

DENTAL ATTRITION IN PRESCHOOL CHILDREN

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Summary

The effect of orthodontic anomalies on the occurrence and severity of attrition was studied in a group of 610 subjects of both sexes, aged 3—6 years. Attrition was recorded on biting surfaces of lateral teeth and classified into four degrees according to own classification. With the exception of crowding, attrition was more expressed in dysgnathic subjects, while in the subjects with crossbite and class III anomalies it was found to be most pronounced. It is quite likely that the effect of orthodontic anomalies on the occurrence and severity of attrition results from alterations in occlusal relations and impaired function of the dentition in general.

Key words: attrition, deciduous dentition

INTRODUCTION

Attrition is a functional and parafunctional wearing of a dental substance on the biting and other dental surfaces, differentiated from abrasion, which is mediated by some physical agent (1—3). Attrition may occur in a physiologic way, resulting from mastication, or as a pathologic phenomenon to irregular functioning or positioning of the teeth (4). In deciduous dentition, the course of attrition is much faster because of a specific structure of the teeth, eliciting a stimulative effect on the development of jaws and contributing to the establishment of normal occlusal relations in permanent dentition. Therefore, attrition belongs to a group of common developmental features of deciduous dentition.

The time of onset and expressiveness of attrition may considerably vary (5), since they depend on a number of factors such as food consumption (6, 7), chewing habit (8), neuromuscular type (9), and the presence of bruxism or bruxomania (10, 11).

Many authors consider nutrition, i. e. food consistency, a crucial factor in the occurrence at attrition(2, 12—14). Accordingly, in case of

identical nutrition the extent to which attrition is influenced by other factors can be determined. Pindborg, Berry and Mills (2, 4, 14) have pointed to the importance of orthodontic in the development of attrition. Therefore, the aim of this study was to identify the contributions of particular orthodontic anomalies to the occurrence and severity of the deciduous dentition attrition in a group of children spending most of the time at preschool institutions, i. e. kindergartens, taking 4 daily meals prepared according to qualitative and quantitative standards for children's nutrition.

MATERIALS AND METHODS

The sample consisted of 610 children of both sexes, aged 3—6 years, 343 of them presenting with some of the following orthodontic anomalies: crowding (164), class II/2 (89), crossbite (36), class III (29), and open bite (25). A control group consisted of 267 anomaly-free children. Attrition was recorded on the biting surfaces of lateral teeth and evaluated by four degrees according to own classification, as follows: 0 — no attrition; 1 — abraded tips of the cusps (enamel); 2 — extensive abrasion of the cusps (enamel and dentin); and 3 — the cusps completely abraded. The subjects in whom the degree of attrition could not be assessed (e. g., caries, extracted teeth) were excluded from the study.

RESULTS AND DISCUSSION

The results obtained during this study are presented in Figures 1 and 2. Figure 1 shows the distribution of the degrees of attrition in the groups of subjects with and without anomalies. No substantial differences were observed between the groups of eugnathic and dysgnathic subjects for any of the degrees of attrition (Table 1). The only exception

Table 1 Distribution of the degrees of the deciduous dentition attrition in the subjects with and without anomalies

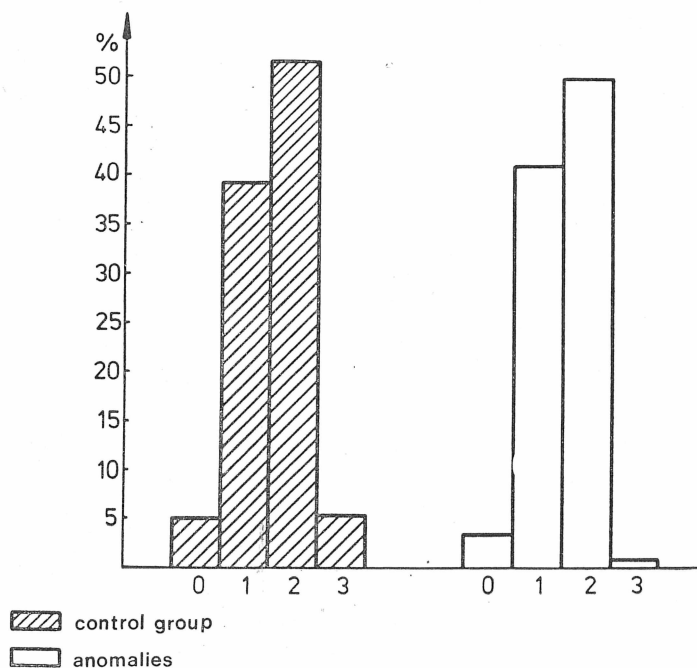
Degree of attrition	Without anomaly (%)	With anomaly (%)	Total (%)
0	13 (4.9%)	11 (3.2%)	24 (3.9%)
1	102 (38.2%)	135 (39.4%)	237 (38.9%)
2	138 (51.7%)	173 (50.4%)	311 (51.0%)
3	14 (5.2%)	24 (7.0%)	38 (6.2%)
Total	267 (100%)	343 (100%)	610 (100%)

