Prevalence of Dental Caries in the Municipality Gorazde During the Period 2007-2012

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ABSTRACT

Introduction: Dental caries today, regardless of known multi causal etiology of the disease and the possibility of its effective prevention still represents the most widespread disease of our civilization, which affects about 95% of our population. It affects all populations and age groups and is a disease that is very difficult to completely eradicate due to a complex interaction of biological factors, eating habits, social status etc. Goal is to report the prevalence of dental caries, DMFT-index and DMFT index in the first and seventh grades of grammar school in the municipality Gorazde during the last six years. Material and methods: Children, which have yet to enroll in school and in the seventh grade children, have required medical examinations. A total of 1198 first grade and 1666 seventh-grade students are included. To determine the prevalence of dental caries DMFT was used. Examinations are carried out in accordance with the methodology and criteria of the WHO, by a dental mirror and dental probe. Results: The prevalence of dental caries is extremely high as well as the values of DMFT index in the first and seventh grades in the municipality Gorazde. Conclusion: In practice it is necessary to introduce prevention programs for pregnant women, toddlers, preschool and school-aged children with a wider use of the mass media.

Key words: oral health, DMF index, children, Municipality Gorazde.

1. INTRODUCTION

Caries is today, regardless of familiarity of its multi causal etiology of the disease and the possibility of its effective prevention still the most widespread disease of our civilization, which affects about 95% of our population. It covers all populations and age groups (1), and is a disease that is very difficult to completely eradicate due to a complex interaction of biological factors, eating habits, social status, etc. (2).

Although it rarely leads to dramatic medical states as some other diseases, tooth decay may be a cause of many disorders in the body (3).

In the oral cavity due to carious destruction of tooth structure is reduced chewing ability, because it can cause pain and insufficiently chewed food can cause disturbances in the gastrointestinal system, which over time can cause irreversible changes in the mucosa of the stomach and intestines. Sharp edges of by caries damaged teeth irritate oral soft tissue and enable the development of various diseases due to local irritation, such as gingivitis, glossitis, stomatitis and even precancerous lesion. Progression of caries to the pulp opens the door to bacterial invasion of the body and can cause various diseases such as osteomyelitis, osteitis, various forms of abscess, phlegmon, acute and chronic lymphadenitis and sepsis. It has possibility to create a secondary disease of the skin, eyes, heart, lungs, kidneys and the joints (4).

According to the definition of the World Health Organization (WHO) the term caries implies local, pathological process of exogenous origin, with progressive flow of universal nature and unclear etiology (5), but one of the best definitions, which also provides further guidance for its effective prevention has been given by professor Loesch: “Tooth caries is a chronic, complex bacterial infection, which results in milligram loss of minerals from the tooth, which is affected by the infection. Despite multi causal etiology, the main factors are bacteria and eating habits, which ensure conditions for disease development and its detection” (6).

2. MATERIAL AND METHODS

This research was conducted in the municipality Gorazde from 2007 to 2012. Systematic examinations of children attending the first and seventh grade are carried out each year.
by the WHO recommendations and are performed in the dental clinic of Primary Health Care Center in Gorazde. The research was conducted using cross-sectional epidemiological study, also called prevalence study, to measure the incidence of dental caries among children examined the prevalence was calculated (%).

Included are children who attended the first and seventh grades of primary schools in the municipality Gorazde. The total number of students is shown in Table 1.

|                  | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | Total |
|------------------|------|------|------|------|------|------|-------|
| First grade students | 242  | 223  | 192  | 184  | 176  | 181  | 1198  |
| Seventh grade students | 212  | 285  | 408  | 347  | 141  | 273  | 1666  |

Table 1. Total number of students

**Assessment of oral health:**

Examinations students were carried out in the dental clinic of the Primary Health Care Center Gorazde with unique access to all respondents (7).

All data that were determined by examination were entered into a single chart, which is used during regular check-ups at the Health Care Center (Figure 1).

The data, which were entered in this chart are obtained on the basis of an objective review, which was carried out by dentists, skilled for this type of research (8,9).

