# Variability of Vertical and Horizontal Facial Measurements Among the Population of Basrah 

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#### Abstract

: BACKGROUND: Anthropometry is the systematic quantitative representation of the human body, it is used to measure the absolute and relative variability in size and shape of the human body. Scientists were studying this knowledge in medicine for both diagnosis and treatment. The people of Basrah are a mixture of Semites, Arian, and there are the mixed group result from interracial marriages.

\section*{OBJECTIVE:}

To quantitatively measure the human face in different ethnic groups of local population and to identify the differences between individuals of different races and sexes, also to identify the differences between the people of Iraq and other people worldwide.

\section*{MATERIAL AND METHODS:}

This study is a cross sectional study conducted in Basrah governorate. The data was randomly collected for the period from February to July 2013, from 1000 Iraqi adults ( 526 females and 474 males) living throughout Basrah governorate. They were between the ages of 18-40 years, and had to meet certain criteria. This sample was used to create a database for statistical analysis.

\section*{RESULTS:}

The results show that the measurements of the three sections and four sections facial profile are unequal as stated by neoclassical canons. The ears are longer than the nose. There are slight differences between the intercanthal distance (ICD) and alar width. The palpebral fissure length is equal to the ICD. The mouth width is 1.4 times the nose width. The facial width (zy-zy) is 3.4 times the nose (alae) width. CONCLUSION: There are differences in facial measurements, although slight, between different ethnic groups in Iraq, and between Iraqi population in general and the population of other countries, therefore, aesthetic measurements applied to all races are inapplicable. These slight differences could be attributed to interracial marriages and or environmental effect.


KEY WORDS: anthropometry, vertical and horizontal measurements, variation of facial measurements, racial variation of the face.

## INTRODUCTION:

Physical beauty is only one element of true beauty in humans, other qualities of the mind and soul is the substance of true beauty ${ }^{(1)}$. The facial beauty is influenced by symmetry of the face and harmonious facial proportions. Restoration of facial proportions and elimination of disproportionate relationship is the key to restoration of facial harmony.
Anthropometry is the systematic quantitative representation of the human body; it used to measure the absolute and relative variability in

[^0]size and shape of the human body ${ }^{(2)}$. During the last centuries, there have been remarkable changes in anthropometric measurements due to geographical, cultural, genetic and environmental factors ${ }^{(3,4)}$.
The earliest recorded facial analysis is in the ancient Greek canons (c. 450 B.C). Leonardo da Vinci (1452-1519 A.D.), the Renaissance artists, used the Canons of ancient Greeks and established the system of the "neoclassical canons" (5). Studying human face and facial dimension attract the attention of the artists and scientist in both medical and dental fields for diagnosis and treatment. At present time, plastic surgeons worldwide are still under the influence of the proportions that are based upon da Vinci neoclassical canons ${ }^{(3)}$.

Farkas et $\mathrm{al}(1985)^{3}$ and Jayaratne et al (2012) ${ }^{(6)}$ , were the first investigators to test the validity of neoclassical facial canons; by studying facial measurements of North American Caucasians at different ages ${ }^{(3)}$. Later these canons were tested on several ethnic groups as Persian ${ }^{(7)}$, Chinese ${ }^{(8)}$ , African-American ${ }^{(9)}$ and Turkish ${ }^{(10)}$. These studies were performed with manual anthropometry in which measurements were directly taken from the candidates.
Seeking facial aesthetic surgery has become a cultural custom in our society. With the advance in media and communications, the interest in cosmetic and reconstructive surgery increases, and more procedures performed on subjects of different racial and ethnic back ground. Many do not necessarily wish to lose their ethnic identities but simply hope to improve their beauty by bringing features that are out of proportion back toward proportions that are typical to their race i.e. they wish to preserve their ethnic features through cosmetic procedure ${ }^{(7,11)}$, but most plastic surgery textbooks dedicate the chapters on the perfect facial proportions that are derived mainly from neoclassical canons and studies that concentrated on North American White or European subjects. ${ }^{(11)}$ The application of these values on people of other racial and ethnic backgrounds can result in disagreeing features, loss of identity, and an unnatural appearance which is not aesthetically pleasing.
Facial analysis is a critical component of the preoperative assessment in facial plastic surgery, for procedures such as rhinoplasty, blepharoplasty, eyebrow lift... etc. The anthropometric differences between the population of Basrah and other people worldwide is due to the differences and variations in bone, cartilage and soft tissue covering in different ethnic group ${ }^{(12)}$.These differences are responsible for the special facial features in different ethnic groups, therefore, It should be maintained during reconstructive or aesthetic surgery otherwise the patients will lose their ethnic features ${ }^{.(11)}$
The populations of Basrah are heterogeneous formed of the following races :( Wikipedia)
1)Semite: Arabs, Assyrian, Chaldean, SyrianAramic, Hebrews and Mandaeans.
2) Arian: Armenian, Turk, Persian and Kurd.
3)Mix: interracial marriages.

