LETTER TO THE EDITOR
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Palatal Arch Diameters of Patients with Allergic Rhinitis

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ABSTRACT

The purpose of this study was to evaluate the transverse and vertical dimensions of the palate of children with allergic rhinitis (AR). There was no significant difference for intermolar and intercanine distances between two groups in primary and mixed dentitions. Palate depth in children with allergic rhinitis was statistically more than in children without any respiratory disease. Cross bite was more prevalent in study group. It seems that the main influence of alteration of breathing pattern from nasal to mouth occurs on the vertical plane.

Key word: Allergic rhinitis; Children; Palate

LETTER

Children with severe allergic rhinitis often have facial manifestations of itching and obstructed breathing, including a gaping mouth, chapped lips, obstructive sleep apnea, mouth breathing, a long face, dental malocclusion, and the allergic shiner, allergic salute, or allergic crease.¹ The effect of mouth breathing on craniofacial growth and development still has remained controversial. Clearly, this is a multi-factorial process that involves both genetic and environmental influences.²

Proffit and Fields believe that increased pressure from the stretched cheeks might cause a narrower maxillary dental arch.³

Others stated that allergic rhinitis with mouth breathing can cause malocclusions such as posterior crossbite, gothic palate and retro inclinable incisors.⁴ ⁵

Despite these statements, Warren believed that nasal airway blockage could not cause serious oro facial disorders.⁵ The aim of this study was to compare the transverse and vertical dimension of the palate of children with allergic rhinitis and compare them with children without any respiratory disease.

The sample consisted of 100 children of both sexes, aged between 3 and 12, 44 in primary and 56 in mixed dentition. Informed written consent for the study was given by the parents. Diagnosis of allergic rhinitis based on clinical history, clinical examination by the allergist in specialist office (eosinophil in nasal smear and skin test), and history of mouth breathing, nocturnal snoring and frequent colds was also confirmed by parents.

The exclusion criteria were: history of a sucking habits after 3 years of age, any hereditary or acquired facial deformation, history or suggestion of surgery for adenoid hypertrophy, interproximal caries and missing teeth, polyps and nasal septum deviation on rhinoscopy. Personal details and a history of allergic problems were obtained through a questionnaire from the parents.

A three dimensional korkhaus compass with high reliability and exactitude on 0.5 mm was used to measure the palate,² allowing measurements on three planes: anteroposterior, vertical and transverse.

The ages of the children involved in the sample were between 3 and 12 (Mean± SD= 7.1±2.42) 44% were in primary dentition and 56% were in mixed dentition phase. Sex distribution was not a significant difference between two groups. There was only significant difference in palate depth (Table 1) (P<0.05). There were no significant differences for intermolar distance in boys but differences in intercanine and palate depth in boys were statistically significant (P<0.05). There was significant difference only on palatal depth in girls in two groups (P=0.03). Crossbite in case group was more prevalent than that of the control group (P=0.003).

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Table 1. Dimensions of palate in case and control groups in primary and mixed dentition.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary-case</td>
<td>15</td>
<td>29.66</td>
<td>2.17</td>
<td>0.451</td>
</tr>
<tr>
<td></td>
<td>Primary-control</td>
<td>29</td>
<td>29.58</td>
<td>1.78</td>
<td></td>
</tr>
<tr>
<td>Intermolar distance (mm)</td>
<td>Mixed-case</td>
<td>35</td>
<td>31.97</td>
<td>3.19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed-control</td>
<td>21</td>
<td>32.21</td>
<td>2.43</td>
<td>0.375</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary-case</td>
<td>15</td>
<td>23.7</td>
<td>2.14</td>
<td>0.263</td>
</tr>
<tr>
<td>Intercanine distance (mm)</td>
<td>Primary-control</td>
<td>29</td>
<td>23.31</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed-case</td>
<td>35</td>
<td>24.91</td>
<td>2.71</td>
<td>0.479</td>
</tr>
<tr>
<td></td>
<td>Mixed-control</td>
<td>21</td>
<td>24.88</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Depth of palate (mm)</td>
<td>Primary-case</td>
<td>15</td>
<td>10.83</td>
<td>1.15</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>Primary-control</td>
<td>29</td>
<td>10.2</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed-case</td>
<td>35</td>
<td>12.24</td>
<td>1.83</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Mixed-control</td>
<td>21</td>
<td>11</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

The average intermolar and intercanine distances evaluated indicated no significant differences between the case and control groups, in the primary and mixed dentition. This result agrees with Trask’s (1987) and De freita’s (2001), Subtelny’s (1954) studies. It seems that mouth breathing can not significantly influence the transverse dimension of palate. Subtelney (1954) considered that the narrowing of the upper arch in the mouth breathers would lead to an optical illusion that could suggest a greater palate depth in this group.7

In this study, significantly deeper palate without narrowing in the upper arch was seen in children with allergic rhinitis. The result agrees with those of Bresolin (1983), Trasks and et al, and Defretas et al studies.2,6,8

Some authors suggest that mouth breathing increases pressure in the oral cavity as well as the nasal cavity which could explain the greater palate depth in this group of allergic patients, but others believe that patients with a genetic tendency to vertical growth and a deeper palate are more likely to develop mouth breathing.2

There was a statistically significant difference between crossbite case and control groups. Venetikidou showed a significant relationship between frequency of crossbites and mouth breathing.9,10 When transverse dimension of palate decreased, crossbite occurred.

Controlled longitudinal studies to analyze a possible cause-and-effect relationship should be undertaken.

REFERENCES