**DMF index**

For the analysis of caries prevalence in populations most commonly is used DMF index (D-Decay, M-Missing, F-Filled), also called the Klein-Palmer Index. This index is simple, fast and versatile diagnostic tool to assess the state of the teeth. For baby teeth is used DMFs index. If for a statistical analysis is taken the whole tooth, then this index is marked as DMFT and if only tooth surface is taken then it is called DMFS.

In determining the dental status was used visual and tactile methods of caries detection with the help of a flat dental mirrors and probes. Testing was done with one on the adjacent tooth.

To mark the teeth were used letters for baby teeth and permanent teeth numbers for the codes listed in Table 2.

The basic criterion for the presence of teeth was to have at least one active area of the studied teeth.

In the case of the presence of milk and permanent teeth at the same place the presence of permanent teeth was registered (9).

DMFT values were calculated as $D(1+2)+M(3)+F(4)$

3. **RESULTS**

**First grade:**

The prevalence of dental caries in children who are just enrolled in school in the municipality Gorazde is extremely high, as it can be seen in the Figure 2.

**DMFT for children in first grade**

DMFT-index in children in the first grade in the municipality Gorazde ranged from 7.93 to 9.86. Over 90% of the DMFT-index makes untreated tooth caries. Fillings of primary teeth are very scarce as structure itself, as well as value of DMFT index shown in Figure 3.

**DMFT index for children in first grade**

DMFT-index in children in the first grade in the municipality Gorazde has a tendency to change the structure of DMFT index in favor of repaired teeth.

Also is encouraging the fact that in 2009 there was not a single extracted tooth.

**Seventh grade:**

Neither among the seventh grade students the situation is not much better. Caries prevalence is affected by the infection. Despite multicausal etiology, the main factors are bacteria and local, pathological process of exogenous origin, with progressive flow of universal nature and immune system of the body and can cause various diseases such as osteomyelitis, osteitis, various forms of abscess, phlegmon, acute and chronic lymphadenitis and sepsis. It has complex bacterial infection, which results in milligram loss of minerals from the tooth, which is affected by the infection.

To mark the teeth were used letters for baby teeth and permanent teeth numbers for the codes listed in Table 2.

Table 2: Codes for determination of dental status

| Labels for deciduous teeth | Labels for permanent teeth | Teeth status |
|---------------------------|---------------------------|--------------|
| A                         | 0                         | Healthy      |
| B                         | 1                         | Carious      |
| C                         | 2                         | Filled with caries |
| D                         | 3                         | Filled without caries |
| E                         | 4                         | Extracted due to caries |
|                          | 5                         | Extracted due to some other reason |
| F                         | 6                         | Cast fisure  |
|                          | 7                         | Girder bridge, porcelain cover etc. |
| T                         | 8                         | Unerupted tooth |
|                          | 9                         | Unregistered permanent tooth |

Figure 1. Patient chart for the systematic review

Figure 2. Prevalence of dental caries in children in the first grade

Figure 3. Structure of DMFT index among first grade students in the municipality Gorazde

Figure 4. The value of DMFT index among first grade students in the municipality Gorazde
positive trend in terms of increase in recently healed teeth.

4. DISCUSSION

The largest component of DMFT index is still untreated caries, although there is apparent positive trend in terms of increase in recently healed teeth.

**DMFT for children seventh grade**

Analyzing the intensity of caries in the municipality Gorazde among children of seventh grade, we came to the result that the DMFT index in the period 2007-2012 range from 5.42 in 2012 to 6.67 in 2007 which can be seen from the Figure 6.

**Figure 6. DMFT for children in seventh grade**

The largest component of DMFT Index is still untreated caries, although there is apparent positive trend in terms of increase in recently healed teeth.

There are many reasons for such a poor state of oral health in Bosnia-Podrinje Canton. The first reason is the low level of knowledge among parents about oral health, especially in the primary dentition, and rare are parents which bring the child to the dental clinic before the onset of acute symptoms. A large number of parents do not know that the “sixes” are permanent teeth, or why baby teeth are important and need to be brushed regularly.