There are no comprehensive anthropometric studies in the literature were done on analysis of facial measurements on Iraqi population (as far as the authors know). This study has been done on a large scale ( 1000 volunteers) involving
different races and ethnic group which are part of the mosaic population of Basrah.

## AIM OF THIS STUDY:

To compare the facial measurements between the different ethnic groups among the population of Basrah on one side and with the population of nearby countries (e.g. Iran, Turkey and Arab countries) with similar ethnic group, highlighting the differences between these groups will possibly help aesthetic surgeons understand the hints of a particular ethnic group and help to guide the preoperative planning.
MATERIAL AND METHODS:
This is a cross section study with a comparative component conducted in different parts of Basrah governorate. The data was randomly collected from volunteers, for the period from February to July 2013. Raw data used in this study originates from a total number of 1000 adults ( 526 female and 474 male) of different races living throughout Basrah governorate and was used to create a database for statistical analysis. Volunteers were selected between the ages of 1840 years from educational, health and religious institutes, irrespective to their social or educational back grounds.
Demographic data, including age and parental heritage, were obtained from volunteers. A requirement for inclusion of the candidate was that both his /her parents were from the races studied (excluding African Iraqi and Anglo Indian).
All subjects participate in this study had to meet the following criteria; they have to be 18 years of age and above (to minimize the effects of ageing on the facial measurements), no obvious facial deformities, no history of chronic disease that may alter the craniofacial morphology, no history of medical treatment that could produce distortion of normal facial landmarks, no history of maxillofacial, plastic or reconstructive surgery, and lastly no history of major trauma. Verbal consent was obtained from the participants and the approval of the ethical committee of Basrah Medical College.
The standard instruments used in this study were calipers for large round measures, sliding calipers for short distance measures and measuring tape (Fig 1). Surface landmarks were noted on the face before taking the standard anthropometric measurement. The head orientation was achieved by positioning the head so that the Frankfurt horizontal plane aligns parallel to the floor. The facial midline was determined by three anatomical landmarks: the
nasion, the subnasal, and the gnathion. The horizontal or vertical measurements were performed according to the classical methods of the physical anthropometry. Fig 2
The following points were selected as facial land marks:

1. Vertex (v): The highest point on the head when the head is oriented in the Frankfort horizontal plane.
2. Trichion (tr) : A point at on the hairline in the midline of the forehead.
3. Glabella (g) : The most prominent point in the median sagittal plane between the supraorbital ridges.
4. Nasion (n) : The midpoint on the soft tissue contour of the base of the nasal root at the level of the frontonasal suture.
5. Subnasale (sn) : The midpoint on the nasolabial soft tissue contour between the lower border of the nasal septum and the cutaneous portion of the upper lip.
6. Alare (al) : The most lateral point on each alar contour
7. Exocanthion (ex) : The soft tissue point located at the outer commissure of each eye fissure.
8. Endocanthion (en) : The soft tissue point located at the inner commissure of each eye fissure.
9.zygion ( $\mathbf{z y}$ ) : The most lateral point on the zygomatic arch.
9. Cheilion (ch) : The point located at each labial commissure.
10. Gnathion (gn) : The lowest median landmark on the lower border of the mandible.
11. Superaurale (sa) : The highest point of the free margin of the auricle.
12. Subaurale (sba) : The lowest point of the free margin of the ear lobe

