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# *Clinical results of individual prevention of tooth decay observed during a long period of time*

Dental caries is a common pathology in children and as such is counted among social diseases due to its widespread incidence and health effects. The disease however can be prevented effectively (3, 10). According to the present state of art the development of dental caries is conditioned by four concomitant etiological factors: cariogenic bacteria, carbohydrates present in the oral cavity that provide a substrate for enzymatic bacterial processes, time and the frequency of pathogenic activity and finally dental tissue susceptibility to demineralization (2, 11, 12). Considering multiple causes dental caries can be prevented by comprehensive action (1, 4, 5, 6, 7, 8, 9).

The purpose of the study was to evaluate the state of oral health after 7 years of individual comprehensive prevention of dental caries started at the fifth year of child's age.

## MATERIAL AND METHODS

Preliminary clinical examination covered a group of 80 five-year-old children who had under gone oral sanation before the first permanent teeth erupted. The children and their parents were instructed on oral health care techniques. Besides, the parents were informed about the principles of well-balanced diet. In the children selected for the study growing in permanent molars and premolars were individually sealed with a fluoride containing sealant and varnished with a fluoride varnish 2–4 times a year. Before each procedure the teeth were thoroughly cleaned of deposits and the children and their parents were interviewed on everyday oral health care procedures and diet. At check-ups the areas of seal loss were restored. During 7-year-regular program of individual comprehensive prevention of dental caries 25 (31.25%) participants were seen regularly. 18 children (22.5%) made their appointments irregularly. Those children who did not participate regularly were seen at longer than 6 months' intervals between dental appointments. Together 43 children took part in the program, i.e. 53.75% of all examined initially. The control group consisted of 30 children who did not participate in the program of individual comprehensive prevention of dental caries. Clinical examination determined dental caries frequency, index DMF and its components D, M and F.

## RESULTS

The results are presented in Tables 1–5. Table 1 shows caries frequency, DMF and its components D, M and F determined in all teeth and first molars in 12-year-old children (after 7 years of the program). In the group examined regularly caries frequency was 24% and DMF = 0.32, however in permanent molars caries frequency was 20% and DMF = 0.24. In the group examined irregularly caries frequency was 77.78% and DMF = 1.67 but in permanent molars caries frequency was 77.78% and DMF = 1.33. In the groups regularly and irregularly seen the

treatment index was 1. In the control group caries frequency was 99.67% and DMF = 4.33 but in first permanent molars caries frequency was 99.67% and DMF = 3.33; the treatment index = 0.55.

Table 1. Caries indexes

| | Group examined regularly | Group examined irregularly | Control group |
|---|---|---|---|
| Number of examined | 25 | 18 | 30 |
| Caries frequency (all teeth) | 24% | 77.78% | 99.67% |
| DMF (all teeth) | 0.32 | 1.67 | 4.33 |
| D (all teeth) | 0 | 0 | 1,90 |
| M (all teeth) | 0 | 0 | 0,10 |
| F (all teeth) | 0.32 | 1.67 | 2.33 |
| Caries frequency (first molars) | 20% | 77.78% | 99.67% |
| DMF (first molars) | 0.24 | 1.33 | 3.33 |
| D (first molars) | 0 | 0 | 1.5 |
| M (first molars) | 0 | 0 | 0.10 |
| F (first molars) | 0.24 | 1.33 | 1.73 |

Table 2 lists caries in the groups seen regularly with regard to tooth types and surfaces. In the group seen regularly 62.5% cavities were located on the interproximal surfaces of first molars, 25% were detected on the interproximal surfaces of front teeth and 12.5% on the buccal surfaces of lower molars. No cavities were located on the occlusal surfaces or the premolar teeth.

Table 2. Caries in the group examined regularly

| Dental caries | | First molars | | | Incisor and canine teeth | |
|---|---|---|---|---|---|---|
| | | interproximal surface | buccal or palatal surface | occlusal surface | palatal surface | interproximal surface |
| Number | 8 | 5 | 1 | 0 | 0 | 2 |
| % | 100 | 62.5 | 12.5 | 0 | 0 | 25 |

Table 3 presents caries detected in the group of children seen irregularly with regard to the tooth types and surfaces. In that group 50% of cavities were located on the occlusal surfaces of first molars. All of them were situated on the distal or mesial occlusal surface, i.e. in the areas with seal loss unrestored. No cavities were affecting the entire occlusal surface, i.e. on its mesial, central or distal surface in those teeth. 23.33% of cavities were located on the interproximal surfaces of first molars, 13.67% on the buccal surfaces of lower molars and the palatal surfaces of upper molars and 10% were located on the interproximal surfaces of front teeth. There were no cavities detected on the premolars.

