

Soft tissue impingement and lip form in Iraqi teenagers

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ABSTRACT

Background: Soft tissue impingement and lip form have often been overlooked in previous epidemiological surveys.

Materials and Methods: About seven thousand 13 year olds with no history of orthodontic treatment were selected from six governorates (Baghdad the capital, Ninevah, Basrah, Diyala, Anbar and Najaf). An intra-oral clinical examination was used to assess traumatic overbite causing soft tissue impingement and the lip form of each student.

Results: Soft tissue impingement was found in 2.7% (2.5% palatally and 0.2% labially). Normal lip form was found in 80.7%, contracting lip form in 14.7% and lip trap in 4.6% of the sample. All the previous were non-significantly related to gender and residency.

Conclusion: Iraqi children present a much more favorable lip form than Western children.

Keywords: Soft tissue, impingement, lip form (J Coll Dentistry 2005; 17(2):80-83)

INTRODUCTION

Deep traumatic overbite may lead to gingival recession, looseness of the teeth and periodontal problems ⁽¹⁾. This trauma commonly happens on the palatal soft tissue in class II division 1 malocclusion and can happen both on the palate and the labial gingiva of the mandibular incisors in class II division 2 malocclusion. Some studies dealing with soft tissue impingement as a result of deep traumatic overbite are summarized in table 1.

The concept of the effect of soft tissues on the occlusal development is by no means new. Desirabode in 1847 described the lips as one of the factors controlling incisors positions ⁽²⁾. The lip form has been assessed by various methods of which are:

1- Clinical: More than one method for clinical lip assessment were described:

- a) Assessment of the vertical form of the lips classifying them into competent and incompetent ⁽⁴⁻⁶⁾. Jones and Oliver ⁽⁶⁾ defined lips as competent, potentially competent and incompetent lips.
- b) Foster and Day ⁽⁴⁾ classified lip form into normal, contracting and lip trap.
- c) Haynes ⁽⁷⁾ classified the lower lip position into five types and each type was correlated with an overjet range.
- d) Direct anthropometric measurement consisting of measuring certain landmarks on the subject's skin ⁽⁸⁾.

2- Electromyography to record perioral muscular activity during rest and function.

3- Intraoral sensors cemented directly on the teeth to measure the pressure exerted by lips.

4- Cephalometric measurements to assess lip profile including Schwarz, Ricketts, Steiner's and Holdaway's lip analyses ⁽⁹⁾.

The results of some studies on lip form are listed in table 2.

MATERIALS AND METHODS

The sample included a total of 7176 intermediate school students 13 years of age. These students were taken from 6 governorates (cities and environs) in Iraq selected to cover the whole country geographically (Baghdad the capital, Ninevah, Basrah, Diyala, Anbar and Najaf) according to a multi-stage stratified sampling technique. Details of the geographic distribution and sampling technique are given in Al-Huwaizi ⁽¹⁰⁾.

After excluding the invalid case sheets and isolating the students with some sort of orthodontic treatment, the number of casesheets which entered the statistical analysis dropped to 6957 ⁽¹¹⁻¹²⁾.

Soft tissue impingement

The sole assessment of the soft tissue was made in the region of the occlusion of the four maxillary and four mandibular incisors. A record was made of any occlusal palatal impingement due to the mandibular incisors, or any mandibular labial impingement due to the maxillary incisors ⁽¹³⁾.

Lip form

The lips were categorized according to Foster and Day ⁽⁴⁾ as:

(1) Assistant Professor at the Department of Orthodontics, College of Dentistry, University of Baghdad.

(2) Professor and Chairmen of the Department of Orthodontics, College of Dentistry, University of Baghdad.

(3) Professor at the Department of Pedodontics and Prevention, College of Dentistry, University of Baghdad.

1. Normal: Lips meet in front of the maxillary incisors in the relaxed posture without circumoral contraction.
2. Contracting: Lips which because of their shape or size, can only meet in front of the maxillary incisors with contraction of the circumoral musculature.
3. Lip trap: The lower lip rests or contracts completely or partly behind the maxillary incisors (Fig. 1).



Figure 1: Patient in rest position showing lower lip resting behind the maxillary incisors

Statistical analysis

Chi square test was used to assess the association between soft tissue impingement and lip form on one side and gender, urban and rural, and governorates on the other side.

P levels of more than 5% were regarded as statistically insignificant

Table 1: Reported prevalences of tissue impingement (traumatic overbite).

Author	Sample			Results	
	Country	Size	Age	Labial	Palatal
Kelly et al. ⁽²¹⁾	American White		6-11	4.6%	
	American Blacks			1.2%	
Kelly & Harvey ⁽²⁰⁾	American White		12-17	1.0%	
	American Blacks			0.3%	
Cons et al. ⁽¹⁸⁾	America	1337	15-18	0.2%	6.7%
Kinaan ⁽¹⁹⁾	Iraq	250	11-12	1.2%	
	England	236		6.3%	
Farah ⁽²²⁾	Iraq	101	9-10	1%	
Hill ⁽¹⁴⁾	Scotland	765	9	3%	
			12	3%	
			15	2.7%	
Abdulla ⁽¹⁵⁾	Iraq	200	13	0%	3.5%
			15	0.5%	4%
			17	0%	5.5%
Batayine ⁽¹⁶⁾	Jordan	200	13	1%	2.5%
			15	1%	3%
			17	0.5%	4%
Al-Dailami ⁽¹⁷⁾	Yemen	400	10-12	0%	3%
			13-15	0.75%	2.5%

Table 2: Reported prevalences of lip form.