The selection of potential craniofacial measurements is almost limitless; however, the craniofacial measurements that are frequently used in plastic and reconstructive surgery were specifically looked for, which include the following parameters;

1. Height of calva ( $\mathbf{v}-\mathbf{t r}$ ),
2. Forehead height $I(\mathbf{t r}-\mathbf{g})$, forehead height.
3. Forehead height II ( $\mathbf{t r} \mathbf{-} \mathbf{n}$ ), upper $3^{\text {rd }}$
4. Special upper face height ( $\mathbf{g}-\mathbf{s n}$ ),
5. Nose length ( $\mathbf{n}-\mathbf{s n}$ ), middle $3^{\text {rd }}$
6. Lower face height (sn- gn), lower $3^{\text {rd }}$
7. Intercanthal distance (en- en), ICD
8. Eye fissure width (ex-en),
9. Nose width (al- al),
10. Mouth width (ch-ch),
11. Face width (zy-zy).

In this study, seven of the canons (2-8) were used to compared our results with other studies worldwide.
The computer program SPSS version 15.0 was used for statistical analysis. This program has a comprehensive system for data analysis. It also automatically excludes individuals from an analysis if they do not meet the criteria, or if any of chosen variables are missing from their record.
Neoclassical canons (Formula): Farkas et al (1985)
(1) Formula 1: Special head height (v-en) = special face height (en-gn).
(2) Formula 2: Forehead height II $(\operatorname{tr}-\mathrm{n})=$ nose length $(\mathrm{n}-\mathrm{sn})=$ lower face height $(\mathrm{sn}-\mathrm{gn})$.
(3) Formula 3: Height of the calva ( $v-\operatorname{tr}$ ) $=$ forehead height $I(\operatorname{tr}-\mathrm{g})=$ special upper face height $(\mathrm{g}-\mathrm{sn})=$ lower face height $(\mathrm{sn}-\mathrm{gn})$.
(4) Formula 4: Nose length ( $n-s n$ ) $=$ ear length (sa-sba).
(5) Formula 5: Interocular distance(en- en) = nose width(al- al)
(6) Formula 6: Interocular distance(en- en) $=$ right or left eye fissure(ex-en)
(7) Formula 7: Mouth width (ch- ch) $=1.5$ nose width(al- al)
(8) Formula 8: Nose width(al- al) $=1 / 4$ face width (zy-zy)
(9) Formula 9: Nasal bridge inclination = inclination of the longitudinal axis of the auricle.

## RESULTS:

The total number of the participants was 1000 volunteers. Males were 474(47.4\%) and females were $526(52.6 \%)$, males to females ratio $=0.9: 1$. The males were 391(82.5\%) Semite, 55 (11.6\%) Arian and 28 ( $5.9 \%$ ) mixed. The females were divided between races as well, Semite were $368(67.0 \%)$, Arian $77(14.6 \%)$ and mixed 81(15.4\%).
The relation between the three section facial profile (Canon 2) in all races are not equal, in fact the upper $3^{\text {rd }}(\operatorname{tr}-\mathrm{n})$ and lower $3^{\text {rd }}(\mathrm{sn}-\mathrm{gn})$ are greater than middle $3^{\text {rd }}(\mathrm{n}-\mathrm{sn})$ i.e. nose length. The ratio between the three sections in all races and sexes are constant (1.5, 1, and 1.3). All the races and sexes show that upper $3^{\text {rd }}$ (tr- n / forehead height II) and lower $3^{\text {rd }}$ ( sn - gn/ lower facial height) are greater than the middle $3^{\text {rd }}$ ( n $\mathrm{sn} /$ nose length), and the upper $3^{\text {rd }}$ is greater than the lower $3^{\text {rd }}$. Semite has the tallest upper $3^{\text {rd }}$ but the smallest middle $3^{\text {rd }}$ in males. Arian has the highest mid- $3^{\text {rd }}$ in males and the smallest upper $3^{\text {rd }}$. The upper $3^{\text {rd }}$ is 23.1 mm longer than the
middle $3^{\text {rd }}$, the lower $3^{\text {rd }}$ mean length is 13.9 mm longer than middle $3^{\text {rd }}$. The upper $3^{\text {rd }}>$ lower $3^{\text {rd }}$ $>$ middle $3^{\text {rd }}$ (Forehead height II > lower face height > upper face height). (Table 1) (Fig. 3)
Relation of four section facial profile (Canon 3), the height of the calva ( $\mathrm{v}-\mathrm{tr}$ ) was found to be smaller than forehead height I (tr- g), special upper facial height ( $\mathrm{g}-\mathrm{sn}$ ), and lower facial height (sn- gn). In approximately all the subjects, the forehead height $\mathrm{I}(\mathrm{tr}-\mathrm{g})$, the special upper facial height ( $\mathrm{g}-\mathrm{sn}$ ), and the lower facial height (sn- gn) are nearly equal. All the vertical measurements are within slight differences from each other with the exception of the height of the calva ( $\mathrm{v}-\mathrm{tr}$ ) which is about 10 mm less than the others, and it has been used as a base for comparing other measurement. The four section are not equal i.e. $25 \%$ each, but in this study its $21 \%, 26 \%, 26 \%, 27 \%$ respectively. (Table 2)(Fig. 4)

