Allergic Rhinitis and Oral Malocclusion in Children

Claudia I. Gallego Corella, MD
Allergic Rhinitis

- The 4 cardinal symptoms of nasal reaction to occur in response to allergy are:
  - Sneezing
  - Runny nose / back
  - Nasal obstruction
  - Nasal itching

Obstruction of upper airway

The oral breathing syndrome occurs when the patient substitutes the correct pattern of breathing due to nasal obstruction *

ARIA 2008 Update. Allergy 2008: 63 (Suppl. 86): 8–160
MOTONAGA et al. (2000)

- Investigated the causes and alterations in the stomatognathic system of oral breathing children and concluded that *allergic rhinitis* was among the most frequent causes.
Prevalence of oral breathing

- **Variability between studies from 5% to 75%**

Frecuencia de malos hábitos orales y su asociación con el desarrollo de anomalías dentomaxilares en niños de 3 a 6 años en el área oriente de Santiago. Agurto P, et al. Rev. Chil. Pediatr. V.70 n.6 nov. 1999


Treviño-Salinas, Muñoz-Mendoza, González-Díaz, Arias-Cruz, Chapa-Rodríguez, Rodríguez-Ortiz. Prevalencia de respiración oral y su efecto en el desempeño escolar en niños con alergia respiratoria. Medicina Universitaria 2009;11(42):17-21
Categorization of patients with allergic rhinitis: a comparative profile of “sneezers and runners” and “blockers”

Puneet Khanna, MD, and Ashok Shah, MD

Table 1. Comparative Clinical Profile of “Sneezers and Runners” and “Blockers”

<table>
<thead>
<tr>
<th>Variable</th>
<th>“Sneezers and runners”</th>
<th>“Blockers”</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients</td>
<td>72 (63)</td>
<td>42 (37)</td>
<td>114</td>
</tr>
<tr>
<td>Male</td>
<td>40 (56)</td>
<td>23 (55)</td>
<td>63 (55)</td>
</tr>
<tr>
<td>Female</td>
<td>32 (44)</td>
<td>19 (45)</td>
<td>51 (45)</td>
</tr>
<tr>
<td>Mean age, y</td>
<td>24.3</td>
<td>28.2</td>
<td>25.7</td>
</tr>
<tr>
<td>Mean age at onset, y</td>
<td>15.4</td>
<td>19.7</td>
<td>17</td>
</tr>
<tr>
<td>Age at onset of disease &lt; 20 y</td>
<td>65 (90)†</td>
<td>19 (45)</td>
<td>84 (74)</td>
</tr>
<tr>
<td>First born</td>
<td>29 (40)</td>
<td>14 (33)</td>
<td>43 (38)</td>
</tr>
<tr>
<td>Born between June and September</td>
<td>44 (61)†</td>
<td>11 (26)</td>
<td>55 (48)</td>
</tr>
<tr>
<td>Family history of atopy</td>
<td>63 (88)†</td>
<td>18 (43)</td>
<td>81 (71)</td>
</tr>
<tr>
<td>Eye itching</td>
<td>65 (90)†</td>
<td>15 (36)</td>
<td>80 (70)</td>
</tr>
<tr>
<td>Throat and palate itching</td>
<td>48 (67)†</td>
<td>13 (31)</td>
<td>61 (54)</td>
</tr>
<tr>
<td>Ear itching</td>
<td>31 (43)†</td>
<td>7 (17)</td>
<td>38 (33)</td>
</tr>
<tr>
<td>Skin itching</td>
<td>19 (26)†</td>
<td>3 (7)</td>
<td>22 (19)</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>35 (49)</td>
<td>38 (90)†</td>
<td>73 (64)</td>
</tr>
<tr>
<td><strong>Mouth breathing</strong></td>
<td>31 (43)</td>
<td>34 (81)†</td>
<td>65 (57)</td>
</tr>
<tr>
<td>Prior nasal surgery</td>
<td>6 (8)</td>
<td>13 (31)†</td>
<td>19 (17)</td>
</tr>
<tr>
<td>Loss of sense of smell</td>
<td>10 (14)</td>
<td>15 (36)†</td>
<td>25 (22)</td>
</tr>
<tr>
<td>Affected by dust</td>
<td>67 (93)†</td>
<td>20 (48)</td>
<td>87 (76)</td>
</tr>
<tr>
<td>Affected by vehicular smoke</td>
<td>62 (86)</td>
<td>31 (74)</td>
<td>93 (82)</td>
</tr>
<tr>
<td>Food or drug allergy</td>
<td>9 (13)</td>
<td>3 (7)</td>
<td>12 (11)</td>
</tr>
<tr>
<td>Exposure to ETS</td>
<td>30 (42)</td>
<td>21 (50)</td>
<td>51 (45)</td>
</tr>
<tr>
<td>Affected by ETS</td>
<td>24/30 (80)</td>
<td>15/21 (71)</td>
<td>39/51 (76)</td>
</tr>
<tr>
<td>GERD</td>
<td>24 (33)</td>
<td>19 (45)</td>
<td>43 (38)</td>
</tr>
<tr>
<td>Psychological factors</td>
<td>9 (21)</td>
<td>5 (7)</td>
<td>14 (12)</td>
</tr>
</tbody>
</table>
Prevalence of malocclusion among mouth breathing children: Do expectations meet reality?

