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Cephalic and Facial Indices among Adult Females of Kurseong

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Abstract

The present cross-sectional study in Kurseong of Darjeeling district, West Bengal, India was conducted among adult Nepali speaking Hindu females, aged 18 to 46 years. The aim of the study was to find out the cephalic and facial index of adult Nepali females. All measurements were taken by using standard techniques. The mean age was 35.56 (SD 8.56) years. It was observed that Mesocephal form was the dominant head type and Mesoprosop was the dominant face type among the studied population.

Keywords: Cephalic index; Facial index; Nepali, Female.

Introduction

Cephalofacial measurement played an important role in personal identification and population variation (Shah et al., 2015). Facial and cephalic indices were widely used in physical anthropology to understand the relationship between different racial groups as well as in understanding human evolution (Goldstein et al., 1936; Moores et al., 1999; Li et al., 2012), because head and face characteristics are more affected by genetic than environmental factors (Li et al., 2013).Craniofacial anthropometrics have become an important tool for genetic counselors to identify any dysmorphic syndromes (Nagle et al., 2005). A study by Rosati and Guariglia (2003) demonstrated that three out of four foetus with trisomy 13 had hypotelorism and thus ocular biometric parameters becomes an useful sonographic markers for trisomy 13. Study also demonstrated that individuals with psychotic disorder had skulls that were more brachycephalic (McGrath et al., 2002) compared to normal. The cranial measurements were also useful in phenotyping and identifying population subsets with obstructive sleep apnea as study revealed that brachycephalic was associated with an increased apnea hypopnea index (Cakirer et al., 2001). It was also reported that individual with Alpert's syndrome are hyper brachycephalic (Cohen and Kreiborg, 1994).

Thus human cephalometrics has always been an interesting subject for pediatrics, anthropologists, anatomist, forensic medicine, plastic surgery and oral surgery dentistry (Golalipour, 2006; Kataria et al., 2015). However, very few attempts have been made in India to understand the cephalo facial characteristics (Shema et. al., 2014; Shah et. al., 2015), especially in eastern India. In view of the above the present study was undertaken to find out the cephalic and facial index of adult Nepali females in Kurseong of Darjeeling district.

Materials and Methods

The present study was carried out in Kurseong of Darjeeling district, West Bengal, India. It was carried out among randomly selected adult Nepali speaking Hindu females. A total of one hundred and eight females were incorporated in the present study. Participants included in the present were apparently healthy and without any craniofacial deformity. Prior informed consent was obtained from each subject. The age range of the participant was between 18 to 46 years. Data on bio-social information including age, education and occupation were collected by scheduled. Four anthropometric measurements namely maximum head length (MHL), maximum head breadth (MHB), morphological facial length (MFL) and bi-zygomatic breadth (BZB) were taken following standard anthropometric procedure (Mukherji et al., 2009).

MHL is the linear distance between glabella and opisthocranion in the median plane. MHB is the linear distance between the two euryons. MFL is the linear distance between from nasion to gnathion and BZB is the linear distance between two zygia. All breadth measurements were measured using Martin's sliding caliper and length measurement was taken using Martin's spreading caliper to the nearest 0.01 cm. Following indices were derived and categorised following Mukherjee et al. (2009).

Length-Breadth Index (Cephalic Index) = (MHB x 100)/ MHL

Table 1: Classification of Cephalic index

Category	Range
Hyperdolichocephal	X – 71.9
Dolichocephal	72.0 – 76.9
Mesocephal	77.0 – 81.9
Brachycephal	82.0 – 86.4
Hyperbrachycephal	86.5 – 91.9
Ultrabrachycephal	≥92.0

Morphological Facial Index (Facial Index) = (MFL x 100)/BZB

Table 2: Classification of Facial index

Category	Range
Hypereuryprosop	X – 76.9
Euryprosop	77.0 – 81.9
Mesoprosop	82.0 – 85.9
Leptoprosop	86.0 – 90.9
Hyperleptoprosop	≥91.0

Table 3: Characteristics of the studied population

Variables	Mean	SD	SE	Range	
				Max	Min
MHL (cm)	17.56	0.63	0.06	19	16
MHB (cm)	14.28	0.76	0.07	19.3	12.5
MFL (cm)	10.46	0.59	0.05	11.9	9
BZB (cm)	12.80	0.81	0.07	17.4	11.3

SD = standard deviation, SE = standard error, Max = maximum, Min = minimum, MHL = Maximum head length, MHB = Maximum head breadth, MFL = Morphological facial length.

