THE FUTURE OF ANATOMY
Clinical Anatomy
Biomolecular and Cellular Anatomy
Anatomy in Radiology and Imaging

GrahaBIK-IPTEKDOK
Faculty of Medicine of Airlangga University
Surabaya, 22nd-23rd July 2011
Indonesia
THE DIFFERENCES BETWEEN MALE AND FEMALE SKULLS IN SEVERAL ANTHROPOMETRIC MEASUREMENTS

Setianingsih, H. ¹ dan Artaria, M. D. ²

¹The Department of Anatomy and Histology, Hang Tuah University, Surabaya, Indonesia
²The Department of Anthropology, Airlangga University, Surabaya, Indonesia
Email: dr.arfanayya@gmail.com

ABSTRACT

Introduction: The determination of sex is one of important issues in identifying missing persons, in forensics cases. So far, the determination of sex is accurate through observations of several parts of neurocranium and splanchnocranium—such as arcus superciliaris, temporal bossing, processus mastoideus, gonion angle, protuberantia occipitalis externa, shape of orbita, the upper edge of orbita, and protuberantia mentalis. Objective: This research tried to find other variables that might be able to differentiate the sex, so that it can aid the sexing in incomplete skulls. Methods and material: The materials of this research were the collection of the Department of Anatomy, and the Department of Anthropology, Universitas Airlangga, and Hang Tuah University in Surabaya. The sample were consisted of 52 males and 40 females skulls from Indonesia. The variables were al-al, enm-enm, ol-sta, the largest breadth of arcus zygomaticus. Results: The results showed that the largest breadth of arcus zygomaticus significantly differed males from females skulls. Conclusion: It can be concluded that the difference between males and females involved many features at human skull. It opens to many possibilities to find other features that can help in differentiating between male and female skulls.

Keywords: anthropometry, cranium, arcus zygomaticus, zygomatic arc, sexing, endomolar

INTRODUCTION

In anthropology men and women have different body sizes, such as height and weight, males have a height and weight are relatively larger than females, but there are other differences in the size of the body, including bone size, both male male and women. It is therefore interesting to know the differences in body size of human life, as well as the bones of the skull. In addition to the discovery of the nature and size of bone, will make it easier to describe the bone either male or female, so it will give good contribution in the science of forensic medicine. Bones can also provide information about race, gender and age. It has been known that there are differences between the sexes on the splanchnocranium arcus superciliaris, processus mastoid, gonion angle, protuberantia occipitalis externa, shape of the orbit, and the top edge of the orbit bone.

Parsons and Keene found sexual differences in several skull measurements in English skulls. Identification of 90% of the sexes can be done simply by using the pelvic bone, 80% only with the skull, and 98% by using both pelvic and skull. This study aims to find the measures of other variables that can be used to distinguish the sex of male and female on their skulls.

MATERIALS AND METHODS

Measurements were made on the bones of collections of The Department of Anatomy and Histology laboratory at the University of Airlangga, and Hang Tuah University. The sample were consisted of 52 males and 40 females skulls from Indonesia. The variables were al-al, enm-enm, ol-sta, the largest breadth of arcus zygomaticus.

RESULTS AND DISCUSSION

The results showed that the largest breadth of arcus zygomaticus significantly differed males from females skulls.
The skull is a complex structure. Frontal and parietal bones are purely membranous.\(^{[2]}\) At birth, the human skull is made up of 44 separate bony elements. As growth occurs, many of these bony elements gradually fuse together into solid bone. The five sutures are the two squamous, one coronal, one lambdoid, and one sagittal sutures. The growth of males is generally longer than that of females, thus the differences of shape of the skulls between the sexes.

In early life, the differences between male and females skulls are very little, but as they grow into adulthood the male skulls tend to be more robust and bigger than female skulls. Compared to the male skulls, the female skulls are smaller and lighter, and have 10 percent less of cranial capacity than that of male skulls.\(^{[3]}\)

The body of males is bigger than that of females. Therefore the larger size of the male skull. However, proportionally the male skull is about the same size as the female skull. Male skulls generally have more prominent temporal lines, more prominent supraorbital ridges, and a more prominent glabella. Female skulls generally have narrower jaws and rounder orbits. Male skulls usually have squarer orbits, larger sinuses, larger, broader palates, larger mastoid processes and larger occipital condyles than those of females. Male mandibles generally have thicker, rougher muscle attachments and squarer chins than female mandibles. Now we may conclude that there is another characteristic that can differentiate the males from the females, that is the breadth of the processus zygomaticus—which is significantly broader in males than those of females.

Those differences between males and females skulls may as well reflect the specific anatomical function such as chewing, or supporting the bigger size skull of males. In seals, certain adult skull growth features such as enhanced tympanic bullae surface area extension and occipital bone density are significantly different between the males and females. According to Mo et al.\(^{[4]}\), it might be related to specific anatomical functions.

CONCLUSION

It can be concluded that the difference between males and females involved many features at human skull, one of them is the breadth of arcus zygomaticus. It opens to many possibilities to find other features that can help in differentiating between male and female skulls.

REFERENCES