered.

The measurement of the ramus was made from the point which is most superior on the mandibular condyle to the most protruding part of the inferior ramus border which is the tubercle.

Exclusion criteria: Panoramic radiographs showing fractures, pathologies and disturbances in the development of the mandible and edentulous mandible were excluded from the study.

Descriptive statistics: Software used was Planmeca for recording the data from the orthopantomogram. From where the data was transferred to SPSS software for further results.

3. Results

The results obtained for the age group of 21-30 for the females is 66.5600 ± 4.7 and for the males is 78.0300 ± 6.3 .

For the age group of 31 to 40 for female the mean value is 66.0200 ± 5.6 and for the males the mean value is 76.0200 ± 7.8

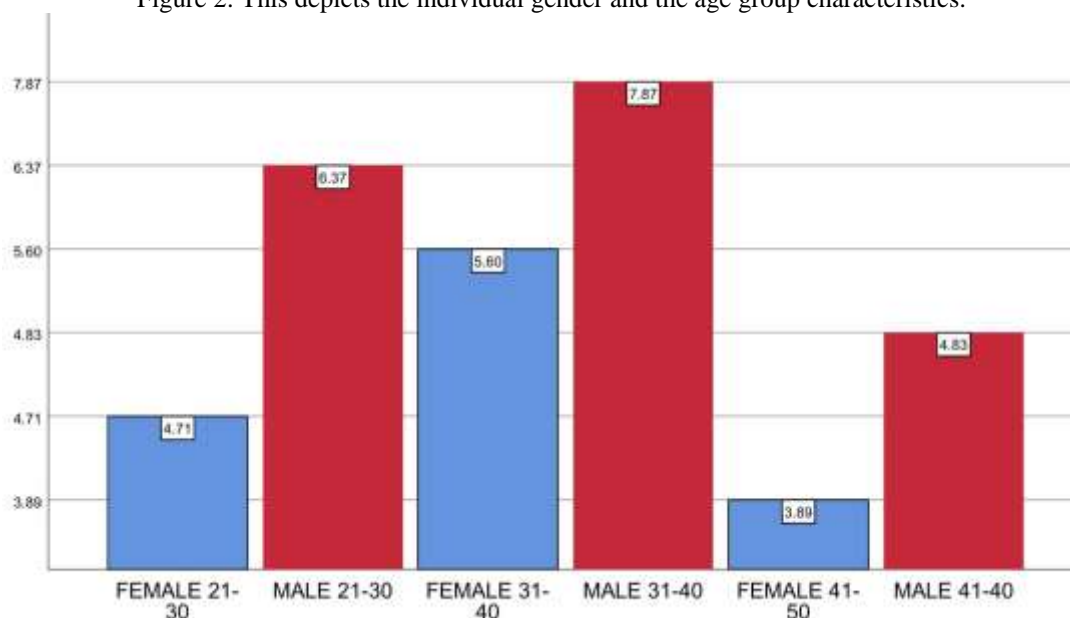
For the age group of 41 to 50 for female the value is 68.5500 ± 3.8 and for the male it is 73.4400 ± 4.8

Figure 1: This shows the descriptive statistical analysis between the different age groups and gender.

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00001	10	60.70	75.20	66.5600	4.71927
VAR00002	10	68.20	89.20	78.0300	6.37095
VAR00003	10	58.50	76.50	66.0200	5.60809
VAR00004	10	66.60	94.30	76.0200	7.87342
VAR00005	10	59.90	73.60	68.5500	3.89052
VAR00006	10	64.90	80.10	73.4400	4.83395
Valid N (listwise)	10				

Where Age group 21 to 30 are Variable 1(females) and Variable 2 (males)
 Age group 31 to 40 are Variable 3(females) and Variable 4 (males)
 Age group 41 to 50 are Variable 5(females) and Variable 6 (males)

Figure 2: This depicts the individual gender and the age group characteristics.



4. Discussion

According to ²⁷ Sex determination in case of mass disasters when the skeletal remains²⁸ is found in different forms becomes a great deal in itself^{29,30}. The identification can be aided by using the differences between the genders^{31,32}, like the orbits³³ being squarish with round margins in males and roundish with sharp margins in females. ³⁴ has also shown the association between the parameters on Japanese skulls like maximum length, breadth, height, facial breadth, upper facial height etc. Mandible can be taken in sex determination as it has sexual dimorphic characters. Also it is the strongest, largest and movable part of the body³⁵. In most cases for gender determination pelvis and a

skull with a mandible is taken into consideration³⁶. Many studies have been made on mandibular ramus and the gonial angle in the forensic sciences^{36,37}. Panoramic radiographs are taken on a routine basis and are considered as an appropriate method for screening tools for ruling out diseases involving the oral cavity³⁸. Larger coverage, low exposure to radiation and time efficiency are the benefits³⁹. Linear and angular measurements on the mandible are already taken into consideration for the retrospective studies^{28,40}. The present study shows the association between the sex determination and right side of mandibular ramus height. Different values were analysed using the SPSS gave the result and showed that males had greater mean value than the females. Also the result

is insignificant which could be because of the small sample size (30 males and 30 females) and the radiographs taken pertain to one particular population as they are the patients who approach Saveetha dental college.

5. Conclusion

In this study mean values for males of all the three age groups are more as compared to females. There is no significant association of sex determination using right side of mandibular ramus height with the values calculated on the basis of descriptive statistics.

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Conflict of Interest :

The authors hereby declare that there is no conflict of interest in this study.

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