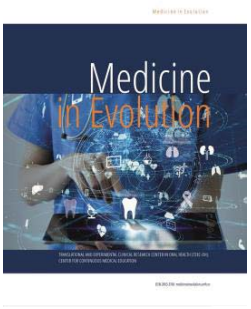
Oral distribution of dental calculus in schoolchildren in Bucharest, Romania



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Abstract

Aim and objectives: The main role of this paper is to find a pattern of oral distribution of dental calculus in children. **Material and methods**: The data presented in this paper are part of the PAROGYM study: 1595 of Bucharest schoolchildren aged 11 to 14 years were examined. Dental calculus was measured using Silness and Löe calculus index (CI). **Results**: The prevalence of dental calculus (CI score > 0) was 44%. Calculus was observed more on buccal and lateral surfaces of the first upper molars and on oral and lateral surfaces of the lower incisors. **Conclusions**: The oral distribution of dental calculus respects the general pattern but is quite different from the pattern of oral distribution of gingivitis.

Keywords: dental calculus, distribution, children

INTRODUCTION

Caries and plaque-induced gingivitis are common oral diseases and frequently observed in children [1]. They are prevalent among schoolchildren from Bucharest, Romania aged 11-12 years [2,3].

Dental calculus is a complete mineralized bacterial deposit which covers some teeth surfaces or dental restorations and is one of the main risk factors for gingivitis and periodontal diseases. However, the correlation between calculus and gingivitis/periodontitis is not strong as correlation between dental plaque and prevalence of gingivitis/periodontitis, but still it is also difficult to compare because dental calculus is frequently covered with dental plaque [4]. Fortunately, dental calculus is not observed very often in children. It is very rare in preschool children and up to 34% between 14-17 years [5]. The calculus score was under 0.1 in 11-14 years old Bucharest schoolchildren population [3]. Green, orange and black stain can also be observed on dental check-ups in children [5].

Aim and objectives

The main scope of this paper is to detect a pattern of oral distribution of dental calculus in children, including the teeth and surfaces frequently covered by calculus.

MATERIAL AND METHODS

The data from this paper are part of the PAROGYM cross-sectional study and its design was described in previously papers. Briefly, 1595 children aged 11 to 14 years were examined for caries, teeth eruption pattern, periodontal diseases including gingivitis, and their risk factors such as calculus, caries and restorations in relation with periodontal tissues. Some data about caries, gingivitis and teeth eruption were previously published [2,3,6,7].

The classes (5^{th} to 8^{th}) were used like clusters and the sample was stratified on geographic areas of Bucharest (downtown, middle, outskirts and surrounding areas), grades, and the presence of a dental unit in schools.

Dental calculus was measured using Silness and Löe calculus index (CI) [8]:

- "0" = no calculus
- "1" = supragingival calculus
- "2" = subgingival calculus
- "3" = abundance of calculus

The analysis, including mean values of CI scores, was performed using the EpiInfo (Centers for Disease Control and Prevention, Atlanta, GA, USA) and SPSS software, version 16 (SPSS Inc., Chicago, IL, USA). At least one parent for every child examined in this study signed the inform consent. The study was approved by the Ethical Committee of the "Carol Davila" University of Medicine and Pharmacy.

RESULTS

The prevalence of dental calculus (CI score > 0) was 43.7%.

Different forms of dental calculus were found: black stains (figures 1-3), supragingival calculus (figure 4), abundance of calculus (figure 5).



Figure 1, 2, 3. Black stains

Figure 4. Supragingival calculus

Figure 5. Abundance of calculus

The mean values for the CI scores for every tooth surface are exposed in tables no. I and II.

