COMPARISON OF CEPHALOMETRIC NORMS OF LIBYANS WITH FIVE OTHER ETHNIC GROUPS

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INTRODUCTION

It is an established fact that cephalometric norms help us in diagnosing, planning and treating an Orthodontic case. In the recent past, the world is developing rapidly in all spheres and it is of particular interest to us as Orthodontists to observe the racial admixtures resulting in different norms for different ethnic groups. It is also important to know the differences among the various ethnic groups, so that the individual variations could be borne in mind while planning treatment. The cephalometric norms of the Libyan Arab people were established in a study[1] by the authors, which is under publication.

The aim of the present study is to compare the cephalometric norms to know the differences and similarities of the Libyan Arab people with the norms of other ethnic groups.

MATERIALS AND METHODS

1. The cephalometric norms, which were established by the authors in a previous study[5] were used to compare with the relevant cephalometric norms of five other ethnic groups namely: Egyptian, Iranian, South African Negroid, Japanese and Caucasian.
2. It was interesting to note that the number of norms established by each author were different from those of others and hence, only those norms, which were common between the two studies, were used for comparison.
3. The cephalometric norms for Egyptians established by Samir et. al[11]. The cephalometric norms for Iranians as established by Mohammed Hajighadimi et. al[7], for South African Negroes, was established by Alex Jacobsen[2], for Japanese by Miura[6] and for Caucasians by Broadbent and Broadbent[15] were used for comparison with the Libyan norms in this study.
4. The cephalometric norms of the Libyans were compared with those of the other ethnic groups using 't' test.

RESULTS

The twenty-four norms which were common between the Egyptian and Libyan groups are presented in Table - I along with the significant values of the 't' test. There was a significant difference only in case of articular angle, gonial angle and nose tip.

Table - II represents the fourteen common norms of Iranians and Libyans along with significant values. Pg to NB distance was highly significant.

The significant values between the norms of Libyans and South African Negroids are presented in Table - III. Except for SNB angle, Maxillary plane to SN plane, occlusal plane to SN plane and 1 to NA mm, all other values show highly significant values.

The twelve norms which were common between the Japanese and Libyan groups are presented in Table - IV along with the significant values. Except for SNA and 1 to NA, all other norms show highly significant differences.

Table - V represents the twenty-seven common norms of Caucasian and Libyans along with the significant values of 't' test. There is highly significant difference between the two groups except for ANB, Facial angle and S to N.

A quick reference guide to compare some of the common norms of all the six groups of this study is presented in Table - VI.

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TABLE - I

Sl. No.	Variable	N=60 LIBYAN NORMS		N=200 EGYPTIAN NORMS		'P' Value	
		Norm	SD	Norm	SD		
1	SNA	81'	3.48	82'	4.0	-1.747	NS
2	SNB	78.5'	3.33	79'	4.0	-0.8808	NS
3	ANB	2.5'	1.29	3'	1.0	-0.3166	NS
4	FACIAL ANGLE	87'	3.7	87'	4.0	0	NS
5	SN - Pg	80'	3.5	70'	3.0	0	NS
6	ANG. OF CONVEX	3'	2.96	4'	4.0	-1.794	NS
7	MAX. PL - SN	10'	3.98	9'	3.0	1.763	NS
8	MAN. PL - SN	33'	5.43	32'	5.0	1.331	NS
9	FMA	25.5'	6.12	25'	3.0	0.8628	NS
10	Y - AXIS	61'	3.91	61'	4.0	0	NS
11	N - S - Ar	126.5'	6.4	132'	5.0	-6.982	****
12	GONIAL ANGLE	121.5'	6.99	124'	5.0	-3.077	***
13	AFH / PFH	0.66	0.049	0.66	5.0	0	NS
14	Pg to NB	2.5 mm	1.52	2.0 mm	1.0	0.2994	NS
15	T to Apo	3.5 mm	2.44	4.0 mm	2.0	-1.610	NS
16	1 to FH	118'	6.63	112	6.0	6.629	****
17	1 to NA	23'	6.01	24	5.0	-1.294	NS
18	T to MP	94.5'	10.57	95	5.0	0.5073	NS
19	T to NB	28'	11.63	27	4.0	1.03	NS
20	1 to T	128'	8.31	127	8.0	0.7083	NS
21	1 to NA mms	5mm	2.38	5mm	2.0	0	NS
22	1 to NB mms	6mm	2.31	6mm	2.0	0	NS
23	'H' ANGLE	9mm	3.84	10	4.0	-1.714	NS
24	NOSE TIP	10mm	4.25	8mm	4.0	3.348	***

NS = Not Significant * = P Value < 0.05 *** = < 0.01
** = < 0.02 **** = < 0.001

DISCUSSION

From the results of the study, many interesting observations regarding the variations in cephalometric norms in various ethnic groups were observed from the statistical analysis. In the absence of universally accepted or standardized norms to be determined for any ethnic group, there was a vast difference in the number of norms established by each author whose studies were included[2, 6, 7, 15] for comparison. The limitation eluded the possibility of comparing all the five studies together; hence the Libyan's norms were compared individually with those of the other groups. However Table - VI was made only to have a quick comparison of all the six groups included in the study.

