ORIGINAL ARTICLE

Impact of chin profile changes on perceived attractiveness by specialists and lay people

F. Gholinia
Assisstant professor, Oro-Maxillofacial Developmental Disease Resaerch Center ,Department of Orthodontics,Guilan university of Medical Sciences,Rasht,Iran
A. Khalighi Sigaroudi
Assisstant professor, Department of Oral and Maxillofacial Surgery,Guilan University of Medical Sciences,Rasht,Iran
H.Hoormand
Dentist, Private

Background and aim: One of the most important reasons appealing orthodontic treatment or orthosurgery is the tendency to improve the face beauty. Since the main influence of orthodontic treatment is on the profile region particularly on the lower face therefore we focused chin.
The aim of this study was to compare the perception of attractiveness among orthodontist, surgeon and lay people in case of vertical & horizontal changes in silhouette profile of chin.
Materials and method: In the present research, we chose two standard profile pictures (a man and a woman) from reliable resources. Each picture have been changed to silhouette using Photoshop CS2 program. Then we changed the chin position in vertical and horizontal dimensions for 2mm incrementally. The range of changes in vertical dimension for man's picture was between -6 to +6 and for women was between -4 to +4. Also in horizontal dimension, the range of changes in man's pictures was from -10 to +10 and for woman's picture was between -8 to +8. The observers received the PowerPoint file contained the images and a questionnaire which included the number of pictures and some relevant questions. They had 3 minutes to give a score to each picture according to their judgement from 1 to 5; 1 for the best and 5 for the worst one. Data were analyzed using descriptive and inferential statistics tests (Independent t- test, chi square and ANOVA and logestic regression model) at p< 0/05 with SPSS 19.

Results : All groups found our normal profile as the best one. There were difference among findings of 3 groups(P=0.002) . When comparing 2 groups , we did not find difference between omfs and orthodontists. Age and history of cosmetic procedures are factors that have significant effect on people's perception.

Conclusion : The beauty priority among 3 groups are the same but generally there are significant differences between specialists and lay people.

Keywords: Chin, Silhouette , Profile, Orthodontist, Oromaxillofacial Surgeon

Received 10February 2014; accepted 4March 2014;Published 7 June 2014
Corresponder: Faegheh Gholinia
Oral and Maxillofacial Develop-mental Disease Research Center, Department of Orthodontics, School of Dentistry, Lakan Road, Fouman-Saravan High way, Guilan Univer-sity of Medical Sciences Complex Building, Rasht, Iran.
E-mail: gholiniaf@gmail.com

Introduction

Patients and their orthodontists agree on their main goal in treatment that is improving facial attractiveness; however it is a quit difficult thing to measure.[1] Face beauty is a result of appropriate composition of different parts in which profile proportions are the most insisted on.[2]

The chin is an important part of face that has significant effect on facial esthetic especially in the lower part.[3]Although changes in chin height and its anteroposterior position is attainable through some surgical procedures, it is important that the patient requiring surgical correction has thorough understanding of the proposed treatment and final result.[4]

Facial esthetic in the eye of specialists may not coincide with lay people's perception.[5]Beauty is a subjective phenomenon, that culture and ethnicity have their influence on it.[6]

Following orthognathic surgery with technically successful results, a corrected malformation may appear significantly acceptable to the surgeon but the patient may feel little improvement.[7] Dental professionals must understand patient's demands and perceptions of normal and how these differ from his/her own goals and perceptions.[8]

Also,because of large variation in soft tissue, decisions made over guide lines based on hard tissue relationships might not necessarily predict the actual soft tissue.[9]

The magnitude of deviation is a very important indicator for decision making about surgical involvement. There are quite large numbers of patients who are borderline cases. These group of patients can most take advantages of evidence based guidance according to studies investigating perception of facial attractiveness by different groups. Finding a clinically significant threshold value for acceptable chin position that beyond it is unattractive can be useful.[3]

The purpose of this study was to evaluate the ability of orthodontists, oral and maxillofacial surgeons and lay people to recognize incremental changes in vertical and horizontal chin dimension in silhouette profile view and compare their perception and preferences considering facial attractiveness.

Material & Methods

Two standard profile photos, one male and one female, were chosen from orthodontic references.[10] Then we made silhouette images using a graphic soft-ware (Adobe Photoshop CS2-US). Through this soft ware we also made incremental changes in horizontal and vertical position of chin by ±2mm. For smooth outline of lip and chin we followed Hershey and smith guideline.[9]

According to former studies[4,7,11] the range considered for anteroposterior change in chin was -6 to +6 for men and -4 to+4 for women ,and vertical changes were made from -10 to+10 for men and from-8 to+8 for women.(figure-1) At the end of this process we prepared 7 photos for men in vertical changes and 11 photos for horizontal changes , on the other side we had 5 photos for vertical changes and 9 photos for horizontal changes in women. Respondant's accuracy was tested by adding a duplicated photo in each part. We used randomly assigned two letter words to name each photo.

