

# DETERMINATION OF ANATOMICAL TYPE OF HEAD AND FACE IN CHILDREN UNDER 6 YEARS IN AHWAZ

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**Abstract-** Cephalometry is an important branch of anthropology in which the dimensions of head and face can be determined. These dimensions are used to show indexes for studying brain growth and formation of all types of head and face. Indexes are vary from 65 to 95 for head and 65 to 105 for face, which are used to determine 4 international anatomic types of head and 5 international anatomic types of face. The present study was carried out to determine all types of head and face among subjects aged less than 6 years. A total of 267(145 male and 131 female) children were enrolled in this study. Convenience sampling was collected from kindergarten and preschool children. The subjects categorized to 1, 2, 3, 4, 5, 6 months and 11 groups of 12-72 months. Appropriate equipments were used for measuring height and width of the head and face. The results of this study indicated that brachycephalic (38%) was the most common anatomical type of head, euryprosopic (38.6%) and hyperleptoprosopic type (4.5%) for face.

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*Acta Medica Iranica*, 45(1): 43-45; 2007

**Key words:** Anthropology, cephalometry, cephalic index, head, face

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## INTRODUCTION

Cephalometry is one of the important branches of anthropology in which the dimensions of head and face can be determined. These dimensions are used to show indexes for studying brain growth and formation of all types of face. It is also known that the formation of face accompanies with the growth of brain, paranasal sinuses and teeth (1, 2). Genetic and environmental factors may contribute to the formation of craniofacial characteristics (3), and in infancy prior to cranial sutures and fontanel calcification, the craniofacial skeleton can easily deformed by externally exerted forces (4).

The head indexes are calculated from the maximum length derived by the maximum width multiply 100. The same calculation addressed for the face. These values will be vary from 65 to 95 for head and 65 to 105 for face. Consequently the above indexes of head are composed from 4 international anatomic categories: hyperbrachycephalic, brachycephalic, mesocephalic and dolichocephalic. The face indexes are also divided to in 5 international anatomic categories: hypereuryprosopic, hyperleotoprosopic, leptoprosopic, mesoprosopic and euryprosopic (5, 6).

During the first 6 years of life, the brain growth, development of paranasal air sinuses, and growth of temporary teeth after birth, have a significant impact on formation of anatomic types of head and face. Determination of different anatomic types of head and face has not been studied in South-west of Iran.

This study aimed to measure the width and length of the head and face, which these values are studied to calculate the anthropologic indexes.

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Received: 24 Jul. 2004, Revised: 4 Mar. 2006, Accepted: 15 May 2006

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## MATERIALS AND METHODS

Samples were collected randomly from kindergarten and preschool children under 6 years of age of both sexes. Samples with congenital malformation, history of head and face operations, born by Cesarean's and mental retardation were excluded from the study and finally, 276 normal children (145 males and 131 females) were entered the study for determination of anatomic types of head and face. We obtained informed consent from parents of all participants.

Appropriate equipments such as anthropometer, calliper cephalometer, goniometer, measuring tape, and caliper were used for measuring of height and width of the head and face. For maximum cranial breadth, maximum distance between two parietal bones, and for maximum cranial length, distance between frontal tuberosity and inion have been measured. Distance between two zygomatic arches measured for bizygomatic breadth and distance between gnathion and nasion measured for facial length. For calculation of cephalic index, maximum cranial breadth/maximum cranial length multiplied by 100 and for facial index, facial length/bizygomatic breadth multiplied by 100 were used.

All the above data have been processed using the software of SPSS for windows (version 10.0) and statistical method of Chi Square test was employed.  $P < 0.05$  was considered significant.

## RESULTS

The most frequent anatomical types of head were brachycephalic (36.7%), mesocephalic (32.2%), hyperbrachycephalic (27.8%) and dolichocephalic (3.3%). There were no significant differences in anatomical types of head by sex ( $P > 0.05$ ).

Frequency of different anatomical types of head and face in male and female are shown in tables 1 and 2 respectively. The top three anatomical type of face were euryprosopic (38.6%), mesoprosopic (27.2%) and hyperleptoprosopic (19.4%). In anatomical types of face no significant differences observed between male and female ( $P > 0.05$ ).

**Table 1.** Frequency of anatomical types of head in children under 6 years of age, Ahwaz\*

Anatomical type	Male	Female	Total	P value
Brachycephalic	34.1	39.7	36.7	0.45
Mesocephalic	31.8	32.8	32.2	0.59
Hyperbrachycephalic	31	24.1	27.8	0.3
Dolichocephalic	3.1	3.4	3.3	0.56

\* Data are given as percent.

## DISCUSSION

The results of this study indicated that brachycephalic type of head was the most and dolichocephalic type was the least common in children of Ahwaz, a city in South-western part of Iran. No significant differences were observed between different anatomical types of head and sex. The results of this study was the same as studies carried out in South-east of Caspian sea (Gorgan), Fars and Torkaman children (6) in Tehran (7), and study of cephalometry in 274 children aging from 7-10 years in East of Tehran (8). In all above mentioned studies brachycephalic type of head was dominant and dolichocephalic type was the least common. Although Hung in 1995 mentioned that supine sleep position may promote brachycephaly and prone sleep position cause dolichocephaly (4). Bharati indicated that in tropical zone dolichocephalic and in temperate zone brachycephalic head were dominant forms respectively (9). The results of the present study are match with temperate zone forms and brachycephalic head forms were more than other forms. In Karanth study in Tibetan population (10), the frequency of euryprosopic face and brachycephalic head were higher and similar to our findings. Meanwhile, according to the present investigation it is concluded that brachycephalic type

**Table 2.** Frequency anatomical type of face in Ahwaz children under 6 years\*

Anatomical type	Male	Female	Total	P value
Euryprosopic	34.4	42.9	38.6	0.35
Mesoprosopic	25.8	28.6	27.2	0.28
Hypereuryprosopic	22.7	16.1	19.4	0.22
Leptoprosopic	13.3	8	10.6	0.2
Hyperleptoprosopic	3.9	4.5	4.2	0.49

\*Data are given as percent.

of head was more frequent and dolichocephalic type was rare and for face euryprosopic (wide face) in male and female was dominant and hyperbrachycephalic type was rare in Ahwaz, and it is suggested that more studies should be done in different region in Iran according to the sex, age, race, culture and environmental parameters.

### **Conflict of interests**

We have no conflict of interests.

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