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Original Article

Determination of Stature from the Length of Head in Population of Rajasthan

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ABSTRACT

Estimation of stature from measurement of various body parts is of immense important to the forensic experts. It is known that there a close relationship exists between the height of an individual and various parts of the body like head, trunk, upper and lower extremities. The aim of this study is to estimate the relationship between the stature and head length. This study was conducted on 200 (100 males, 100 females) medical students of age groups 20-30 years at S.M.S. Medical College, Jaipur (Rajasthan). Stature and head length were measured by using stadiometer and spreading caliper respectively. The findings indicated significant correlation between stature and head length. Linear regression equation for predicting the stature using head length for both gender were: Y= 1.079X for males and Y= 1.098X for females.

KEYWORDS: Correlation coefficient, Head length, Regression equation, Stadiometer, Spreading caliper, Stature.

INTRODUCTION

Personal identification means determination of individuality of a person[1, 2]. Personal identification has always been of interest to anthropologists and for medico-legal purpose in forensic medicine. Age, sex and stature are the primary characteristics of identification of a person.[3-7] There is a definite relationship between the height of a person and various parts of the body like head, trunk and lengths of the upper and lower limbs. Each worker has derived his own formula for calculating the stature from pelvis, head dimensions and various long bones, which differ according to race, age and sex.

In the present study, an attempt has been made to derive regression equation to indicate relationship between stature and head length in males and females.

MATERIALS AND METHODS

This study was conducted on 200 medical students at S.M.S. Medical College, Jaipur, Rajasthan of different socio-economic status. All the subjects were between the age groups of 20-30 years. Students with any craniofacial deformities were excluded. Maximum head length was measured from glabella (point above nasal root and between the eye brow ridges intersected by mid- sagittal plane) to inion (tip of external occipital protuberance) by using spreading caliper. Stature is measured by vertical distance from vertex to floor of baseboard of stadiometer. All data were entered on MS excel sheet and analyzed by using student't' test. Correlation coefficient and formula derived for regression equation to estimate the approximate height from stature.

OBSERVATIONS AND RESULTS

The mean age of the study subjects (males: 21.98± 1.76; females: 22.49± 2.149) were not significantly different between genders.

Mean height of males was found 171.858± 6.3548 cm and of females was found 158.07± 5.8035 cm. Gender difference shows significantly higher stature in males compared to females (Table 1).

Gender difference with respect to the mean cranial length was found to be significantly larger in males compared to the females (Table 2). The regression analysis was carried out to find the relationship between the stature and head length. Correlation between the head length and the stature was examined by using Pearson's correlation coefficient according to the gender. Correlation coefficient of stature and head length in males was found 0.309 and in females 0.31 (Table 3). So correlation coefficient between stature and head length was found to be statistically significant and positive in both males and females.

Regression equation developed for the stature estimation from the head length was:

For male: Y= 1.079X
For female: Y= 1.098X

Table 1: Comparison of stature (cm) of the study subjects.

Sex	N	Mean Stature	Std. deviation	P value
Male	100	171.858	6.3548	< 0.001 S
Female	100	158.07	5.8035	

S: Significant.

Table 2: Comparison of head length between male and female.

HEAD LENGTH(mm)				
Sex	**N**	**Mean head length**	**Std. deviation**	**P value**
Male	100	185.740	9.4142	
Female	100	173.830	7.98	< 0.001 S

S: Significant.

Table no.3 Correlation coefficient between stature and head length.

Parameter (with stature)	Male	Female
Head length(mm)	0.309	0.31

DISCUSSION

The present study was an attempt to estimate correlation between stature and head length in adult Rajasthan population. In this study approximate stature has been estimated from head length and a regression equation formula is derived. There is distinct sexual dimorphism in the stature and head length in present study group.

Table 4. Shows values of Stature of both sexes by various authors.