The Naso-aural proportion (Canon 4), show that in all the races, the relations between the ear and nose length are not equal. The ear length is greater than the nose length; the mean ratio is 1 : 1.4. The Arian males and females have the longest measurements, i.e, the longest ears. Shortest nose was found in Semite males and females while shortest ear was found in mix race male and female, therefore, the nose length is less than ear length in all races. The differences in length range from 22 mm in Arian males to 15.9 mm in mixed males with mean differences of 18.6 mm . (Table 3) (Fig.5)
Assessment of orbito-nasal proportion (Canon 5) shows that the alar width is slightly wider than the intercanthal distance. The ratio is 1: 1.1. Arian male and female have wider ICD, while Semite male and female has a relatively wider nose. The differences between the measurements range from 5.5 mm in Semite males to 2.3 mm in Arian females, with the mean difference of 3.6 mm ( 2.9 in females \& 4.5 mm in males), therefore, the relationship will be, en- en< al- al . (Table 4) (Fig.5)
The most common finding in evaluation of orbital measurements (canon 6) was an eye fissure length (en- ex) is slightly greater than the intercanthal distance (en- en). The differences between them are only 1-2 millimeters. The difference range from 0.9 mm in Arian males to 2 mm in mix females, with mean of 1.48 mm ( 1.2 mm in males \& 1.8 mm in females). The ratio in general is $1: 1$ in all races with slight difference in females of Arian and mix races. Arian males and females have relatively wider
(en- en) measurements than other races (ex- en $\leq$ en- en). (Table 5) (Fig.5)
Naso-oral canon (Canon 7), in this study, we found that the mouth width is < 1.5 times the alar width. The ratio is $1: 1.4$. The Arians have the largest mouth and Semites have relatively the broadest nose. The differences between the mouth and nose width are between 12 mm in Semite males and 14.3 mm in Arian male. Therefore, the Naso- oral relation is ch- ch $=1.4$ al- al. (Table 6) (Fig.5)
Evaluation of nasofacial proportion (Canon 8/ al$\mathrm{al}=1 / 4 \mathrm{zy}-\mathrm{zy}$ ) shows that the alar width is wider than one quarter of the facial width in all subjects. In this study the alar width is $1 / 3$ of the face width and the relation in both sexes and races is $1 / 3$. Arians males have the widest upper face zy- zy. Semites have the broadest nose. The relation will be al- al $=1 / 3$ zy- zy $(=0.34)$. (Table 7) (Fig.5)

## DISCUSSION:

Analysis of the face is the first step in assessment of the patient who presents for plastic and reconstructive facial surgery. Each human have different facial measurements that ensure her or his individuality. The result of this study shows that the average young Iraqi face significantly differs from the neoclassical canons and North American Caucasian face. Twelve measures were taken from the volunteers of both sexes and were compared with different studies from other countries. The probability of error is elevated with large sample. Although some of these measures have a difference of only $2-3 \mathrm{~mm}$, the overall composition of the values shows a distinctly different appearance.
The neoclassical canons were originally formulated by artists of the Renaissance to describe the relationships between various areas of the head and face as a guide for artists. ${ }^{(13,14,15)}$ Its influence diminished by the late 19th century, but it remains as the basis on which modern facial analysis is based. ${ }^{(13,16)}$ In comparing our data with the neoclassical canons it shows that our result doesn't fit the established proportions, as well as with the data from North American Caucasian. ${ }^{(12)}$
From the total of 1000 volunteer, the majority in both males and females were Semite of different ethnic back ground, the reason for that difference because Semite forms the majority of the population of the land. Males to Females ratio are nearly equal ( $0.9: 1$ ), the reason for females' predominance is the difficulty to get excess were