One important reason is the insufficient amount of fluorine, which is introduced into the body, because the natural water in Bosnia and Herzegovina is deficient in fluoride. Probable cause may be a lack of prevention programs, which can be implemented in early childhood and the lack of preschool dental clinics. In Bosnia-Podrinje Canton there isn’t a single specialist pediatric dentists but with children are working polyvalent dentists, who, due to the volume of work preferred permanent dentition, and to the primary teeth are not given special attention.

Based on the results of this epidemiological study and comparison with similar studies it can be concluded that in the area of Bosnia-Podrinje Canton oral health is a major health and social problem. This finding is in some way are warning alarm for the health care system but also for the whole society.

Improving oral health and dental health can only be achieved if the programs for the promotion of oral health and disease prevention are implemented at the community, region or state level. To lead to improvement of oral health it is necessary to find effective modes for solving problems related to oral health, putting emphasis on the organization of primary health care system and the introduction of measures and prevention programs that will provide optimal results in the future period.
5. CONCLUSION

Since the state of oral health in Bosnia-Podrinje Canton is really poor, it is necessary as soon as possible to introduce into practice a preventive program for children aged up to 15 years, which would in the near future give positive results. Then it is necessary the involvement of all sectors of health and education in the prevention of oral diseases and risk factors for oral diseases, as well as wider use of the mass media in order to improve and strengthen individual awareness about the importance of oral health.

ACKNOWLEDGMENTS

We thank the NGO “Worldvision” on the extraordinary cooperation and support for the conduction of this research.