was the third degree, which was found to be present to a somewhat higher percentage in the group of eugnathic subjects, but the difference was not statistically significant ($p > 0.05$). This could possibly be explained by the fact in the group with anomalies, crowding was by far

Table 2 Distribution of the degrees of the deciduous dentition attrition according to the degrees of patricular anomalies

of attrition Degree	Without anomaly (%)	Crossbite (%)	Class III anomalies (%)	Open bite (%)	Class II/2 (%)	Crowding (%)
1	102 (38.2 ⁰ / ₀)	10 (27.9 ⁰ / ₀)	10 (34.5 ⁰ / ₀)	8 (32 ⁰ / ₀)	32 (36 ⁰ / ₀)	75 (45.7 ⁰ / ₀)
2	138 (51.7 ⁰ / ₀)	19 (52.8 ⁰ / ₀)	15 (51.7 ⁰ / ₀)	15 (60 ⁰ / ₀)	52 (58.4 ⁰ / ₀)	72 (43.9 ⁰ / ₀)
3	14 (5.2 ⁰ / ₀)	7 (19.4 ⁰ / ₀)	4 (13.8 ⁰ / ₀)	1 (4 ⁰ / ₀)	2 (2.2 ⁰ / ₀)	10 (6.1 ⁰ / ₀)
Total	267 (100 ⁰ / ₀)	36 (100 ⁰ / ₀)	29 (100 ⁰ / ₀)	25(100 ⁰ / ₀)	89 (100 ⁰ / ₀)	164 (100 ⁰ / ₀)

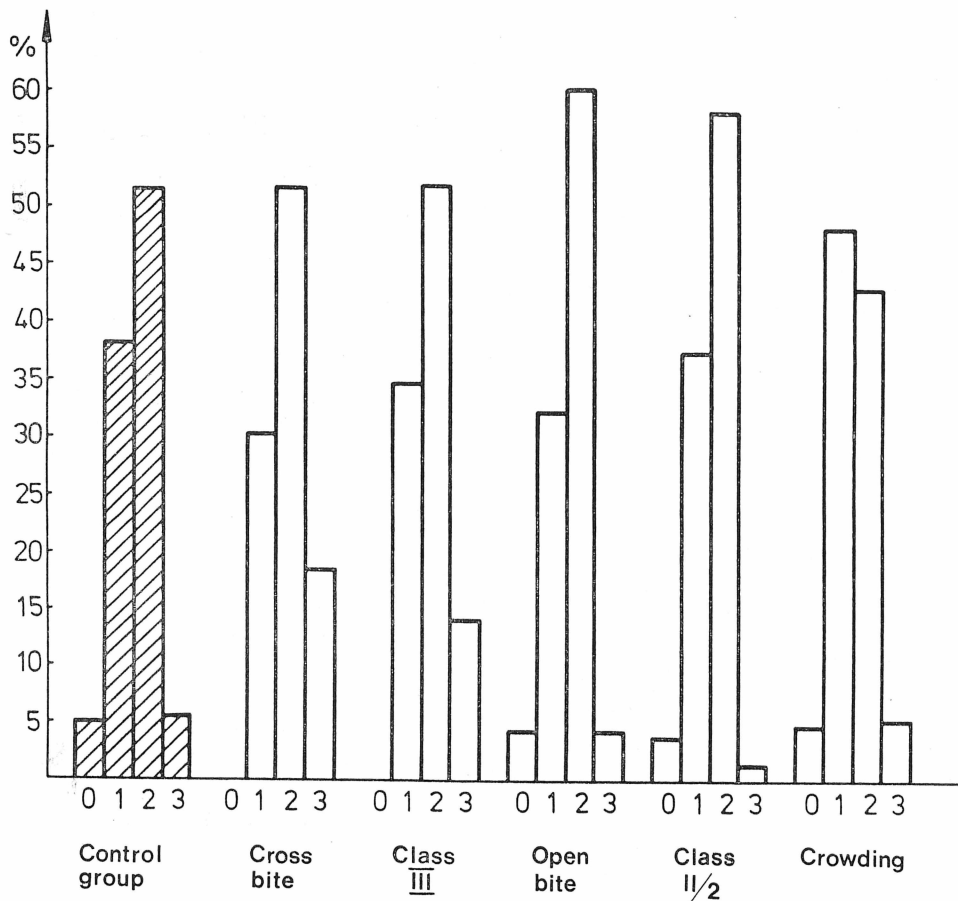
most frequently detected, and attrition is known to be least expressed in this type of anomalies (Table 2). Differences in the presence of the second and third degrees, and the zero and first degrees of attrition