It was interesting to find that there was no difference between Libyan and Egyptian norms except that the saddle angle is increased in Egyptians and nose

TABLE-II

Sl. No.	Variable	N = 60 LIBYAN NORMS		N = 67 IRANIAN NORMS		'P' Value	
		Norm	SD	Norm	SD		
1	SNA	81'	3.48	81'	3.35	0	NS
2	SNB	78.5'	3.33	78'	3.19	-0.8640	NS
3	ANB	2.5'	1.29	3'	2.10	-1.594	NS
4	SND	76	3.18	75.5	3.22	0.8790	NS
5	MP to SN	33	5.43	35'	4.86	-2.190	*
6	FMA	25.5	6.12	27.5	5.52	-1.936	NS
7	OCCL. PL to SN	16.5	3.84	17'	3.51	-0.7668	NS
8	Pg to NB point	2.5mm	1.52	1.13	1.16	5.790	****
9	1 to NA	23'	6.01	23	5.60	0	NS
10	T to MP	94.5'	10.57	96	6.16	-1.428	NS
11	T to NB	28'	1.63	29'	4.81	-0.6595	NS
12	1 to T	128'	8.31	125'	6.94	2.215	*
13	1 to NA mm	5mm	2.38	6mm	1.99	-2.577	*
14	T to NB	6mm	2.31	6.5mm	1.56	-1.470	NS

NS = Not Significant * = P Value < 0.05 *** = < 0.01
** = < 0.02 **** = < 0.001

TABLE-III

Sl. No.	Variable	N = 60 LIBYAN NORMS		N = 67 IRANIAN NORMS		'P' Value	
		Norm	SD	Norm	SD		
1	SNA	81'	3.48	84.9	3.88	5.683	****
2	SNB	78.5'	3.33	79.6	3.73	-1.671	NS
3	ANB	2.5'	1.29	5.4	2.74	-7.360	****
4	FACIAL ANGLE	87'	3.7	90.85	3.54	-5.691	****
5	MAX. PL - SN	10'	3.98	9.2	6.65	0.7903	NS
6	MAND. PL - SN	33'	5.43	37.8	4.78	-5.013	****
7	GONIAL ANGLE	121.5'	6.99	124.3	4.18	2.578	**
8	OCCL. PL - SN	16.5'	3.84	16.8	4.35	-0.3927	NS
9	S to N in mm	72.5	3.69	67.8	3.83	6.702	****
10	1 to NA'	23'	6.01	17.9	8.12	3.849	****
11	1 to T	128'	8.31	116.35	18.09	4.498	****
12	1 to NA mm	5mm	2.30	6.0	2.65	-2.132	*

NS – Not Significant * = P Value < 0.05 *** = < 0.01
** = < 0.02 **** = < 0.001

TABLE-IV

Sl. No.	Variable	N = 60 LIBYAN NORMS		N = 90 IRANIAN NORMS		'P' Value	
		Norm	SD	Norm	SD		
1	SNA	81'	3.488	81.3	3.2	0	
2	SNB	78.5'	3.338	76.8	3.0	3.726	****
3	ANB	2.5'	1.296	4.5	1.7	-7.586	****
4	SND	76'	3.186	73.4	3.1	5.114	****
5	MP to SN	33'	5.437	36.2	4.5	-3.603	****
6	OCCL. PL - SN	16.5'	3.845	20	3.7	-5.670	****
7	Pg to NB	2.5	1.52	0.43	1.3	8.258	****
8	1 to NA'	23'	6.015	24.1	4.9	-0.861	NS
9	T to NB'	28'	11.63	31.2	5.6	-2.405	**
10	1 to T	128'	8.31	120.3	8.5	5.391	****
11	1 to NA mm	5mm	2.38	5.9	1.8	-2.670	***
12	1 to NB mm	6mm	2.315	7.8	2.1	-5.527	****

NS = Not Significant * – P Value < 0.05 *** – < 0.01

** = <0.02 **** = < 0.001

tip is relatively larger in Libyans.