## FACIAL MEASUREMENTS

males are predominant as in factories and military institutes.
In this study we found that the vertical 3 section facial study are not equal (as shown in Table 1), the middle $1 / 3$ found to be smaller than both upper $1 / 3$ and lower $1 / 3$ and the upper $1 / 3>$ lower 1/3. Farkas et al ${ }^{(3)}$ shows similar result in North American Caucasian, as well as Torsello et al ${ }^{(17)}$ found that, the upper and lower thirds in Italians are equal and both are longer than middle $1 / 3$. Sepehr et al ${ }^{7}$, found the same in Persian women. (Table 1)
The four section facial study shows that the height of the calva ( $\mathrm{v}-\mathrm{tr}$ ) is the smallest of all the other sections of face vertical measurements, there is a little variation in measurements between the sexes and races. There are only 2 3 mm differences between the sections. Farkas et $\mathrm{al}^{(3)}$ study show that calva height ( v -tr) < lower face height (sn- gn) and the smaller forehead height (tr- g) < lower face height (sn- gn). According to Da Vinci's Neoclassical canons ${ }^{5}$ the four sections are equal i.e. $25 \%$ of the vertical length of the face, but in this study, we found that the length of the different part are $21 \%, 26 \%$, $26 \%$, $27 \%$ respectively in both males and females with little variation between races and sexes. (Table 2)
The Naso aural proportion shows a difference than canon 4 (sa- sba=n- sn ). The ear and nose length are not equal, the nose length is smaller than ear. The ear is 1.4 times the length of the nose. The Italian study ${ }^{17}$ show that the nose is smaller than the ear as well as the AfricanAmerican women ${ }^{(13)}$ and North American Caucasian ${ }^{(3)}$, but the Turkish study ${ }^{(10)}$ show that the nose length is longer than ear length. In African-American women ${ }^{(13)}$, the ear is longer by 9.4 mm , and in North American Caucasian ${ }^{(3)}$ its 8.4 mm . In Persia ${ }^{(7)}$ its 5.2 mm . In this study the average differences between the ear and nose measurements are 19.2 mm in male and 18.7 mm in females. (Table 3)