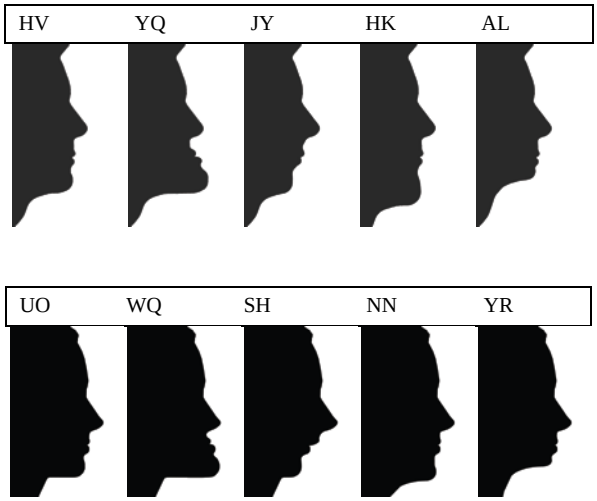

Figure1: Sample of silhouette images shows chin changes in different directions.

All photos were transferred to a power point soft-ware(Office ,Power Point 2012,Microsoft-US) and a presentation containing 36 slides in 4 parts was prepared. First part was men's photo with horizontal chin changes followed by vertical changes of this group, third and forth were women's images in the same order.

Respondents who took part in this study were 45 people in 3 groups:10 orthodontists,5 oromaxillofacial surgeons(OMFSs) and 30 lay people. All specialists were practicing in a city (Rasht,Iran)and lay people were gathered from patients of public and privatet dental clinics in the same city.

Power point was quick played once for each person to get familiar with the study and silhouette images. A 5 degree likert scale was used to score attractiveness of the images by respondants: 5=very bad , 4=bad, 3=medium ,2=good, 1=very good. Each person wasted 3 min on each slide to rate it according to his/her personal judgement.

Alongside a questionair was prepared to collect demographic informations about participants and some data about their educational status, job, history of cosmetic procedures or orthodontic /orthosurgery treatment for themselves or close relatives and finally the self beauty satisfaction. We askd them if they feeling need for surgical corrections in their face or their famili's.

Results

All data analysed in the spss version 19 with level of significane equal to 0.05.

Kappa coefficient used to test convergence of groups. Two tailed Independent t- test , chi square and ANOVA for univariate analyses .Background and demographic data were analysed also using multiple logestic regression test.

All observers preferred the normal image as the best profile for men and women and the extreme images as the worst but there were difference in scoring of 3 groups .(Table1)

Table 1. Mean observer rating scores and standard deviation for horizontal and vertical chin changes in men and women

	Image	Change(mm)	Mean	±SD	Variance
MEN	HV	0	1.84	.63	.40
	TI	+2H	2.75	.82	.68
	AZ	-2H	2.22	.70	.49
	GP	+4H	3.73	.61	.38
	WP	-4H	3.02	.89	.79
	EC	+6H	4.33	.70	.50
	IS	-6H	3.91	.51	.26
	TJ	+8H	4.80	.45	.20
	JY	-8H	4.55	.58	.34
	YQ	+10H	4.95	.20	.04
	HD	_10H	4.82	.49	.24
	PC	+2V	2.04	.70	.49
	EF	-2V	2.51	.81	.66
	XN	+4V	3.08	.70	.49
	VT	-4V	3.46	.86	.75
	AL	+6V	4.08	.79	.62
	HK	-6V	4.11	.64	.41
WOMEN	UO	0	1.48	.54	.30
	FD	+2H	3.51	.58	.34
	DT	-2H	2.31	.79	.62
	ST	+4H	3.53	.81	.66
	DS	-4H	3.46	.91	.84
	NH	+6H	4.75	.57	.32
	LM	-6H	3.97	.72	.52
	WQ	+8H	4.97	.14	.02
	SH	-8H	4.84	.36	.13
	LR	+2V	2.84	.63	.40
	NN	-2V	3.35	.90	.82
	YR	+4V	4.46	.66	.43
	UA	-4V	4.40	.68	47

In men's profile: We found significant difference among 3 groups for horizontal chin changes also in 2 group comparisons except for orthodontists and lay

people. But analysis showed neither difference for vertical changes in 3 groups nor in 2 groups comparisons.

In women's profile: we found no significant difference in any comparisons.Men's profile raised difference among viewers of 3 groups and between omfs and orthodontists, omfs and lay people and specialists(omfs and orthodontists) and lay people.

In women's profile there were only significant differences between lay people and orthodontists and lay people and specialists.

In horizontal dimension of chin changes in 3 groups significant differences were found but no difference in vertical dimension.