Table 3. Caries in the group examined irregularly

| Dental caries | | First molars | | | Incisor and canine teeth | |
|---|---|---|---|---|---|---|
| | | interproximal surface | buccal or palatal surface | occlusal surface | palatal surface | interproximal surface |
| Number | 30 | 7 | 5 | 15 | 0 | 3 |
| % | 100 | 23.33 | 16.67 | 50.0 | 0 | 10.0 |

Table 4 presents caries with regard to the tooth types and surfaces in the control group, i.e. in the group who did not participate in the program of individual comprehensive prevention of dental caries. In that group 3 molars were extracted as a result of decay, 63.78% of caries were located on the occlusal surfaces of first molars. However, all cavities detected in that group affected the entire occlusal surface in its mesial, central and distal part. Interproximal surfaces of the first molars was the place of 12.6% of cavities, 7.87% of cavities were located on the buccal surfaces of lower molars and palatal surfaces of the upper molars, 10.24% were located on the interproximal surfaces of front teeth and 3.15% on the palatal surfaces of the lateral incisors; 2.36% of cavities were situated on the premolars.

Table 4. Caries in the control group

| Dental caries | | Premolars | First molars | | | Incisor and canine teeth | |
|---|---|---|---|---|---|---|---|
| | | | inter-proximal surface | buccal or palatal surface | occlusal surface | palatal surface | inter-proximal surface |
| Number | 127 | 3 | 16 | 10 | 81 | 4 | 13 |
| % | 100 | 2.36 | 12.6 | 7.87 | 63.78 | 3.15 | 10.24 |

Table 5 shows the total number of caries detected in all the children in three study groups. In 12-year-olds the total number of caries was 165: in the group seen regularly – 8 (4.85%), in the group seen irregularly – 30 (18.18%) and in the control group 127 (76.97).

Table 5. Number and percentage of cavities in the examined groups referred to the total number of caries detected

| Caries | Number | Percent |
|---|---|---|
| In all 12-year-olds | 165 | 100% |
| Group examined regularly | 8 | 4.85% |
| Group examined irregularly | 30 | 18.18% |
| Control group | 127 | 76.97% |

## CONCLUSIONS

1. The individual prevention of dental caries reduces the number of decayed teeth considerably.

2. In the group regularly participating in the program of individual comprehensive prevention no cavities were detected on the occlusal surfaces of first permanent molars, only a small per cent of caries was located on the interproximal surface.

3. In the group of irregular participants in the program a considerable reduction of dental caries incidence located on the occlusal surfaces of first permanent molars was found in addition to much less extent of caries lesions.

## REFERENCES


1. Berner-Strzelczyk A., Zgoda M. M.: Fluor – profilaktyka i leczenie próchnicy zębów. Bromat. Chem. Toksykol., 36, 1, 89, 2003.
2. Bhuridej P. et al.: Natural history of treatment outcomes of permanent first molars: a study of sealant effectiveness. J. Am. Dent. Assoc., 136, 9, 1265, 2005.
3. Chadwick B.: Flowable restorative system has a higher retention rate than conventional resin sealant on primary teeth. Evid. Based. Dent., 6, 4, 89, 2005.
4. Dąbrowska E. et al.: Profilaktyka próchnicy zębów z zastosowaniem związków fluoru. Klin. Pediat., 7, 2, 229, 1999.
5. Dorantes C. et al.: Assessment of retention rates and clinical benefits of a community sealant program. Pediatr. Dent., 27, 3, 212, 2005.
6. Jańczuk Z.: O problemach związanych z profilaktycznym lakowaniem szczelin zębów trzonowych u dzieci. Mag. Stom., 2, (2/3), 34, 1993.
7. Jańczuk Z. et al.: Jak lakowanie bruzd zębów trzonowych może zmienić stan uzębienia polskich dzieci? Prz. Stom. Wieku Rozwoj., 1/2, 48.1993.
8. Jodkowska E., Raczyńska M.: Ocena skuteczności uszczelniania zębów bocznych u dzieci materiałem lonosit-Seal w profilaktyce próchnicy – obserwacje pięcioletnie. Stom. Współcz., 10, 31, 2003.
9. Krawczyk D.: Ocena profilaktycznego lakowania bruzd i szczelin anatomicznych zębów szóstych u dzieci z miasta Lublina. Praca doktorska, AM w Lublinie, 1997.
10. Mielnik-Błaszczak M. et al.: Stomatologiczne potrzeby lecznicze u dzieci specjalnej troski. Annales UMCS, Sect. D, 58, 2, 1, 2003.
11. Opydo-Szymaczek J.: Profilaktyka fluorkowa próchnicy zębów – rys historyczny, współczesne poglądy związane z tym zagadnieniem Pozn. Stom., 28, 145, 2001.
12. Perdigao J. et al.: Microtensile adhesion of sealants to intact enamel. Int. J. Paediatr. Dent., 15, 5, 342, 2005.
13. Sikorska-Jaroszyńska M. et al.: Ocena kliniczna utrzymania laku Helioseal F i Dyract Seal w pierwszych stałych zębach trzonowych – obserwacje jednoroczne. Stom. Współcz., 8, 45, 2001.
14. Szajewska-Jarzynka W., Wójtowicz D.: Wstępne obserwacje zastosowania laku szczelinowego Conseal F u dzieci i młodzieży. Stom. Współcz., 8, 3, 35, 2001.
15. Wędrychowicz-Welman A.: Trzyletnia ocena kliniczna laku szczelinowego zawierającego fluor UltraSeal XT plus u dzieci szkolnych. Dent. Forum, 30, 1, 17, 2004.