Graf 1 Attrition in preschool children

between the groups of subjects with crowding and those characterized by eugnathia were examined. Higher degrees of attrition (2 and 3) were found to be more frequent in the control group as compared to the group of subjects with crowding. The differences were significant at the level of $p < 0.05$.

The frequencies of particular degrees of attrition within each anomaly and in the control group are shown in Figure 2. Besides the crowding-related specificities mentioned above, all other anomalies were found to be accompanied by a more pronounced attrition. Pronounced forms of attrition were most frequently observed in crossbite, followed by class III, open bite and class II/2 anomalies. Differences in the frequency of the third degree of attrition between the control group and the group



Graf 2 Attrition within each anomaly and in the control group

of subjects with crossbite were shown to be statistically significant ($p < 0.01$). In the groups of children with crossbite and class III, there were no attrition-free subjects (degree 0). Differences for this degree, as compared to the control group, were found to be statistically significant ($p < 0.01$).

These differences could be explained by occlusal specificities characteristic of the subjects with the respective anomalies. Because of the possible premature contacts, forcible moments and sliding obstacles, a reaction of neuromuscular mechanism (9), along with the possible increase in the parafunctional activities (10, 11)), occurs in both anomalies. In the subjects with crowding anomalies, the sagittal intermaxillary relation (class II) is mostly impaired, with a specific chewing habit (and frequently, deep bite), which makes the sliding movements quite difficult and could possibly cause a less pronounced attrition.

CONCLUSIONS

The following conclusions can thus be made:

- Irregularities in the position of teeth and in the intermaxillary relations influence the occurrence and severity attrition;
- With the exception of crowding, attrition is more expressed in dysgnathic than in eugnathic subjects;
- More pronounced forms of attrition are most frequently found in crossbite and class III; and
- The contribution of orthodontic anomalies to the occurrence and severity of the deciduous dentition attrition, resulting from alterations in occlusal relations and impaired function, should not be neglected.

Sažetak

DENTALNA ATRICIJA U PREDŠKOLSKE DJECE

Na uzroku od 610 ispitanika, oba spola, ispitan je utjecaj ortodontskih anomalija na pojavu i intenzitet atricije. Istraživanje je provedeno na ispitanicima od 3—6 godina starosti. Atricija je registrirana na griznim ploham lateralnih zubi, a vrednovana je s tri stupnja vlastite namjenske sheme.

Osim kod kompresijskih anomalija, atricija je izraženija kod disgnatih ispitanika. Najjače je izražena u ispitanika s unakrsnim zagrizom i anomalijama progenog kompleksa.

Utjecaj ortodontskih anomalija na pojavu i intenzitet atricije vjerojatno proizlazi iz promjena okluzijskih odnosa i poremećene funkcije.

Ključne riječi: atricija, mliječna denticija

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