Mixed longitudinal evaluation of masticatory performance in children 6 to 17 years of age

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Abstract

Introduction

The purposes of this study were to determine (1) how masticatory performance changes with age, (2) whether masticatory performance differs between the sexes, and (3) whether patterns of masticatory performance differ among subjects with various types of malocclusion.

Methods

A total of 450 children and adolescents (244 boys, 206 girls) were assigned to 4 age cohorts (ages 6, 9, 12, and 15 years) and followed for 3 consecutive years. The subjects were selected based on having about equal numbers of boys and girls, and about equal numbers of subjects with normal occlusion and Class I and Class II malocclusions. Masticatory performance was assessed by using the artificial food CutterSili (Iheraus Kuize, South Bend, Ind). The peer assessment rating index was used to quantify the severity of the malocclusions.

Results

Median particle size (MPS) decreased significantly from 6 to 17 years of age. There were no statistically significant differences in MPS between the 3 occlusal groups, but there were significant sex differences, with girls having smaller MPS than boys. Multilevel analysis showed greater decreases in MPS between 6 and 9 years, and after 12 years of age, than between 9 and 12 years of age. There were no significant correlations between MPS and the weighted peer assessment rating index. MPS showed significant intercorrelations between measures of MPS obtained at years 1, 2, and 3, with correlations tending to be highest for the oldest age cohort.

Conclusions

Masticatory performance improves with age, and the changes appear to be influenced by the loss of the deciduous teeth during the late mixed dentition phase of dental development. Although there are limited sex differences in masticatory performance among subjects 6 to 17 years of age, mild forms of Class I and Class II malocclusions have little or no effect on masticatory performance.

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