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Research Article

Determination of Mandibular Asymmetric Prevalence in Panoramic Radiography in Children Aged 7 to 12 Years Old Referred to Radiology Department of Islamic Azad University in 2014-2015 Academic Year

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ABSTRACT
Introduction and goal: All normal faces have degrees of asymmetry, but asymmetry is important in most dental branches due to functional psychological and emotional effects. In addition, due to the common use of panoramic radiography by dentists and specialists, the aim of this study was to determine the prevalence of mandibular asymmetry in children aged 7 to 12 years who referred to Radiology Department of Islamic Azad University in 2014-2015 academic year.
materials and methods: In this descriptive study, panoramic radiographs were selected from children aged 7-12 years who were referred to Islamic Azad University without trauma history, congenital craniofacial disease and orthodontic treatment. In order to evaluate the asymmetric mandible, height and length of rhomus, height and width of the trunk and gonial and conodular angles were evaluated by Autodesk Design Review. To determine the asymmetric intensity, for each of the indicators, the asymmetric index (AI) was calculated and classified into four categories.
In this study, in addition to the skeletal asymmetric, asymmetry in second molar teeth was investigated by Dimirjian method. In order to compare the values of the two sides, used the paired T test, and to investigate the effect of different effects on the asymmetric members, we used the linear regression equation.
Results: In the analyzed samples, the average of all indicators on the left was more than right. Of the 972 measured indexes, 71% were within the Non-Significant range, 22% were in the Low range, and 7% in the Medium range. Meanwhile, the highest degree of symmetry belonged to the Ramos height (79% of the samples) and the lowest symmetry, was related to the gonial angle (48% of the samples). 11-year-old children had the highest symmetry and 9-year-old children had the least symmetry. examine indexes asymmetric showed that asymmetric relationship was not significant with age and sex. In the studied cages, out of 81 samples, the second mandibular molar was 75 samples (92.5%) in both directions in terms of growth and evolution in one stage.
Conclusion: According to the results of this study, in the Iranian society, the asymmetry of the mandible was not common and 93% of the indicators were in the asymmetric and least symmetric range, and orthodontic specialists and other fields, with regarding to the preservation and restoration of the teeth, maintaining the missing teeth space and other factors leading to asymmetry,can prevent Non-hereditary asymmetry.

Keywords: Asymmetric, Mandibular, Outbreak, Panoramic radiography, Dental asymmetry, Bony

INTRODUCTION:

The presence of asymmetric mandible in children is one of the most important issues that is discussed in most branches of dentistry. The asymmetric mandibular can be congenital, evolutionary, or acquired (1). Asymmetry between the mandibular sides may be due to mandible adaptive responses to deviations during functionality that cause the modeling of the condyles and gonovaidophosa (2 and 1), as well as the modeling and remodeling of the mandible bone (1, 3). Currently, submento-vertical radiographs and posteroanterior radiograph (4), photogramography (5), panoramic radiography (6 and 7) and cbct (8) are used to determine the lower jaw asymmetric. The benefits of panoramic radiography, which cbct lacks, can be seen in the simplest and least costly, common, lower doses, and the placement of two sides of the mandible in a small magnification view (8). The side effects of asymmetry can be attributed to adverse effects on the duration and outcome of orthodontic treatment. Early and timely diagnosis provides a better prognosis for the disease, so that, if necessary, it can be used in the choice of treatment and early treatment (1). German and colleagues in 2010 conducted a study entitled "Prevalence of mandibular asymmetries in growing patients" to determine the extent of mandible asymmetry during the period of mixed dentition in Growing children. In this study, in comparison to the longitudinal border measurement on both sides of the mandible, in more than half of the samples were found to have a moderate to severe mandibular asymmetry. Also, when comparing Go and Co angles on both sides of the jaw, there was a high prevalence of moderate and severe asymmetric. There was a difference in the growth stage of the permanent second molar teeth between the two sides and there was a high prevalence of asymmetric in the mandibular shape of the population (1). Lemos and colleagues in 2014 conducted a study titled mandibular asymmetry: A Proposal for Radiographic Analysis with Public Domain Software to provide a new analysis of digital panoramic radiography for a differential diagnosis of functional and morphological lower jaw asymmetry in children with and without cross-bypass posterior unilateral. In this study, there was a significant difference between the two right and left sides in measuring the length and position of the condyles in patients with posterior lateral mandibular cross-section compared to those with normal occlusion. Although diagnostic methods are more effective and more accurate, but panoramic radiography is still common, especially in developing countries.Early evidence and analysis of this study, which can be an important source for planning in early orthodontic intervention, thereby preventing asymmetric progression and their outcomes (9). However, in Iran, the prevalence and severity of mandibular asymmetry in the period of mixed dentition have not been studied extensively. Due to the contradiction and information gap in this regard, we decided to check out the prevalence of mandibular asymmetric prevalence in children ages 7 to 12 years by panoramic radiography at dental school Islamic Azad University of Tehran in 2015-2016

MATERIALS AND METHODS:

This research was a cross-sectional study. All of the panoramic stereotypes of patients aged 7 to 12 years who referred to Radiology Department of Islamic Azad University in 2015-2016 academic year, were studied. Sample size with respect to the results of the German study using the formula $\underline{P(1-p) \times^2_{1-\alpha/2} Zn} =$ Considering $\alpha = 0.05$, $P = 0.7$, $d = 0.1$ At least 81 people calculated(1).