Orbito nasal canon (al-al= en-en). Our measurements show that alar width is wider than ICD (en- en) and alar width is 1.1 times the ICD. The Semite show relatively wider nose as they are from hot climate area ${ }^{(18)}$, while Arian have wider ICD as they are from mountain area ${ }^{(19)}$, $\mathrm{al}-\mathrm{al}=1.1 \mathrm{ICD}$ in all the studies, the Italian ${ }^{(17)}$, the Turkish ${ }^{(10)}$ and the Persian ${ }^{(7)}$ the nose is wider than ICD. In the Chinese study by Jayaratne et al ${ }^{(6)}$, the ICD is wider than the nose, while Farkas ${ }^{(3)}$ Show that half of the volunteers have equal measures. It is not aesthetically pleasing to have the alae narrower than the ICD. The nasal width / ICD ratio should not be less than 1. ${ }^{(6)}$ (Table 4)
Orbital canon, here we found that the eye fissure length is slightly longer than ICD by $1-2 \mathrm{~mm}$. The ratio is $1: 1$ with the exception of females of Arian and mix races were the ratio is 1: 1.1. Same in in Italian ${ }^{(17)}$, Turkish ${ }^{(10)}$, African American ${ }^{(13)}$ and Persian ${ }^{(7)}$. While en- ex < enen in Afro- American ${ }^{(20)}$ and South Chinese ${ }^{6}$. In American Caucasian ${ }^{3}$ the eye fissure length is smaller than I CD (en- ex <en-en). (Table 5)
Naso oral canon; we found that the mouth width (ch-ch) is not equal to 1.5 times the alar width (al- al), but it's 1.4 times the nasal width and in Semite males it's even less 1.3 times. It may be due to slightly wider nose in Semites as they are from hot area ${ }^{(18)}$, ch- ch < 1.5 al- al, its $1.3-1.4$. Same results in Italian ${ }^{17}$, Turkish ${ }^{10}$ and Persian ${ }^{7}$, while nasal width (al- al) is wider in AfroAmerican ${ }^{20}$ and American Caucasian ${ }^{3}$ ch- ch> $1.5 \mathrm{al}-\mathrm{al}$. (Table 6)
Naso facial proportion; (al- al =1/4 zy-zy). This study show that the nose is wider than $1 / 4$ the face width, and the relation is al- al $=1 / 3 \mathrm{zy}-\mathrm{zy}$. In Italian ${ }^{17}$ it's the same $<1 / 4$, while in African American ${ }^{(13),}$ zy- zy is wider. The American Caucasian ${ }^{3}$ Show that $39 \%$ of cases its $<1 / 4$ and $37 \%$ are $=1 / 4$. (Table 7)
The mean width / length ratio of the nose in Basrah population is 0.764 ( $0.738-0.785$ ). African American ${ }^{13}$ reported a mean of 1.1 and Powell \& Humphrey ${ }^{21}$ reported a mean of 0.7.

Table 1: Relation of the 3-section facial profile.

| Race | Sex | Upper 1/3 <br> tr-n | Mid 1/3 <br> n-sn | Lower 1/3 <br> Sn-gn | Ratio |
| :---: | :--- | :--- | :--- | :--- | :--- |
| Semite | Male | 73.1 | 48.0 | 62.7 | $1.5: 1: 1.3$ |
|  | Female | 70.6 | 45.5 | 59.8 | $1.6: 1: 1.3$ |
| Arian | Male | 72.4 | 49.5 | 64.7 | $1.5: 1: 1.3$ |
|  | Female | 64.6 | 44.6 | 57.2 | $1.5: 1: 1.3$ |
| Mix | Male | 72.4 | 49.4 | 61.8 | $1.5: 1: 1.3$ |
|  | Female | 66.8 | 44.3 | 58.4 | $1.5: 1: 1.3$ |

Table 2: Relation of four section facial profile.

| Race | Sex | $\mathrm{v}-\mathrm{tr}$ | $\operatorname{tr}-\mathrm{g}$ | $\mathrm{g}-\mathrm{sn}$ | $\mathrm{sn}-\mathrm{gn}$ | Ratio |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Semite |  |  |  |  |  |  |
|  | Male | 50.0 | 61.1 | 60.1 | 62.7 | 1:1.2: 1.3: 1.3 |
| Arian | Male | 43.6 | 50.2 | 60.6 | 57.5 | 59.8 |
| $1: 1.3: 1.3: 1.4$ |  |  |  |  |  |  |
|  | Female | 49.1 | 52.6 | 66.8 | 64.7 | $1: 1.2: 1.2: 1.3$ |
| Mix | Male | 53.0 | 60.9 | 61.8 | 61.2 | $1: 1.1: 1.2: 1.2$ |
|  | Female | 45.10 | 54.8 | 56.5 | 58.4 | $1: 1.2: 1.2: 1.2: 1.3$ |

Table 3: Naso-aural canon.

| Race | Sex | Ear length <br> $\mathrm{sa}-\mathrm{sba}$ | Nose length <br> $\mathrm{n}-\mathrm{sn}$ | Ratio |
| :--- | :--- | :--- | :--- | :--- |
| Semite | Male | 67.6 | 48.0 | $1.4: 1$ |
|  | Female | 63.2 | 45.5 | $1.4: 1$ |
| Arian | Male | 71.5 | 49.5 | $1.4: 1$ |
|  | Female | 65.1 | 44.6 | $1.4: 1$ |
| Mix | Male | 65.3 | 49.4 | $1.4: 1$ |
|  | Female | 62.3 | 44.3 | $1.4: 1$ |