Table 4: Classification of head andface form

Variables	Types	N (%)
Head type	Hyper dolichocephal	2 (1.85%)
	Dolichocephal	15 (13.88%)
	Mesocephal	44 (40.74%)
	Brachycephal	34 (31.48%)
	Hyper brachycephal	11 (10.18%)
	Ultra brachycephal	2 (1.85%)
Face type	Hypereuryprosop	22 (20.37%)
	Euryprosop	26 (24.07%)
	Mesoprosop	38 (35.18%)
	Leptoprosop	17 (15.74%)
	Hyperleptoprosop	5 (4.62%)

Data were subjected to statistical analysis for determining mean, standard deviation (SD) frequency distribution, standard error (SE) and range.

Results and Discussion

The mean age of the studied population was 35.56 (SD 8.56) years. Descriptive statistics of anthropometric measurements are presented in table 3. Table 4 shows the classification of cephalic index and facial indexof the studied population. It shows that dominated head type is mesocephalic (40.74%) followed by brachycephal (31.48%), dolichocephal (13.88%), hyperbrachycephal (10.18%), hyperdolichocephal (1.85%) and ultrabrachycephal (1.85%). On the other hand dominated face type of the studied population is mesoprosop (35.18%) followed by euryprosop (24.07%), hypereuryprosop (20.37%), leptoprosop (15.74%) and hyperleptoprosop (4.62%).

The present study among natives female of Kurseong revealed mesocephal and mesoprosop was the dominant head and face type respectively. In a recent study Lakshmi et al. (2015) also demonstrated mesocephal as dominant head forms among adults of both sexes in Visakhapatnam. Higher prevalence of mesocephal head forms

was also observed in central Indian study (Shema et. al., 2014). A similar result was also observed by Shah and Jadhav (2004). However, in a previous study among Gujrati population Mehta et. al. (2014)revealed that 64% of people are leptoprosopic to hyperleptoprosopic. A comparative study (Shah et. al., 2015) between Gujarati and non-Gujarati population also showed higher prevalence of mesocephalic head form among Gujarati population, on the other hand the prevalence of dolicocephalic head form was higher among non-Gujarati population. Interestingly, in both populations hypereuryprosopic was the predominant face types (Shah et. al., 2015). Contrary to that, the dominant head form among Bhils was dolichocephal (Bhargava and Kher, 1960). Yagain et. al. (2012) in a study among adult female demonstrated brachycephalic as a dominant head form with a prevalence of 33%. Mesocephalic head form was also dominant among sickle cell anemia patients (Kate, 1977). In accordance with the present study Barelas population of central India also had mesocephal as the dominant head form (Bhargava and Kher, 1961). A North Indian study also showed mesoprosopic as the dominant type of face shape with a prevalence of 47% and 45% respectively in male and female (Kataria et. al., 2015). Comparison of face shape between Jat Sikhs and Bania of Punjab demonstrated that the dominant type of face shape among Jat Sikhs males was euryprosopic whereas hypereuryprosopic was dominant in Bania males (Singla et. al., 2011). Kumar and Lone, (2013) demonstrated mesoproscopic as the dominant face shape among Harayanvi adults. Study among the Onges tribe of Andaman Nicobar Islands revealed higher prevalence of brachycephalic head form and hypereuryproscopic face form both in male and female (Pandey, 2006). Study in Kosovo – Albanian population showed brachycephalic head form and hyperleptoprosopic face form were dominated (Staka et al., 2013). Comparative study among Malaya, Chinese and Indian adults in Malaysia revealed hyperleptoprosop as the dominant face form irrespective of ethnic differences (Jeyaseelann et. al., 2016).

In conclusion, adult Nepali females of Kurseong were mostly mesocephal and mesoprosop with regards to their head and face form. However, further study should be conducted on other ethnic groups in India for understanding ethnic diversity. Moreover, data obtained from such studies could be useful in cosmetology, orthodontist, plastic surgeries, anatomy, physical anthropology, genetic counselling and in forensic science.

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