Compared with Iranians, Libyans have prominent chin button and relatively upright incisors.

When South African Negroes, were compared with Libyans, South African Negroes have prognathic profile, prognathic maxilla, skeletal class II relationship, short anterior cranial base, upright upper incisor, decreased inter-incisal angle with vertical growth pattern tendencies.

When Japanese and Libyans were compared, Japanese were found to have retruded mandible, tendencies for Class II malocclusion, and bidental protrusion. On the other hand, Libyans had prominent chin button.

When Caucasians and Libyans were compared, Libyans had retrognathic maxilla and mandible, but maxillo - mandibular relationship was normal. In addition, maxilla was short, mandible was longer, less prominent chin, increased lower facial height and there was a tendency for vertical growth pattern.

SUMMARY

The study was conducted to compare the cephalometric norms of Libyans with the norms of five other ethnic groups namely: Egyptians, Iranians, South African Negroes, Japanese and Caucasians. It was evident from the study that the norms for different ethnic groups were different and standardization of the features to be included in the norms would help in easily observing the differences which would be of great help particularly for those clinicians who are working in a place where they have to cater to the needs of different ethnic groups.

TABLE - V

Sl. No.	Variable	N = 60 LIBYAN NORMS		N = 600 IRANIAN NORMS		'P' Value	
		Norm	SD	Norm	SD		
1	SNA	81'	3.48	83.9	2.43	-8.427	****
2	SNB	78.5'	3.33	81.2	2.63	-7.385	****
3	ANB	2.5'	1.29	2.7	1.39	1.069	NS
4	FACIAL ANGLE	87'	3.7	87.7	2.6	1.902	*
5	SN - Pg	80'	3.50	82.8	2.74	-7.342	****
6	ANG. OF CONVEX	177'	3.54	176.2	2.19	2.521	*
7	MAND. PL - SN	33'	5.43	28.8	3.57	8.220	****
8	FMA	25.5'	6.12	23.9	3.83	2.890	**
9	Y - AXIS	61'	3.91	60.2	3.03	2.367	*
10	N - S - Ar	126.5	6.4	121.4	4.35	8.241	****
11	GONIAL ANGLE	121.5'	6.99	124.8	4.05	-5.546	****
12	OCCL. PL - FM	9	3.87	8	2.98	2597	**
13	OCCL. PL - SN	16.5	3.84	12.9	3.31	7.912	****
14	S to N mm	72.5 mm	3.69	72.8	3.79	0.5801	NS
15	ANS - PNS mm	54.5	3.64	56.8	2.88	5.746	****
16	ANS - Gn mm	70.0 mm	5.23	65.4	4.96	6.816	****
17	N - ANS mm	55.5	3.45	54.3	3.58	2.483	*
18	N - Me MM	125.5	6.87	119.8	7.0	6.024	****
19	Pg - Gn mm	82.5	4.73	79.8	4.59	4.332	****
20	Pg - NB mm	2.5	1.52	3.3	1.63	8.647	***
21	1 to SN	104.5	6.81	100.2	5.68	5.485	****
22	1 to NA	23	6.01	16.2	5.59	9.417	****
23	T to MP	94.5	10.57	90.6	5.57	4.656	****
24	1 to NB	28	11.63	20.5	4.94	9.452	****
25	1 to T	128	5.31	140.6	8.16	-11.38	****
26	1 to NA mm	5	2.38	2.6	1.58	10.63	****
27	1 to NB mm	6	2.31	3.4	1.55	11.76	****

NS = Not Significant * = P Value < 0.05 *** = < 0.01

** = <0.02 **** = < 0.001

TABLE-VI

Sl. No.	MOEMS	LIBYAN HUSSEIN AND RANI	EGYPTIAN SAMIR ET. AL.	IRANIAN MOHMD. HAJIGHADIMI	STH. AFRIC NEG. ALEX JACOBSEN	JAPANESE MIURA	CAUCASIAN BROADBENT & BROADBENT
1	ENA	810	822	810	84.90	81.30	83.90
2	ENB	78.50	790	780	79.60	76.80	81.20
3	ANE	2.50	30	30	5.40	4.50	2.70
4	MAND. PL - SN	330	320	350	37.80	36.20	28.80
5	Eg to NB mm	2.5	2	1.13	-	0.43	3.3
6	⊥ to NA 0	230	240	230	17.90	24.10	16.20
7	⊥ to FA mm	5	5	6	6	5.9	2.6
8	T to MP0	94.50	950	960	-	-	90.60
9	⊥ to T	1280	1270	1250	116.350	120.30	140.6

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