The Shapes Of Head And Face In Normal Male Newborns In South-East Of Caspian Sea (Iran-Gorgan)

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Abstract. — Anthropometric dimensions are basis for evaluation of health of newborns. This study is conducted in view of the importance of anthropometric indices of head and face in forensic medicine, surgery, pediatrics, and medical imaging. This descriptive and cross-sectional study is undertaken on 420 normal one-day old newborns to determine range of their head and face dimensions in Fars and Turkman races (Turkman group : n = 217, Fars group : n = 203). Means and SD of cephalic and prosopic indices in Fars group were 77.97 ± 5.347, 72.95 ± 11.21 and in Turkman group were 77.00 ± 5.21, 80.93 ± 9.73 respectively. Dominant and rare types of head in Fars group were mesocephalic (36.5%) and hyperbrachycephalic (8.9%) and in Turkman group were mesocephalic (38.2%) and hyperbrachycephalic (7.4%) respectively. Dominant and rare types of faces in Fars group were hypereuriprosopic (71.9%) and hyperleptoprosopic (2.5%) and in Turkman group were hypereuriprosopic (34.6%) and hyperleptoprosopic (0.9%) respectively. This study determines the possible effects of racial factor on the diversity of face shape in normal male newborns.

Key words: — Craniofacial forms, Caphalometry, Cephalic index, Prosopic index, Race, Male.

Introduction:

The evaluation and measurement of human body dimensions are achieved by physical anthropometry (Chamella, 1997; Williams et al, 1995). The human body dimensions are affected by ecological, biological, geographical, racial, gender and age factors (Mibodi & Frahani, 1996; Okupe et al, 1984; Toil et al, 1995).

On the basis of above factors, anthropometric studies are conducted on the age, sex and racial groups in certain geographical zones (Williams et al, 1995; Afak and Turgut, 1998). On the other hand, dimensions of newborn’s body can be basis for all changes in anthropometric indices. Therefore, these dimensions are important in this field, because this is one of the newborn’s health evaluation indices (Golalipour et al, 2000; Azizi, 1993; Afak and Turgut, 1998). Cephalometry is one of the important parts of anthropometry in which dimensions of head and face are measured. Cephalometric results are used in pediatrics, forensic medicine, plastic surgery, oral surgery and diagnostic comprehension between patient and normal populations (Williams et al, 1995).

Although, anthropometric studies of newborns, other age groups, and its relationship between health and disease have been performed but there is a scope for research in various geographical and racial groups. Inspite of determination of some anthropometric features such as weight, height and circumference of head in this area (Golalipour et al, 2000) study on cephalometry has not been carried out. The present study was planned for determining normal range of head and face shapes in normal male newborns in native Fars and Turkman races.

Material and Method:

This study was done on 420 normal male newborns (Fars group n = 203; Turkman group, n = 217).

Turkman group: Turkman’s population are living for more than two centuries in this area, who immigrated from central Asia. Turkman people are only marrying in intra-group because of religious and ethnic beliefs. Thus, they are nearly pure race.

Native Fars group: populations of native Fars have been selected from amongst last three generations who lived in this zone.

All newborns were evaluated in 12-24 hours after birth. Head circumference of newborns were determined by tapes meter without elasticity (+ 1 mm <n). Other measurements, which were determined by Martin spreading caliper, were included:

- Head length = Summit of glabella to farthest occipital point.
- Head width = greatest breadth, at right angles to median plane.
The data for each newborn was recorded in a special form and then analyzed by EP16. For determining morphological indices in racial group we used Chi square test and for comparison of the means of anthropometric measurements T student test (a = 0.05) was used.

Results:

I. Means and SD of head length, width, and circumference; length and width of face and auricular height in Turkman and native Fars are depicted in table 1.

II. Indices: Means and SD of cephalic index in Turkman and Fars groups were 77.00 ± 5.91, 77.97 ± 5.34 respectively. There was no significant difference between two groups. Prosopic indices of two groups were 80.93 ± 9.73, 72.95 ± 11.21 respectively and there was significant difference between two groups (P < 0.00001).

III. Morphological classification of head (Table 2):

Head was classified by cephalic index, so that mesocephalic type with 38.2% was dominant and hyperbrachycephalic type with 7.40% was rare in Turkman’s male newborns. Dominant and rare types in native Fars were mesocephalic (36.5%) and hyperbrachycephalic (8.9%) respectively (table.2).

There was no significant difference between dominant and rare types in two racial groups.