Table I. CI scores for the surfaces of the upper teeth

Upper teeth					
Tooth	**Surface**	**CI score**	**Tooth**	**Surface**	**CI score**
17	buccal	0.03	27	buccal	0.02
17	mesial	0.04	27	mesial	0.03
17	distal	0.04	27	distal	0.03
17	oral	0.02	27	oral	0.02
16	buccal	0.17	26	buccal	0.19
16	mesial	0.20	26	mesial	0.21
16	distal	0.18	26	distal	0.20
16	oral	0.04	26	oral	0.05
15	buccal	0.03	25	buccal	0.05
15	mesial	0.05	25	mesial	0.08
15	distal	0.06	25	distal	0.08
15	oral	0.02	25	oral	0.03
14	buccal	0.02	24	buccal	0.03
14	mesial	0.04	24	mesial	0.05
14	distal	0.04	24	distal	0.05
14	oral	0.02	24	oral	0.02
13	buccal	0.01	23	buccal	0.01
13	mesial	0.03	23	mesial	0.03
13	distal	0.03	23	distal	0.03
13	oral	0.02	23	oral	0.02
12	buccal	0.01	22	buccal	0.01
12	mesial	0.04	22	mesial	0.04
12	distal	0.03	22	distal	0.04
12	oral	0.03	22	oral	0.03
11	buccal	0.01	21	buccal	0.01

11	mesial	0.04	21	mesial	0.04
11	distal	0.04	21	distal	0.04
11	oral	0.03	21	oral	0.03

Table II. CI scores for the surfaces of the lower teeth

Lower teeth					
Tooth	**Surface**	**CI score**	**Tooth**	**Surface**	**CI score**
37	buccal	0.01	47	buccal	0.01
37	mesial	0.02	47	mesial	0.02
37	distal	0.02	47	distal	0.02
37	oral	0.03	47	oral	0.02
36	buccal	0.02	46	buccal	0.03
36	mesial	0.05	46	mesial	0.04
36	distal	0.04	46	distal	0.04
36	oral	0.07	46	oral	0.06
35	buccal	0.01	45	buccal	0.01
35	mesial	0.04	45	mesial	0.03
35	distal	0.03	45	distal	0.03
35	oral	0.03	45	oral	0.03
34	buccal	0.01	44	buccal	0.01
34	mesial	0.03	44	mesial	0.04
34	distal	0.03	44	distal	0.03
34	oral	0.03	44	oral	0.03
33	buccal	0.01	43	buccal	0.01
33	mesial	0.08	43	mesial	0.07
33	distal	0.08	43	distal	0.06
33	oral	0.06	43	oral	0.05
32	buccal	0.04	42	buccal	0.04
32	mesial	0.32	42	mesial	0.33
32	distal	0.28	42	distal	0.29
32	oral	0.19	42	oral	0.19
31	buccal	0.05	41	buccal	0.06
31	mesial	0.54	41	mesial	0.56
31	distal	0.50	41	distal	0.52
31	oral	0.32	41	oral	0.32

DISCUSSIONS

This paper shows that at least 2 from 5 children have dental calculus. Similar results on similar age interval were discovered by Goel at all [9]. This is a very important item since presence of dental calculus influences gingival condition [10]. However, prevalence of gingivitis in Bucharest schoolchildren is much higher (slightly over 90%) [3], the mechanism of gingival inflammation being more complex than a simple presence of dental calculus. From the analyses of the previous papers, we discovered that both, gingivitis and dental calculus are related to economic and educational level and the presence of a dental unit in school [3].

Higher values of calculus scores were on oral and lateral surfaces of lower incisors, and on buccal and lateral surfaces of upper first molars. This observation is absolutely normal since dental calculus is a mineralized dental plaque deposit present where is a constant supply of saliva [11]. However, gingivitis is more intense around the maxillary lateral incisors. First upper molars and lower incisors being are not affected by gingival inflammation as much as lateral upper incisors [3]. So, the oral distribution of gingivitis is quite different from the oral distribution of dental calculus. There are many risk factors that influence gingival inflammation in addition to dental calculus, such as dental plaque and oral hygiene, hormonal background, dental crowding, dental restorations and crowns. So, the oral distribution of gingivitis is more complex and is related to all risk factors involved.

CONCLUSIONS

The oral distribution of dental calculus respects the main pattern, first upper molars (buccal and lateral surfaces) and the lower incisors (oral and lateral surfaces) have deposits of calculus more often. On the other hand, the oral distribution of gingivitis is different, the mechanism of gingival inflammation being more complex than a simple presence of dental calculus.

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