In overall view; there were difference among findings of 3 groups . when comparing 2 groups , we did not find difference between omfs and orthodontists.(Table-2)

Age had significant affect on participants's answers, but sex and education were in effective. (Table-3)

Table 2: Different comparisons between groups
Colored numbers show significance using ANOVA or independent t-test.
*G1: orthodontists,**G2:oral and maxillofacial surgeons,***G3:lay people

	G1*,G2**	G1,G3***	G2,G3	G1,G2,G3	G1&G2,G3
Horizontal male	0.045	0.401	0.008	0.025	0.046
Vertical male	0.454	0.668	0.244	0.495	0.356
Horizontal female	0.848	0.125	0.318	0.236	0.091
Vertical female	0.951	0.192	0.275	0.295	0.119
Male	0.037	0.313	0.002	0.008	0.019
Female	0.939	0.047	0.141	0.075	0.023
Horizontal	0.176	0.102	0.007	0.014	0.009
Vertical	0.545	0.208	0.108	0.171	0.074
Total	0.135	0.036	0.001	0.002	0.001

Table 2: Effect of background factors using multiple regression logestics
Colored numbers show Significance

	Age	Gender	Education	Cosmetic surgery	Cosmetic surgery in family	orthosurgery	Orthosurgery in family	Beauty satisfaction	Beauty satisfaction of family	Need for cosmetic surgey
P Value	0.00	0.12	0.722	0.033	0.018	0.231	0.118	0.430	0.360	0.494

Discussion

In this study we tried to find the agreement level of 2 groups of dental specialists involved in improvement of facial esthetic with a group of lay people about the acceptable range of chin position in profile view in relation to normal upper face.

Silhouette images helped us to bypass the confounding factors such as make-up ,colors and hair; affecting observer's judgment . All participants were selected from the same cultural and ethnic origin in a single city to avoid the influence of cultural diversity.

All groups of observers preferred the original unchanged images. Since both photographs were derived from western references, it can be concluded that western or Caucasian normal faces are compatible with Iranian perception of acceptable norms. Fayaz,et al.[12] also showed compatibility of western and Iranian concept about normal facial profile.

We found that vertical changes of chin are less prone to make difference in observers. Romani[7] was in agreement with us but Tsang[13]found different results.

In this study all participants preferred convex profiles to concave ones and chose extremely convex and severely concave images as the worst.It seems that there is a concensus for two tails of this spectrum between all people. Tareja[11] in a study chose orthognathic profile as the best for Indian people; also Johnston[14] introduced normal proportioned profile as the most attractive from peopl's view. Romani et al.[7] proposed slightly convex profile as the best one. Mantzoks et al.[15] in a study selected the orthognathic profile as the least acceptable and Turkkaharman et al.[16] selected it as the most inappropriate. These variations mostly are the result of difference in culture and description of beauty in target populations.

In overall OMFSs and orthodontists were different in their perception with the lay people, but these 2 groups of specialists were in agreement with each other. It can be explained since dentists are more sensitive to esthetic elements of face because of their knowledge and training in this field. Between 2 groups of specialists , OMFSs rated the lowest scores. Abu Arghoub et al.[17] agreed with us but Almeida et al.[18] showed different results. Czamecki et al.[19] claimed two specialist group differ in their beauty perception.Also, it seems when silhouette is used the difference between groups is less.

Age do affect on participants's decisions but gender and educational level of lay people cannot influence on their perception about attractiveness. No need to say that dental educations can effect on perceptiont and attitude of people. Abu Arghoub[16] found that age has little effect on attractiveness. Luka cala[20]showed that age affects people's concept about beauty. Turkkaharman[15] concluded that age, gender, educations, social status, geographical area and personal characteristics can affect people's beauty preferences. Most researcher agree on the effect of age that can be explained based on increasing experiences and maturity of decision making by aging.

In case of cosmetic procedure, we showed that personal history can affect their concept by increasing their knowledge about beauty. But we and Luka cala[18] could not find any correlation between orthodontic or orthosurgery treatment with perception of beauty. Also we didn't find any effect of beauty satisfaction , need for esthetic surgery on people's concept.

In this study we had limitation about the number of professionals, however we involved all orthodontists and OMFSs in rasht.

Acknowledgement:

this investigation was based on a thesis submitted by the third author to the faculty of dentistry of Guilan University of Medical sciences(GUMS) in Iran, in partial fulfillment of the requirements for receiving Doctoral Degree.

We would like to thank our statistic consultant Dr. Ehsan Kazem nezhad Leili .Also we appreciate Mrs.Nastaran Mir farhadi from Oro-Maxillofacial Developmental Disease Research Center, for taking the time to prepare this paper. This work was

supported by grant from the research committee of GUMS,Rasht ,Iran.

Conclusions:

Present study showed that attractiveness preferences in all groups were the same but there were some differences in rating and sequencing images between specialists and other people that must be considered in proposing surgical treatments.

Age and history of cosmetic procedures are important factors that can change beauty perception.

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