S.No	Reference	Population	Males (in cm)	Females (in cm)
1.	**Patil & Mody**	Central Indian population	164.78	150.55
2.	**Ryan& Bidmos**	Indigenous South Africans	153.27	143.08
3.	**Kalia et al**	Mysorean patients	171.65	155.67
4.	**Ilayperuma**	Shri lankans	162.95	152.48
5.	**Sahni et al**	North west Indians	165.90	163.24
6.	**Agnihotri et al**	Indo-Mauritian population	173.40	157.36
7.	**Asha & Prabha**	South Indian population	169.62	156.82
8.	**Wankhede et al**	Medical students of Nagpur	170.97	156.89
9.	**Giurazza et al**	Caucasians of Rome	167	156
10.	**Mukesh Kumar et al**	Haryanvi adults	168.71	155.18
11.	**Laxmi N. C**	Gujarat	171.18	159.09
12.	**Kolte and Bansal**	Marathwada	165.7	147.7
13.	**Chourasia RS**	Indore	170.905 ± 11.339	153.374 ± 20.544
14.	**Sumita Agarwal**	North India	169.45±6.04	156.93±5.05
15.	**Present study**	Medical students of Jaipur	171.858± 6.3548	158.070± 5.8035

Table 5. Shows comparison of mean Head length in both sexes by various authors.

S.No.	Author	Population	Year	Head length	
				M	F
1.	**Isurani ilayperuma**	Sri Lankan	2010	180.00±11.12	171.92±10.11
2.	**Vineet Kumar et al**	Madhya Pradesh	2010	191.270±6.903	178.720±5.577
3.	**Sheetal Sagar**	Delhi	2014	187.0± 1.2	179± 9.2
4.	**Anjali Prasad et al**	Maharashtra	2014	197.6 ± 15.7	182.8 ± 11.3
5.	**Sumita agarwal**	North India	2014	182.4±6.4	173.9±6.2
6.	**Chourasia RS**	Indore	2014	184.20 ± 12.72	172.60 ± 5.97
7.	**Present study**	Rajasthan	2015	185.740±9.4142	173.830±7.98

Table 6. Showed correlation coefficient between stature and head length.

S.No.	Reference	Population	Correlation coefficient	
			M	F
1.	Saxena	Uttar Pradesh	0.204	-
2.	Isurani Ilayperuma	Shri Lankan	0.715	0.470
3..	Jadav HR	Gujarat	0.53	-
4.	Seema, Mahajan A.	Punjab	0.52	-
5.	Anjali Prasad et al	Maharashtra	0.26	0.22
6.	Sumita Agarwal	North India	0.215	0.341
7.	Chourasia RS	Indore	0.241	0.173
8.	Present study	Rajasthan	0.309	0.31

CONCLUSION

With respect to age, sex and racial groups, dimensions and body proportions are widely variable. In this study significant sexual difference is observed in stature. In males the mean stature observed was 171.858 ± 6.3548 and in females 158.070± 5.8035. Correlation coefficient of head length with stature is 0.309 for males and 0.31 for females.

REFERENCES

1. Mahesh Kumar, Patnaik V V Gopichand. The Anthropometric Variation among Haryanvi populations. IJSR 2013, 2(6).
2. Anjali Prasad, .V B Bhagwat, Estimation of stature from head length in living adults in marathwada region of Maharashtra. Int J of Recent Scientific Research. 2014; 10(5); 1745-1748.
3. Jadav HR, Shah GV. Determination of personal height from the length of head in Gujarat region. Journal of Anatomical Society of India.2004; 53(1): 20-21.
4. IIayperuma I. On prediction of personal stature from cranial dimensions. Int. J. Morphol. 2010, 28(4):1135-40.
5. Seema and Mahajan A: Estimation of personal height from the length of head in Punjab zone. International J of plant, animal and environmental sciences. 2011:1(3), 205-8.
6. Sonali Khanapurkar, Ashish Radke, Estimation of stature from the measurement of foot length, hand length and head length in Maharashtra region. Ind J of Basic & applied Med. Research. 2012, 2(1): 77-85.
7. Sheetal Sagar and Surinder Nath, Estimation of stature from different head and face measurements among male and female Jatavs of Delhi. IOSR – J of Hum and Social Science.2014, 9(19): 52-55.
8. Sunil et al. Estimation of stature From Hand length. JIAFM, 2005: 27(4).

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