



VARIATIONS IN BRAIN VOLUME WITH BODY HEIGHT IN MALE MEDICAL STUDENTS

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ABSTRACT

Craniofacial anthropometry which is used in the determination of the morphological characteristics of the head and face is an important part of anthropology and medicine. The determination of ancestry or ethnicity (or race) is a troublesome question to anthropologist when facing identity of unknown individual. Assessing ancestry is much dependant on observer skill as they make use of traditional methods. Unlike traditional analysis, methods are also based on metrical assessment through morphological features. Anthropometric methods can show changes in craniofacial composition that diversify human phenotypes and particular features that differentiate individuals and ethnic groups. These standard data are accurately assessed which can be found useful in plastic surgery, tooth deformities, in legal medicine for identification of an individual or in medical genetics for the diagnosis of dimorphism or craniofacial abnormalities. Craniometry is a branch of anthropometry through which cranial dimensions can be estimated. The most important of Craniometric dimensions are height and width of the head that are used in cephalic index determination. **MATERIAL & METHOD-** Undergraduate 204 male medical students of JLN Medical College, Ajmer were screened and anthropometric data was taken for the study. **RESULT-** In this study there is a positive correlation between body height, $W \times H \times L$ and Cranial Capacity. **CONCLUSION-** The study revealed that taller male subjects have significantly higher values of head length, width and auricular height

KEYWORDS : Anthropometry, Craniometry CC- Cranial capacity

INTRODUCTION- Anthropometry, the typical and traditional tool of physical anthropology provides the scientific methods and the techniques for estimating the various measurements and the observations on the living as well as the skeleton of man. Cranial dimensions are not stable during earlier years of life due to further development such as the closure of anterior and posterior fontanelle but are stable overtime (between 20-80 years). Cranial dimensions of newborns are not stable because Cranial length, height and width increases as the growth progresses.¹

Material & Method- The present study is undertaken to find out the brain volume in male medical students of J.L.N. Medical College Ajmer (Rajasthan) Total of 204 cases were taken.

Parameters- Stature of subject has been taken by standing vertically on ground with head placing in Frankfurts horizontal plane. Frankfurt's plane is the plane of orientation obtained by joining the infraorbital margin to the upper margin of external acoustic meatus.

Head length- Two craniometric points from glabella to inion. Glabella- It is the median elevation connecting the two superciliary arches, and corresponds to elevation between the eyebrows.

Inion- It is the tip of protuberance on the posterior surface of occipital bone in the mid sagittal plane.

Head width- measured between two parietal eminences.

Head height- it measures the distance between trignon and highest point of head i.e. Vertex. Trignon is the point on the upper margin of tragus where tangents drawn to the anterior and upper margin.

Brain volume is calculated using the following formula by Lee-Pearson.

In males: $0.000337 \times (\text{Head length}-11) \times (\text{head breadth}-11) \times (\text{auricular height}-11) + 406.01$.

The present study is proposed to find out the correlation between stature and head dimensions (head length, head width and auricular height)

RESULT- Cranial capacity is one of the indicators to estimate brain volume. An increase of cranial capacity resulted in increase in body height. It may be perhaps helpful in medicolegal and anthropological examination to find the relations between cranial capacity and height.

DISCUSSION

The evaluation and measurement of human body dimensions and diameters may be achieved by physical anthropometry.^(2,3) Anthropometric measurements are also important for the assessment of health status. An important part of anthropometry is represented by craniofacial measurements for the determination of head and face shapes.⁽⁴⁾ Estimated cranial volume can be obtained either from the cadaver or human. Several methods were reported in previous literatures, including by imaging i.e. magnetic resonance imaging (MRI), computed tomography (CT) scan and by craniometry. Craniometry is a branch of anthropometry through which cranial dimensions can be estimated.⁽⁵⁾ Cranial capacity is a measure of the volume of the interior of the cranium (skull) of those vertebrates who have both a cranium and a brain.⁽⁶⁾ The cranial capacity is used as a rough indicator of the brain size and this in turn is used as a rough indicator of the potential intelligence of the organism.

SUMMARY & CONCLUSION: Body measurements are used for calculation of BMI and also head measurements such as length, width and height can be used to calculate the skull volume. Cranial Capacity is one of the indicators to estimate brain volume. An increase of cranial capacity resulted in increase of the body height, body weight and BMI.

REFERENCES:

1. Relative growth of human fetal skull in width, length and height 36 (6): 451-6 Michael J. Trenouth.
2. Chamella M., 1997: Biological Anthropology. Tehran Gostar, Tehran. 75
3. Williams PL., Dyson M., Dussak J.E., Bannister L.H., Berry M. M., Collins P, Ferguson M. W.J., 1995: Skeletal system. In: Gray's Anatomy. 38th Edition. Pp. 607- 612. ELBS eith Churchill Livingstone, Edinburgh, London.
4. Goldipour M.J., Heydari K., 2004: Effect of the ethnic factor on cranial

- capacity and brain weight of male newborns in northern Iran. *Neuroembryology and Aging* 3: 146-148
5. Laeeque M, Nirmale VK, Diwan CV. Derivation of Demarcating Points for Sex Determination from Skull. *International Journal of Recent Trends in Science and Technology* 2013;6:56-9.
 6. Ezejindu DN, Chinweife KC, Ihentuge CJ, Uloleme GC. Studies of cranial capacity between the ages of 14-20 years of Ojidi people of Anambra State, Nigeria. *Journal of Dental and Medical Sciences*. 2013;8:54-9.