Author	Sample			Lip form		
	Country	Size	Age	Normal	Contracting	Trap
Foster & Day ⁽⁴⁾	England	1000	11-12	63.2	14.8	22
Abdulla ⁽¹⁵⁾	Iraq	200	13	74.5	21.5	4
		200	15	72.5	26.5	1
		200	17	81	18.5	0.5
Batayine ⁽¹⁶⁾	Jordan	200	13	76	21	3
		200	15	73.5	25	1.5
		200	17	80	19	1
Al-Dailami ⁽¹⁷⁾	Yemen	400	10-12	71.25	26.5	2.25
		400	13-15	71.75	26	2.25

RESULTS AND DISCUSSION

Soft tissue impingement

Of the sample 2.5% had palatal soft tissue impingement, 0.2% had labial soft tissue impingement (Table 3). The prevalence of palatal soft tissue impingement was similar to that found by others⁽¹⁴⁻¹⁷⁾, but it was much less than that found by Cons et al.⁽¹⁸⁾ on Americans and Kinaan⁽¹⁹⁾ on English children and much higher than that of Kelly and Harvey⁽²⁰⁾ and Kinaan⁽¹⁹⁾ on Iraqi children (Table 1). These differences may be attributed to differences in defining soft tissue impingement and the subjectivity in deciding it during examination.

The distribution of soft tissue impingement by traumatic overbite in the six examined governorates was statistically insignificant both palatally ($X^2=1.539$, d.f.=5, NS) and labially ($X^2=3.434$, d.f.=5, NS) as shown in table 3.

Considering gender difference, soft tissue impingement was statistically insignificantly distributed between both genders and between urbans and rurals both palatally and labially (Table 4 and 5).

Lip form

Of the sample, 80.7% had a normal lip form, 14.7% had a contracting lip form and 4.6% had lip trap (Table 6). The prevalence of contracting lips was very similar to the one of Foster and Day⁽⁴⁾ but smaller than those of others⁽¹⁵⁻¹⁷⁾. On the hand, the prevalence of lip trap was very similar to that of Abdulla⁽¹⁵⁾ and higher than

those of Batayine⁽¹⁶⁾ and Al-Dailami⁽¹⁷⁾ but remarkably smaller than that of Foster and Day⁽⁴⁾ as shown in table 2.

The reason for this noticeable difference from the findings of Foster and Day⁽⁴⁾ is the much higher prevalence of class II malocclusion in this English sample than that found in the present sample.

Contracting lips were highest in Diyala (19.9%) and lowest in Najaf (12.9%). Lip trap was also highest in Diyala (5.4%) and lowest in Najaf (3.5%). The distribution of lip form in the six examined governorates was statistically significant ($X^2=34.389$, d.f.=10, $p<0.001$) as shown in table 6. This is in coincidence with the previous finding that Diyala showed the highest overjet and Najaf showed the least overjet value⁽²³⁾.

Considering gender, lip form was statistically insignificantly distributed between both genders for the urbans ($X^2=1.202$, d.f.=2, NS), rurals ($X^2=2.297$, d.f.=2, NS) and total sample ($X^2=0.113$, d.f.=2, NS) as shown in table 7. This came in agreement with the findings of Al-Dailami⁽¹⁷⁾.

Lip form was also statistically insignificantly distributed between urbans and rurals for the males ($X^2=0.559$, d.f.=2, NS), females ($X^2=3.517$, d.f.=2, NS) and total sample ($X^2=0.694$, d.f.=2, NS) as shown in table 7.

Table 3: Distribution (%) of the soft tissue impingement according to type by governorate.

Type	Baghdad N=1995	Ninevah N=991	Basrah N=989	Diyala N=994	Anbar N=995	Najaf N=993	Total N=6957
Palatal	2.6	2.4	2.1	2.3	2.6	2.9	2.5
Labial	0.2	0.2	0.1	0.1	0.2	0.4	0.2

Table 4: Distribution (%) of the soft tissue impingement according to type by residency and gender.

Type	Urban			Rural			Total		
	Male N=1739	Female N=1744	Total N=3483	Male N=1738	Female N=1736	Total N=3474	Male N=3477	Female N=3480	Total N=6957
Palatal	2.6	2.2	2.4	2.8	2.4	2.6	2.7	2.3	2.5
Labial	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2

Table 5: Chi square tests between both genders and residencies (urban and rural) for soft tissue impingement.

Location	Chi square	Gender difference			Residency difference		
		Urban	Rural	Total	Male	Female	Total
Palatal	X ²	0.451	0.408	1.008	0.010	0.018	0.061
	p level	NS	NS	NS	NS	NS	NS
Labial	X ²	0.000	0.166	0.310	0.125	0.000	0.000
	p level	NS	NS	NS	NS	NS	NS

Table 6: Distribution (%) of lip form according to type by governorate.

Type	Baghdad N=1995	Ninevah N=991	Basrah N=989	Diyala N=994	Anbar N=995	Najaf N=993	Total N=6957
Normal	81.3	82.3	81.8	74.6	79.9	83.6	80.7
Contract	14.2	13.0	13.5	19.9	15.2	12.9	14.7
Trap	4.5	4.6	4.7	5.4	4.9	3.5	4.6
Total	100	100	100	100	100	100	100

Table 7: Distribution (%) of lip form according to type by residency and gender.

Type	Urban			Rural			Total		
	Male N=1739	Female N=1744	Total N=3483	Male N=1738	Female N=1736	Total N=3474	Male N=3477	Female N=3480	Total N=6957
Normal	80.4	81.2	80.8	81.1	80.1	80.6	80.8	80.6	80.7
Contract	14.8	14.8	14.8	14.7	14.6	14.6	14.7	14.7	14.7
Trap	4.8	4.0	4.4	4.3	5.4	4.8	4.5	4.7	4.6
Total	100	100	100	100	100	100	100	100	100

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