REFERENCES

1. Selwitz RH, Ismail Al, Pitts NB. Dental caries. Lancet. 2007; 369(9555): 51-59.
2. Ismail Al, Tanzer JM, Dingle JL. Current trends of sugar consumption in developing societies. Community Dent Oral Epidemiol. 1997; 25(6): 483-443.
3. Hallsten AL, Poulsen S, Koch G. Pedodontska oralna skrb – osvrti. U: Pedodoncija – klinički pristup. Ured Koch G, Poulsen S. Zagreb: Naklada ”Slap”, 2005: 15-20.
4. Beloica D, Vuličević ZR. Socijalni i psiholočki značaj oboljenja usta i zuba. U: Preventivna stomatologija. Ured Beloica D et al. Beograd: Elit Medica, 2002.
5. Tahmiščija H, Ganibegović-Selimović M, Kobašlija S. Preventiva u dječjoj stomatologiji. Sarajevo: ”Svjetlost”, 1998.
6. Loesch WJ. The rationale for caries prevention through the use of sugar substitutes. Int Dent J. 1985; 35: 1-8.
7. Gojkov-Vukelic M, Hadžić S, Pasic E. Laser Treatment of Oral Mucosa Tattoo. Acta Inform Med. 2011 Dec; 19(4): 244-246. doi:10.5455/aim.2011.19.244-246.
8. Tenovuo J, Aaltonen AS. Antibody responses to mutans streptococci in children. Proc Finn Dent Soc. 1991; 87: 449-461.
9. Ainamo J, Holloway PJ. Principal requirements for controlled clinical trials of caries preventive agents and procedures; Technical report No 1. Third edition; Commission on Oral Health, Research and Epidemiology; Int Dent J; sep. 1982; 32(3); 293-305.
10. Vrbić V, Vulović M, Rajić Z, Tatić E, Malić M, et al. Dental caries in postwar Bosnia and Herzegovina. Community Dent Oral Epidemiol. 1987: 16: 286-288.
11. Hatbirović Š. Stanje oralnog zdravštva i primjena najpogodnijih preventivnih mjera kod djece i omladine u SRBiH. Doktorska disertacija. Samoškološki fakultet Univerziteta u Sarajevu, 1987.
12. Kobašlija S, Maglajlić N, Huseinbegović-Čengić A, Tahmiščija H. Prevalencija karijesa u djece u Sarajevu. Acta Stomatol Croat. 2000; 34(1): 83-85.
13. Selimović-Dragaš M. Utjecaj životne sredine na stanje oralnog zdravlja raseljene djece. Magistarski rad. Univerzitet u Sarajevu; 2002.
14. Deljo E. Epidemiološka studija i primjena preventivnih mjera u Bosansko-podrinjskom kantonu. Magistarski rad. Stomatološki fakultet Univerziteta u Sarajevu, 2009.
15. Poulsen S, Malling Pedersen M. Dental caries in Danish children: 1988-2001. European Journal of Paediatric Dentistry. 2002; 3: 195-198.
16. Nordblad A, Vehkalahti M & the working group for oral health. (2004b). Oral health. In Arpo Aroma & Seppo Koskinen (Eds). Health and Functional Capacity in Finland. Baseline Results of the Health 2000 Health Examination Survey. Helsinki: Publications of the National Public Health Institute (KTL), B12/2004.
17. Haugejorden O, Birkeland JM. Analysis of the ups and downs of caries experience among Norwegian children aged five years between 1997 and 2003. Acta Odontologica Scandinavica. 2005; 63: 115-122.
18. de Almeida C, Petersen PE, André, A. Toscano. Changing oral health status of 6- and 12-year-old schoolchildren in Portugal. Community Dental Health, 2003; (20): 211-216.
19. Al-Malik MI, Rehbinia YA. Prevalence of Dental Caries, Severity, and Pattern in Age 6 to 7-Year-old Children in a Selected Community in Saudi Arabia. J Contemp Dent Pract. 2006 May; 7(2): 46-54.
20. FDA Commission on Oral Health, Research and Epidemiology. An epidemiological index of developmental defects of dental enamel (DDEindex). Int Dent J. 1992; 42: 411-426.
21. Fejerskov O, Larsen MJ, Richards A, Bauch V. Dental tissue effects of fluoride. Adv Dent Res. 1994; 8: 15-31.
22. Petersen PE. Changing oral health profiles of the children in Central and Eastern Europe-Challenges for the 21st century. Available (25.06.2009.) from: http://who.int/entity/oral_health/media/en/orh_eastern_europe.pdf
23. Deljo E. et al. Impact of continuous Education about oral Hygiene on the changes of CPI-index for 12-15 year-old Schoolchildren. Acta Inform Med. 2011; 19(4): 220-223.
24. Ivančović A, Lukić I, Ivančović Z, Radić A, Vukić I, Simić A. Dental caries in postwar Bosnia and Herzegovina. Community Dent Oral Epidemiol. 2003; 31(2): 100-104.
25. Suleimanagić H, Kobašlija S, Sadiković M, Huseinbegović A, Selimović-Dragaš M, et al. Stomatologija dana u Bosni i Hercegovini. Bilten ljekarske komore Zeničko-Dobojskog kantona. 2001; 2: 41-46.
26. Deljo E. et al. Status of the Oral Health by the Seventh Grade Students in the Bosnian Podrinje Canton. Acta Inform Med, 2011; 19(1): 28-31.
27. Muratbegović A, Marković N, Kobašlija S, Zukanović A. Indeks oralnog zdravlja i hipomineralizacija kutnjaka i sjekutića kod bosanske djece u dobi od 12 godina. Acta Stomatol Croat. 2008; 42(2): 155-163.
28. Golubović Lj. Procjena oralnog zdravlja dvanaestogodišnjaka u Crnoj Gori. Magistarski rad. Univerzitet u Sarajevu; 2004.
29. Suleimanagić H, Kobašlija S, Sadiković M, Huseinbegović A, Selimović-Dragaš M, et al. Stomatologija dana u Bosni i Hercegovini. Bilten ljekarske komore Zeničko-Dobojskog kantona. 2001; 2: 41-46.
30. Muratbegović A, Marković N, Kobašlija S, Zukanović A. Indeks oralnog zdravlja i hipomineralizacija kutnjaka i sjekutića kod bosanske djece u dobi od 12 godina. Acta Stomatol Croat. 2008; 42(2): 155-163.