Table 4: Orbito nasal canon.

| Race | Sex | I.C.D <br> en- en | Nose width <br> al- al | Ratio |
| :--- | :--- | :--- | :--- | :--- |
| Semite | Male | 32.2 | 37.7 | $1: 1.2$ |
|  | Female | 31.6 | 34.5 | $1: 1.1$ |
| Arian | Male | 33.1 | 37.5 | $1: 1.1$ |
|  | Female | 32.0 | 34.3 | $1: 1.1$ |
| Mix | Male | 32.8 | 36.5 | $1: 1.1$ |
|  | Female | 31.5 | 34.3 | $1: 1.1$ |

Table 5: Orbital canon.

| Race | Sex | en- en | en- ex | Ratio |
| :--- | :--- | :--- | :--- | :--- |
| Semite | Male | 32.2 | 33.5 | 1.04 |
|  | Female | 31.6 | 33.0 | 1.04 |
|  | Male | 33.1 | 34.0 | 1.03 |
|  | Female | 32.0 | 33.9 | 1.06 |
| Mix | Male | 32.8 | 34.2 | 1.04 |
|  | Female | 31.5 | 33.5 | 1.06 |

Table 6: Naso oral canon.

| Race | Sex | ch-ch | al- al | Ratio |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |
| Semite | Male | 49.7 | 37.7 | 1.3 |
|  | Female | 47.5 | 34.5 | 1.4 |
|  | Male | 51.8 | 37.5 | 1.4 |
|  | Female | 48.4 | 34.3 | 1.4 |
| Mix | Male | 49.5 | 36.5 | 1.4 |
|  | Female | 46.9 | 34.3 | 1.4 |

Table 7: Naso facial canon.

| Race | Sex | al- al | zy- zy | Ratio |
| :--- | :--- | :---: | :---: | :--- |
| Semite | Male | 37.7 | 122.3 | 3.2 |
|  | Female | 34.5 | 120.0 | 3.5 |
| Arian | Male | 37.5 | 125.0 | 3.3 |
|  | Female | 34.3 | 120.1 | 3.5 |
| Mix | Male | 36.5 | 123.0 | 3.4 |
|  | Female | 34.3 | 120.0 | 3.5 |



Fig 2: Facial landmark.


Fig 3: The three sections facial profile.


Fig 4: The four section facial profile.


Fig 5: Horizontal facial measurements.

## CONCLUSION:

Anthropometric analysis of the face of Iraqi population suggests differences compared with the North American white and other faces. Thus, a single aesthetic ideal worldwide is inapplicable. In addition, the local people do not fit the neoclassical canons of facial proportion. The general principles of plastic surgery apply to all races, but retaining the ethnicity and natural appearance of the face should be kept in mind.
Neoclassical canons were originally formulated as a guide for artist and not for real world of surgeon ${ }^{(3)}$.
In comparing our data with the neoclassical canons, we found that our measurements doesn't fit the canons establish proportion. The results suggested that there are differences in facial measurements, although slight, between different ethnic groups in Iraq, and between Iraqi population in general and the population of other countries, therefore, aesthetic measurements applied to all races are inapplicable.
This study has laid down a basic ground for further studies and analysis of the faces of Iraqi population in other parts of Iraq especially in north and west regions.
When we study the different races from Iraq, we found differences with the identical races from neighboring countries. This proved that Iraqi population from different racial background has mixed over the years from interracial marriages, and now there are very little facial differences between the races.

## CONCLUSION:

The facial formula regarding Iraqi populations can be summarized as:

1) The three section facial profile are not equal, the relation of upper to middle to lower thirds are 1.5:1:1.3.
2) The four section facial profile are not equal, the relation of its component, are1:1.2:1.2:1.3
3)Naso aural formula are not equal, the relation of nose length to ear length is 1:1.4.
3) Orbito nasal formula are not equal, the relation of inter canthal distance to nose width is $1: 1.1$
4) Orbital formula are not equal, the relation of inter canthal distance to the length of palpebral fissure is $1: 1.045$.
6)Naso oral formula, the relation of width of the mouth to alar width is 1.4: 1
7)Naso facial formula, the relation of alar width to face width is 3.4:1

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