## SUMMARY


Preliminary clinical examination covered a group of 80 five-year-old children who underwent oral sanation before the first permanent teeth erupted. The children and their parents were instructed on oral health care techniques. Besides, the parents were informed about the principles of well-balanced diet. In the children selected for the study growing in permanent molars and premolars were individually sealed with a fluoride containing sealant and varnished with a fluoride varnish 2 – 4 times a year. Before each procedure the teeth were thoroughly cleaned of deposits and the children and their parents were interviewed on everyday oral health care procedures and diet. At check-ups the areas of seal loss were restored. During the 7-year regular program of individual comprehensive prevention of dental caries 25 (31.25%) of participants were seen regularly, 18 children (22.5%) made their appointments irregularly. Those children who did not participate regularly were attended at longer than 6 months' intervals between dental appointments. Together 43 children took part in the program, i.e. 53.75% of the group examined initially. The control group consisted of 30 children who did not participate in the program of individual comprehensive prevention of dental caries. The investigations let formulate the following conclusions: the individual prevention of caries reduces the number of decayed teeth considerably. In the group of regular participants of the program of dental caries comprehensive

prevention the results revealed no caries on the occlusal teeth surfaces and decreased number of dental caries occurring on interproximal buccal and palatal surfaces in comparison to the control group.

Długoletnie obserwacje kliniczne efektów indywidualnej profilaktyki próchnicy zębów

Wstępnym badaniem klinicznym objęto 80 dzieci w wieku 5 lat, u których przeprowadzono sanację jamy ustnej przed wyrznięciem się pierwszych zębów stałych oraz instruktaż higieny jamy ustnej. W instruktażu higieny jamy ustnej uczestniczyli również opiekunowie dzieci, których poinformowano o zasadach prawidłowego odżywiania. U dzieci zakwalifikowanych do badania przeprowadzano lakowanie kolejno wyrzynających się zębów stałych trzonowych i przedtrzonowych lakiem z fluorem oraz lakierowanie lakierem fluorkowym 2–4 razy do roku. Każdy taki zabieg poprzedzony był dokładnym oczyszczeniem zębów z osadu oraz rozmową z dzieckiem i opiekunem, dotyczącą przeprowadzanych w domu zabiegów higienicznych i sposobów odżywiania. W czasie wizyt kontrolnych częściowe ubytki laku były uzupełniane. Przez 7 lat regularnie w programie kompleksowej profilaktyki próchnicy uczestniczyło 25 dzieci (31,25%), a 18 dzieci (22,5%) uczestniczyło w programie nieregularnie, czyli przerwy pomiędzy wizytami były dłuższe niż 6 miesięcy. Ogółem w programie uczestniczyło 43 dzieci, co stanowiło 53,75% z grupy objętej wstępnym badaniem klinicznym. Grupę kontrolną stanowiło 30 dzieci, które nie uczestniczyły w programie indywidualnej kompleksowej profilaktyki próchnicy. Na podstawie przeprowadzonych badań stwierdzono, że indywidualna profilaktyka próchnicy pozwala na znaczne zredukowanie liczby zębów z ubytkami próchnicowymi. W grupie dzieci regularnie uczestniczących w programie kompleksowej profilaktyki próchnicy nie stwierdzono ubytków próchnicowych na powierzchniach żujących zębów oraz zmniejszenie liczby ubytków próchnicowych występujących na powierzchniach stycznych policzkowych i podniebiennych w stosunku do grupy kontrolnej.