The sampling method was based on the objective and continued sequential to referral to the Radiology Department of the Islamic Azad University and the time to reach the required number of samples. Dental records were selected from 81 children with traumatic history, congenital coronavigious disease and orthodontic treatment. All radiographs were prepared with

VILLA EVO PANORAMIC radiography and settings of 66KV 7mA 14.4s.

No panoramic radiographs without artifact, in which all the mandible was fully and sufficiently inverted, and the patient's patient did not rotate up and down or left or right during radiography, was selected to perform the measurements.

Radiographs were evaluated in a variety of measurements (Dimensions of the lower jaw and mandibular angle) and an individual assessment (the growth and evolution of low molars). Linear and angular measurements were performed by using Autodesk software. Linear measurements performed on both sides of the jaw were: Ramos height, Ramos width, trunk height and trunk height. Gonial and Candillary angles were also reviewed. In order to estimate the observer error, eight radiographic stereotypes were reviewed again two weeks later. Mesodistal length of the first permanent molar teeth was measured in the casts of the study models and compared to the size of the same teeth on the radiographs, Then, we measured the size of the casts divided by the size of the tooth in the radiograph and the resulting number for each side was crossed. (1) For each of the measurements, AI was calculated for determination of the intensity of the asymmetry, and the results were classified into four NS groups (unspecified) L (low), M (moderate), S (severe). (1) In order to compare the values of the two sides, the paired T test was used and the effect of different factors on the asymmetric values was used from the linear regression equation.

FINDINGS:

According to the results of this study, out of 81 stereotypes of panoramic radiography, 40 (49.38%) of the samples were boys and 41 (50.62%) were girls in the age groups of 7 years old (15%), 8 years (15%), 9 years (18%) 10 years old (15%), 11 years old (17%), 12 years old (20%) and middle age (9.6%). In the stereotypes examined, the mean height and width of the ramus, the width and height of the trunk and the angles of gonial and mandrel (all indices) to the left side were more than the right. The data is presented in Table 1.

Table 1: Mean and standard deviation Dimensions of indicators: Ramos height, Ramos width, trunk height, trunk width, gonial angle and conical angles in both mandibular both sides in all specimens.

Difference between two sides mean±SD	Left side mean±SD	right side mean±SD	
0.987±0.059	34.293±3.617	33.306±3.558	Ramos Heights
0.608±0.042	24.840±2.129	24.232±2.171	Ramos width
0.483±0.19	22.271±2.172	21.788±2.362	Trunk height
2.162±0.329	68.802±4.380	66.645±4.051	Trunk width
0.27±0.29	127.592±5.902	127.086±5.612	Gonial angle
0.617±0.94	114.617±5.297	114±5.203	Condylla angle

Of the 972 indexes measured, 71% were within the range of NS, 22% in the range of L, and 7% in the M range, with the highest degree of symmetry belonging to the Ramos height (79% of the samples) and the lowest degree of symmetry belonging to the Gonial angle (48% of the samples).

Table 2: shows the frequency of different levels of asymmetric levels of skeletal indicators in different ages.

P test result	Total (Percent) number	***12*** (Percent) number	***11*** (Percent) number	***10*** (Percent) number	***9*** (Percent) number	***8*** (Percent) number	***7*** (Percent) number	Age Severity	Indicator
	64(79%)	13(81.25%)	13(93%)	11(92%)	8(53.3%)	9(75%)	10(83%)	NS	Ramos Heights
	12 (15%)	1(6.25%)	1(7%)	1(8%)	5(33.3%)	2(17%)	2(17%)	L	
	5 (6%)	2(12.5%)	0	0	2(13.3%)	1(8%)	0	M	
	0	0	0	0	0	0	0	S	
	57(70%)	13(81.25%)	13(93%)	8(67%)	7(46.6%)	6(50%)	10(83%)	NS	Ramos

