DO SUCKING HABITS IN PRESCHOOL CHILDREN INFLUENCE THE POSITION OF THE PRIMARY INCISORS?

The aim of this study was to verify whether sucking habits influence the position of the primary incisors. The sample comprised 34 preschool children (mean age 44 months ± 9 months). They were divided into three groups: group B (n = 9) with a baby bottle habit; group BP (n = 13) with baby bottle and pacifier habits; and a control group C (n = 12) with no sucking habit. Data were derived from face-to-face interviews with the parents/guardians, oral examinations, study casts, facial photographs (frontal/lateral views), and cephalograms. The cephalograms were scanned and subsequently analyzed by one trained and calibrated operator. The cephalometric parameters recorded were: interincisal angle (U1/L1), U1/NA (angle/distance), and L1/NB (angle/distance). The data were analyzed using Stata 7.0. The Kruskall-Wallis test was used to compare the cephalometric measurements in the children with and without sucking habits. The level of significance was set at \( P \leq .05 \). This study found a significant relationship between existing sucking habits and a protrusion of the maxillary and mandibular primary incisors. World J Orthod 2009;10:229–232.

Key words: habits, incisor position, pacifier, primary dentition

Sucking is a physiologic act that is instinctively performed by a fetus while fed through the placenta. It becomes a fully developed reflex at birth.1 Sucking allows a baby to obtain nourishment and also provides comfort. Therefore, a baby’s sucking can be either nutritive or nonnutritive motivated.2 Nonnutritive sucking can turn into a continuous behavior practiced unconsciously,1 leading to a deleterious oral habit (eg, thumb or pacifier sucking).

The development of a normal occlusion depends on an adequate balance between external (lips and cheeks) and internal (tongue) muscle forces.3 Oral habits result in a muscular imbalance that adversely interferes with orofacial growth and may generate or aggravate occlusal problems.4,5

Though orthodontists and pedodontists always knew about the link between oral habits and malocclusions,2 they still did not agree about the age beyond which oral habits can have a detrimental effect on the development of jaws and teeth. Also, there is no detailed information about changes in the primary dentition caused by various oral habits.4,6,7

Therefore, the purpose of this study was to assess the position of the primary incisors in relation to the basal bone in preschool children with and without nonnutritive sucking habits using lateral cephalograms.

MATERIALS AND METHODS

This study was carried out in a Public Health Center and approved by the ethics committee of the sponsoring institution. Only children with the written consent of their parents/guardians were enrolled in this study.
The sample consisted of 34 children (18 girls, 16 boys) between 2 and 5 years (mean age of 44.6 ± 9.7 months) with a complete primary dentition. Children with craniofacial syndromes and previous orthodontic interventions were not included.

The sample was divided into three groups: group B (n = 9) with a baby bottle habit; group BP (n = 13) with a baby bottle and pacifier habit; and a control group C (n = 12) with no sucking habit. Data were collected by face-to-face interviews with the parents/guardians, oral examinations, study casts, facial photographs (frontal/lateral view), and lateral cephalograms that were taken at a specialist’s clinic by the same technician using the same equipment.

The participants’ parents/guardians received diet counseling and oral hygiene instructions for their minors. Further, they were advised on the impact of oral habits on the developing dentition.

The cephalograms were scanned and analyzed with Radiocef Studio software (Radio Memory LTDA 2004) by one trained and calibrated operator. The following cephalometric measurements were recorded: interincisal angle (U1/L1) (ICC = 0.899), U1/NA (angular) (ICC = 0.776), U1/NA (linear) (ICC = 0.881), L1/NB (angular) (ICC = 0.915), and L1/NB (linear) (ICC = 0.678) (Fig 1).

Statistical analysis was done using Stata 7.0. The Kruskall-Wallis test was used for the comparison between the cephalometric measurements of the children with and without sucking habits. The level of significance was set at $P \leq 0.05$.

**RESULTS**

Table 1 depicts the mean values obtained from the cephalometric analysis in each group. The angular measurements for the maxillary incisors were minimally greater in the children with than without a sucking habit (Fig 2). In contrast, the angular measurement for the mandibular incisors was less influenced by a possible sucking habit (Fig 3). Finally, children with a pacifier and bottle habit showed a significant increase in the linear measurements for the maxillary and mandibular incisors (Figs 4 and 5). Figure 6 demonstrates a trend toward a decreased interincisal angle in children with a sucking habit.

<table>
<thead>
<tr>
<th>Cephalometric measurement</th>
<th>No sucking habit group (C)</th>
<th>Bottle habit group (B)</th>
<th>Bottle and pacifier habit group (BP)</th>
<th>$P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance U1/NA (mm)</td>
<td>24.0 (9.4)</td>
<td>23.5 (5.2)</td>
<td>29.5 (4.9)</td>
<td>*</td>
</tr>
<tr>
<td>Distance L1/NB (mm)</td>
<td>4.1 (3.7)</td>
<td>3.4 (1.4)</td>
<td>5.8 (1.9)</td>
<td>**</td>
</tr>
<tr>
<td>U1/NA angle (degrees)</td>
<td>10.0 (6.7)</td>
<td>13.0 (8.5)</td>
<td>10.1 (5.4)</td>
<td>.79</td>
</tr>
<tr>
<td>L1/NB angle (degrees)</td>
<td>-0.3 (2.1)</td>
<td>1.3 (5.3)</td>
<td>0 (2.5)</td>
<td>.83</td>
</tr>
<tr>
<td>Interincisal angle (degrees)</td>
<td>141.4 (14.8)</td>
<td>139.1 (13.5)</td>
<td>133.6 (8.0)</td>
<td>.27</td>
</tr>
</tbody>
</table>

*B vs C, $P = .02$; **B vs C, $P = .008$; A vs C, $P = .03$, SD = standard deviation.
Fig 2  Box plots for the U1/NA angle in the three study groups.

Fig 3  Box plots for the L1/NB angle in the three study groups.

Fig 4  Box plots for the U1/NA distance in the three study groups.

Fig 5  Box plots for the L1/NB distance in the three study groups.

Fig 6  Box plots for the interincisal angle (U1/L1) in the three study groups.
DISCUSSION

Generally, primary teeth are positioned upright over the basal bone, thus the interincisal angle is expected to be obtuse. Although there are articles that state that due to sucking habits the maxillary incisors tip labially and those in the mandible lingually, there are scarce data based on cephalometrics to support these reports.

Beside habits, the incisor position is also influenced by growth. Thus, Mendlovitz and Siqueira observed an increase in the interincisal angle but a decrease in the L1/NB angle from 4 to 5 years; the linear measurements again showed an increase. Vann et al observed that the mean interincisal angle was greater in children with primary teeth (mean 148.4 degrees) than in adults. Ajayi found a mean interincisal angle in Nigerian children of 109 degrees. In this study, the interincisal angle ranged from 116 degrees to 160 degrees.

The data of this study do not confirm that primary mandibular incisors tend to assume a retruded position relative to the basal bone in children with sucking habits. However, the results of this study should be interpreted cautiously because of the small sample size of the three groups investigated.

CONCLUSION

A significant relationship was found between the presence of sucking habits and a protrusion of the maxillary and mandibular incisors.

Sucking habits should be detected as early as possible because a correct diagnosis will allow orthodontists and pediatric dentists to establish an appropriate treatment plan for their young patients, including advising parents about the deleterious effects of sucking habits.

REFERENCES