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401 patients
2 to 12 y
Evaluated by otolaryngologist allergist, orthodontist
Presence of oral breathing malocclusion

Adenoidal hypertrophy c / s RA: 71%
AR: 18%
Non-obstructive mouth breathing: 9.5%
Posterior crossbite: 48%
Malocclusion: 46%
Children allergic rhinitis

They have a high frequency of oral breathing

Presence of alterations dentomaxilofaciales

Mouth breathing and its effect on the morphology dentomaxilofaciale

- Downward position or low tongue
- Lose internal support for tooth
- Lack of transverse development of the jaw (maxilla compression)
- Lack of shaping of the palate
- Contraction of the palate (high arched)
- The oral musculature rests unopposed
- Alteration occipito-cervical angle (posture of the head extended back)

Figura 1. Esquema del atumiento del resalte.
Maxillofacial development impact

- Hypoplastic maxilla
- Maxillary sinus hypodevelopment
- Constriction of the upper dental arch (high palate)
- Neuromuscular disorders
- Lack of transverse development of maxillary
- Incisive protrusion and/or crowding
- Mandibular prognathism
- Increase in lower facial height
Clinical features in a patient oral oral breathing

Mouth breathing: Adverse effects on facial growth, health, academics, and behavior
By Yosh Jefferson, DMD, MAGD Featured in General Dentistry, January/February 2010 Pg. 18-25
Bresolin et al.

The nasal airway obstruction with oral respiration during critical periods of growth in children produces a disproportionate increase in lower vertical facial height.

- Allergic children with mouth breathing have a long, narrow facies accompanied by retrognathia when compared with controls.
Craniocervical posture and hyoid bone position in children with mild and moderate asthma and mouth breathing

Results:

- The craniovertebral angle (CVA) was found to be significantly lower in asthma than in control children (106 vs 111, P=0.02).
- The hyoid absent or reversed triangle was found to be significantly higher (36% vs 7%, p = 0.0001).
Lip incompetence and psychosocial effects: A pilot study

Atypical streptococcal infection of gingiva associated with chronic mouth breathing
Haytac, M.C.; Oz, I.A. QUINTESSENCE INTERNATIONAL. 2007 Vol. 38 Nr. 10 Página: 577 – 582.
Other disorders related to mouth breathing

- Sleep disorders
- Daytime sleepiness
  - Lower academic performance
  - Fatigue during physical activities
  - Neck or back pain
- Disturbances of taste and smell
  - Halitosis, dry mouth
  - Susceptibility to infections
    - Snore
  - Breast apnea
Conclusions

- Children with allergic rhinitis have alterations in upper airway

- Conditioning nasal obstruction and consequent mouth breathing

- It is important to evaluate all patients with allergic rhinitis w/or asthma, especially children, to carry out early diagnosis and comprehensive treatment of the anomalies dentomaxilofaciales

- Joint management with pediatrician, allergist, ENT, dental and pediatric orthodontics, physical rehabilitation, psychology
Research
Dentomaxilofaciales changes in children with allergic rhinitis who come to consult the Regional Center of Allergy and Clinical Immunology, University Hospital "Dr. Jose Eleuterio Gonzalez"

A comparative, prospective, blinded, case-control study