	16(20%)	2(12.5%)	1(7%)	3(25%)	4(26.6%)	4(33%)	2(17%)	L	width
	8(10%)	1(6.25%)	0	1(8%)	4(26.6%)	2(17%)	0	M	
	0	0	0	0	0	0	0	S	
	58 (72%)	13(81.25%)	9(64%)	9(75%)	9(60%)	7(58%)	11(92%)	NS	
	18(22%)	2(12.5%)	4(29%)	2(17%)	5(33.3%)	4(33%)	1(8%)	L	Trunk height
■	5(6%)	1(6.25%)	1(7%)	1(8%)	1(6.6%)	1(8%)	0	M	
	0	0	0	0	0	0	0	S	
P 0.05	56(69%)	12(75%)	14(100%)	7(58%)	9(60%)	4(33%)	10(83%)	NS	
	18 (22%)	3(19%)	0	3(25%)	3(20%)	8(67%)	1(8.5%)	L	Trunk width
	7(9%)	1(6%)	0	2(17%)	3(20%)	0	1 (8.5%)	M	
	0	0	0	0	0	0	0	S	
	48 (59%)	13 (81%)	6(43%)	8(67%)	6(40%)	6(50%)	9(75%)	NS	
	26(32%)	3(19%)	3(21%)	4(33%)	9(60%)	6(50%)	1(8%)	L	Gonial angle
	7(9%)	0	5(36%)	0	0	0	2(17%)	M	
	0	0	0	0	0	0	0	S	
	62(77%)	12(75%)	13(93%)	7(58%)	12(80%)	11(92%)	7(58%)	NS	
	18(22%)	4(25%)	1(7%)	5(42%)	2(13.3%)	1(8%)	5(42%)	L	Condylla angle
	1 (1%)	0	0	0	1(6.6%)	0	0	M	
	0	0	0	0	0	0	0	S	

The asymmetric index for any of the samples was not severe. In general, the asymmetric index did not show significant differences between different age groups. In the relationship between asymmetry and gender, the greatest difference was the condyle angle and the smallest difference was in the Ramos width.

Of the 81 samples, in 75 samples (92.5%), the second mandibular molar was in two sides in terms of growth and evolution in one stage, the difference in 5 samples (6.17%) was one stage, and in one sample (23.1%), the difference was on two sides of two stages.

DISCUSSION AND CONCLUSION:

This cross-sectional study was conducted to evaluate the prevalence of mandibular asymmetry and the frequency of molar teeth irregularity in panoramic radiography in 7-12 year-old children referred to Radiology Department of Islamic Azad University in the academic year 2015-2016.

In previous studies, different techniques have been used to investigate asymmetry. Suk-Ja Yoon (10) and Paniagua (11) from CBCT, Dalili and colleagues (12) of the posterior-anterior cephalometry, panoramic, and tomography of Condyle and Taghavi and colleagues (13), Anterior-posterior radiography alone and Sop et al. (14) used lateral cephalometry to diagnose asymmetric mandibular.While German (1), Kambylafkas (7), Biagi (15), Lemos (16), Sezgin (17) and Uysal (18) have used panoramic radiographs as our study. In this research, panoramic digital radiography was used to determine the mandible asymmetry. In our study, there was no significant relationship between asymmetry with age and sex. According to a study conducted by Uysal et al. (18), Kasimoglu et al. (19) and Sezgina et al. (17), for patients with different occlusion, the relationship There was no statistically significant relationship between asymmetry and age and sex.

Some researchers in the past believed that the asymmetry of mandibular dimensions of less than 2-3mm may affect the appearance of the face, while some people considered 4-5mm as a range for natural asymmetry of the face (1). In this study, considered the difference of 3 -5mm between the two sides of the middle asymmetric and the difference of more than 5mm is intense asymmetric.In Ghasemianpour and colleagues research on high school students in Tehran, about half of the girls and boys had at least one asymmetric type, and mandibular asymmetry was reported more in boys than in girls, and in 62.5% of cases with skeletal asymmetry, chin was distracted the right. (20).According to a study by Biagi et al. (15), in most of the indexes, the

asymmetry was low, and Ramos height in the NS region and mandibular width were the highest among the indexes, and in the aggregate, the mean of the left indices was greater than right, as in our study, this difference was not significant. According to German and colleagues (1), there was a statistically significant difference between all the asymmetric indexes of the mandible in two left and right sides, the mean left gonial angle was larger than the right, and the mean angle of the right condyle was larger than the left. In each of the four Asymmetric Linear Indicators, the mean left side size was greater than the right, and more than 50% of the asymmetric cases were M and S. In the current study, the mean of all asymmetric (linear and angular) indexes on the left side was larger than the right, but most of the asymmetric indexes were within the range of NS and L. Based on the present study findings, the larger right side of the face cannot be generalized. These results clearly indicate that the left mandibular dimensions are larger than the right side.According to a study by German (1) et al., The difference between vertical indexes was more than horizontal. While in the current study, the difference between the horizontal indicators was higher than the vertical ones.

In the present study, in 92.5% of the samples, there was no significant difference between the mandibular molars in both directions In terms of the level of evolution. In the study of German and colleagues, which was performed on 327 samples, 96% had no difference (1) and the results of two studies were close. The strengths of this study were that in this study, 81 samples and 972 bone indexes and 162 dental indexes were performed, while similar studies included few patients and indicators.Overall, according to the results of this study, in the Iranian society, indeterminate mandibular asymmetry was not common and 93% of the indicators were in the asymmetric and least asymmetrical range, and orthodontists and other disciplines, with regard to the preservation and restoration of teeth, the maintenance of missing teeth space and other factors leading to asymmetry, can prevent the creation of Non-hereditary asymmetric. The asymmetry of the tooth was also uncommon, and both side mandibular second molar was in one stage in 92.5% of the specimens. In addition, there was no statistically significant relationship between asymmetric, age and sex.

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