Table. 1: Showing various parameters of head & face in Turkman & Fars male newborns

<table>
<thead>
<tr>
<th>Different Parameters</th>
<th>Turkman male newborn</th>
<th>Fars male newborn</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Head length</td>
<td>114.424</td>
<td>5.294</td>
<td>114.532</td>
</tr>
<tr>
<td>Head width</td>
<td>88.041</td>
<td>6.329</td>
<td>89.197</td>
</tr>
<tr>
<td>Face length</td>
<td>54.171</td>
<td>7.454</td>
<td>49.562</td>
</tr>
<tr>
<td>Face width</td>
<td>67.120</td>
<td>6.517</td>
<td>68.320</td>
</tr>
<tr>
<td>Auricular height</td>
<td>79.336</td>
<td>6.704</td>
<td>81.443</td>
</tr>
<tr>
<td>Circumference of head</td>
<td>349.977</td>
<td>14.857</td>
<td>351.064</td>
</tr>
</tbody>
</table>

Table 2: Distribution of head shapes in Turkman & Fars male newborns

<table>
<thead>
<tr>
<th>Head shapes</th>
<th>Turkman Race</th>
<th>Fars Race</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (Percent)</td>
<td>N (Percent)</td>
<td></td>
</tr>
<tr>
<td>Dolicocephal</td>
<td>73 (33.6)</td>
<td>58 (28.6)</td>
<td>0.3100</td>
</tr>
<tr>
<td>Mesocephal</td>
<td>83 (38.1)</td>
<td>74 (36.5)</td>
<td>0.7801</td>
</tr>
<tr>
<td>Brachycephal</td>
<td>45 (20.7)</td>
<td>53 (26.1)</td>
<td>0.2359</td>
</tr>
<tr>
<td>Hyperbrachycephal</td>
<td>16 (7.4)</td>
<td>18 (8.9)</td>
<td>0.7025</td>
</tr>
</tbody>
</table>

Table 3: Distribution of Face shapes in Turkman & Fars male newborns

<table>
<thead>
<tr>
<th>Face shapes</th>
<th>Turkman Race</th>
<th>Fars Race</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (Percent)</td>
<td>N (Percent)</td>
<td></td>
</tr>
<tr>
<td>Hypereuryprosopic</td>
<td>75 (34.6)</td>
<td>146 (71.9)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Euryprosopic</td>
<td>53 (2.4)</td>
<td>31 (15.3)</td>
<td>0.0263</td>
</tr>
<tr>
<td>Mesoprosopic</td>
<td>62 (28.6)</td>
<td>12 (5.9)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Leptoprosopic</td>
<td>25 (11.5)</td>
<td>9 (4.4)</td>
<td>0.0130</td>
</tr>
<tr>
<td>Hyperleptoprosopic</td>
<td>2 (0.9)</td>
<td>5 (2.5)</td>
<td>0.1981</td>
</tr>
</tbody>
</table>

IV. Morphological classification of the face:

- Hypereuryprosopic type (34.60%) and hyperleptoprosopic type (0.90%) were dominant and rare types in Turkman’s male newborns (table.3) and also dominant and rare types of faces in Fars’ male newborns were hypereuryprosopic (71.9%) and hyperleptoprosopic (2.5%) respectively (table.3).

Discussion:

In this research cephalic indices were 77.00 ± 5.211 and 77.97 ± 5.347 in Turkman and Fars races respectively. The cephalic indices of this study were lower than Jordaan’s study in South Africa (80.29 ± 0.89) (Jordaan, 1976) and India (88.4 ± 1.1) (Rajlakshmi et al, 2001) They resembled to Imami’s study in Quzvin-North-West in IRAN (87.5 ± 6.4) (Mibodi and Frahani, 1996).

Dominant type of head shape in both native Fars & Turkman group was mesocephalic (36.5% & 38.2% respectively). However, the types of head shape between two groups were somewhat diverse. Our results resembled Mibodi and Frahani, 1996 (40% mesocephalic). Dominant type of head didn’t resemble to Jordaan’s Study (Brachycephalic) in South Africa (Jordaan, 1976) and India (Tuli et al, 1995) (Dolicocephalic).

In respect to the variation of head shape in various races and geographical zones, we believe that hereditary factor primarily affects on the shape of head, however environment has secondary effect on it.

It must be remembered that the reaction to a given environment represents the interaction of the genotype of the population being studied with the environment (Jordaan, 1976).

The anthropological studies on basis of racial changes have determined that the people of Africa, India, Australia are central part of Europe and north of America and dolicocephalic type, head shape of people in pacific Ocean are brachycephalic type and in middle East, Russia and central parts of Europe are mesocephalic type and also the most of people in Atlantic Ocean border were mesocephalic type (Chamella, 1997).

Head shape is affected by factor of time as reported by Nakishima (1986) in Japan that head shape had changed during 30 years.

Prosopice indices in two groups didn’t resemble to Mibodi and Farahani, (1996). The dominant type...
of face shapes in Fars race was the same as their study and so was hypereuriprosopic in Turkmans. However, dominant type of face shape in Turkman group was hypereuriprosopic (34.6%), but percentage of diversity of faces in two groups were different because of possible effect of racial factor.

The prosopic was lower in children and was affected by time period (Chamella, 1997). Therefore, this study determines the possible effect of racial factor on the diversity of head and face shapes.

We suggest that the efforts are necessary for determining the role of environment, heredity, aging, and racial factors on the shapes of head and face.

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References:
