ORIGINAL RESEARCH

Prevalence and Intensity of Dental Caries in School-age Children of the Krasnoyarsk Territory.

Alexandra Israpilovna Ramazanova[1], Aishat Kebedovna Kebedova[2], Aida Magomed-Kamilovna Rashkuyeva[2], Diana Arsenovna Rasulova[2], Raisat Bagavudinovna Ammayeva[2], Sultan Ibrahimovich Musaev[2], Murad Magomedovich Alibekov[2], Gasan Magomed-Alievich Budaichiev[2]

Abstract

Introduction: The high level of prevalence and intensity of dental caries in school children reflects the urgency of the problem and the necessity of proper dental education among children and their parents and to develop recommendations aimed at the prevention of dental caries.

Aim: To find out the epidemiological situation of dental caries in school age children of Krasnoyarsk Territory.

Materials and Methods: A study was conducted on the prevalence and intensity of dental caries in 232 school-age children of educational institutions in the city of Norilsk, Krasnoyarsk Krai and 386 children in the city of Talnakh aged 7 to 17 years. The study used a special dental examination card recommended by WHO (2013).

Results: The results obtained characterize an unfavorable level of morbidity with a high level of dental treatment needs and preventive care. School children and their parents exhibited low level of knowledge pertaining to sanitary conditions. The situation dictates the need for further intensification of the prevention of dental diseases and sanitary and educational work among the population.

Conclusion: The research showed the inimical epidemiological situation of dental caries in school-age children of the Krasnoyarsk Territory. The situation dictates the need for further intensification of sanitary and educational work and the introduction of an interdepartmental program for the prevention of dental caries in the region.

Keywords: dental caries, school-age children, oral hygiene, prevention.

Oral and Maxillofacial Pathology Journal (2023): ***https://www.ompj.org/archives***

Introduction

The high level of prevalence and intensity of dental caries reflects the urgency of the problem and the necessity of prevention of dental diseases in school-age children.[1-4] It is known that tooth decay depends on the medical and geographical conditions of residence, thus the prevalence and intensity of dental caries significantly differs between residents of the south from those of the North.[5-7] The conditions of the Krasnoyarsk Territory are characterized by extreme climatic features which have a negative impact on the condition of organs and tissues of the oral cavity, which determines the prevalence and intensity of dental caries.[8-11] The occurrence of a cariogenic situation in the oral cavity is associated with an unsatisfactory state of oral hygiene, the presence of abundant plaque which creates conditions for the demineralization of tooth enamel.[12-16]

It should be noted that the improvement of dental care is based on knowledge of the clinical and epidemiological features of pathological processes. Taking into account the above, we conducted a study with respect to prevalence and intensity of dental caries in schoolchildren of this region.

The purpose of this study was to determine the indicators of the frequency and severity of caries of permanent teeth and to develop recommendations aimed at its prevention in school-age children.

[1]National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow, Russia; [2]Dagestan State Medical University, Makhachkala, Dagestan Republic, Russia.

Corresponding author: Gasan Magomed-Alievich Budaichiev, Dagestan State Medical University, Makhachkala, Dagestan Republic, Russia. E mail: gasan.budachiev005@mail.ru

How to cite this article: Ramazanova AI, Kebedova AK, Rashkuyeva AM, Rasulova DA, Ammayeva RB, Musaev SI, Alibekov MM, Budaichiev GM. Prevalence and intensity of dental caries in school-age children of the Krasnoyarsk territory. Oral Maxillofac Pathol J 2023;14(1): page no.9-

Source of Support: Nil

Conflict of Interest: None

Materials and Methods

A study was conducted on the prevalence and intensity of dental caries in 232 school-age children of educational institutions in the city of Norilsk, Krasnoyarsk Krai (n=232) and 386 children in the city of Talnakh (n=386) aged 7 to 17 years in 14 schools. The study used a special dental examination card recommended by WHO (2013). Dental caries damage was assessed according to the criteria of prevalence and intensity.

The prevalence of dental caries was determined by the ratio of the number of persons with at least one of the signs of dental caries (carious, filled or removed teeth) further CFR index, to the total number of examined as a percentage. The intensity of the lesion was determined by the sum of teeth affected by caries, filled and removed, which was calculated individually for one or a group of examined. In addition, the need for dental care was determined by the method of P.A. Leus (1977). The studied age groups were formed by random sampling. The results of the dental examination were interpreted using standard indicators and criteria recommended by WHO. To assess the level of sanitary culture of schoolchildren and their parents, a questionnaire was conducted for 141 for these children and parents.

Results

The studies were conducted with the prior voluntary consent of parents in accordance with the ethical principles of conducting scientific medical research with human participation, defined by the Helsinki Declaration of the World Medical Association and the requirements set out in the main regulatory documents of the Russian Federation on clinical research.

Statistical processing of clinical material was carried out using standard descriptive statistics with the analysis of qualitative indicators (Tables 1, 2).

Discussion

The conducted clinical and epidemiological study of schoolchildren revealed an inimical situation in the incidence of dental caries (Tables 1, 2). Thus, in 7-year-old schoolchildren of the city of Norilsk, the prevalence is at the level of 85.38 ± 1.19%, in 8-9-year-old children of primary school age it reaches 100%, and in other age groups it was in ranges from 80.19± 1.71 to 93.10±0.29. In the key age group of 12-year-olds, the obtained prevalence indicator according to WHO is interpreted as a high level (83.31 ±0.75%), the intensity of the lesion is 6.12± 0.41, which is also defined as a high level.

Table 1: Indicators of the incidence of permanent teeth with caries in children of the city of Norilsk

Age group	Prevalence, %	Intensity by CFR index	Structural ratio of the CFR index, %	
			caries	filling teeth
7years(n=14)	85,38±1,19	4,60±0,84	58,32±3,39	26,87±5,96
8years(n=13)	100	6,30±0,75	50,11±4,32	23,07±6,66
9years(n=16)	100	4,62±0,75	54,45±3,33	20,55±5,81
10years(n=15)	80,19±1,71	4,20±0,83	46,15±4,14	26,92±5,63
11years(n=27)	92,59±0,36	5,81±0,55	55,18±2,21	27,54±3,58
12years(n=37)	83,31±0,75	6,12±0,41	45,47±2,08	36,39±2,42
13years(n=22)	81,81±1,03	6,51±0,59	60,62±2,25	26,63±4,19
14years(n=30)	93,10±0,29	7,93±0,39	68,88±1,40	21,12±3,40
15years(n=30)	85,71±0,61	8,44±0,36	80,47±0,84	11,10±3,83
16years(n=16)	87,50±0,91	4,93±0,88	62,18±2,76	27,22±5,32
17years(n=12)	92,84±2,23	5,91±1,02	58,25±3,85	25,25±6,90
Total(n=232)	89,03±0,14	5,55±0,13	66,10±0,39	21,72±0,91

Table 2: Indicators of the incidence of permanent teeth with caries in school-age children of the city of Talnakh

Age group	Prevalence, %	Intensity by CFR index	C	F	R
7years(n=39)	62,96±1,37	1,07±0,12	68,36±1,17	30,62±2,58	1,02±3,68
8years(n=45)	60,17±1,34	2,03±0,22	65,93±1,14	32,91±2,25	1,16±3,32
9years(n=52)	71,42±0,87	2,66±0,16	62,14±1,15	35,62±1,97	2,24±2,99
10years(n=46)	82,22±0,59	2,87±0,27	65,25±1,15	30,9±2,30	3,85±3,20
11years(n=43)	93,49±0,22	3,05±0,32	61,43±1,34	34,15±2,29	4,42±3,32
12years(n=37)	96,68±0,12	4,63±0,21	52,82±1,80	43,57±2,15	3,61±3,67
13years(n=44)	97,22±0,09	5,38±0,59	50,18±1,70	45,02±1,88	4,80±3,26
14years(n=42)	98,43±0,05	6,26±0,58	52,73±1,67	42,08±2,05	5,19±3,35
15years(n=38)	98,62±0,05	6,12±0,41	50,96±1,86	43,68±2,13	5,36±3,59
Total:(n=386)	84,57±0,13	3,78±0,11	58,86±0,35	37,62±0,53	3,52±0,85

In the structure of the components of the CFR index, a significant predominance of carious and removed teeth over filled ones was determined, their average statistical indicators were 66.10± 0.39, 12.18± 1.03 and 21.72±0.91%, respectively. The obtained data of the CFR index coefficients characterize the need for high level of dental care for school children.

It should be noted that the interviewed schoolchildren of the city of Talnakh also showed a similar situation in terms of prevalence. Thus, its indicator in the age groups ranged from 60.17 ± 1.34 to 98.62 ± 0.05%, the average indicator was at the level of 84.57 ± 0.13%. As for the intensity of caries, the minimum and maximum data, respectively, ranged from 1.07 ± 0.12 to 6.26± 0.58. At the same time, in the age group of 12-year-old schoolchildren, the prevalence was 96.68 ± 0.12% (according to WHO, a high level), and the severity of dental caries was 4.63 ± 0.21.

Comparative analysis showed that the prevalence of caries in 12-year-olds in Ulyanovsk is 89.6%, Moscow region - 81.7%, Khabarovsk - 92.45%, Nalchik – 93%. At the same time, the intensity of caries in 12-year–old schoolchildren in Ulyanovsk is 5.0, Moscow region - 2.9, Khabarovsk - 1.74, Nalchik - 4.3. Thus, according to E.M. Kuzmina (2012), the prevalence of permanent caries among the population of the Russian Federation in 12-year-olds is 71%, and in 15-year-olds summer teenagers - 82%, while in the Krasnoyarsk Territory these figures were 89.99 and 92.16%.

It should be emphasized that in these structural ratios of the components of the CFR index, carious and removed teeth also predominate over filled teeth by 1.65 times, which also determines the need for dental care in schoolchildren.

A comparative analysis of the components of the CFR index in schoolchildren characterizes some quantitative and qualitative differences when comparing the data of extracted teeth. Thus, schoolchildren in the city of Norilsk have a significant predominance of extracted teeth compared to schoolchildren in the city of Talnakh by 3.46 times.

It should be emphasized that the level of sanitary culture and the frequency and intensity of dental caries have a direct relationship. We conducted a sociological study of schoolchildren and their parents. So, to the question "How would you assess the condition of your teeth?" 44% of respondents answered that they "have several carious cavities", 9.9% – "there are multiple carious cavities". The condition of the teeth was assessed as "good" by only 32.2%. The majority (70.5%) of respondents had a soft plaque in the cervical (posterior) area of the teeth; 19.4% had a soft plaque outside the posterior (posterior) area of the teeth; 10.1% had tartar in the posterior (posterior) area of the teeth. Analysis of the survey results showed that in adolescence (22%) sometimes experience toothache or discomfort. In general, the results of the survey confirm the importance and necessity of constant sanitary and educational work.

The hygienic condition of the oral cavity was characterized as unsatisfactory – 2.2 according to the Fedorov-Volodkina index (1971), and in adolescents – 3.1 according to the Green-Vermillion index (Green, Vermillion, 1964). At the same time, it was found that 75.1% of schoolchildren were aware of the need for brushing twice daily, but only 35.3% regularly brush their teeth. This indicates a low level of dental health education for children and their parents.

Conclusion

The obtained research data reveals the adverse epidemiological situation of dental caries in school-age children of the Krasnoyarsk Territory. In addition, the study highlighted the unsatisfactory hygienic condition of the oral cavity and a low level of sanitary culture in children and parents were. This situation dictates the need for further intensification of sanitary and educational work and the introduction of an interdepartmental program for the prevention of dental caries in the region.

References

1. Goodarzi A, Heidarnia A, Tavafian SS, Eslami M. Evaluation of decayed, missing and filled teeth (DMFT) index in the 12 years old students of Tehran City, Iran. Braz J Oral Sci. 2018;17:18888.
2. Peres MA, Macpherson LM, Weyant RJ, Daly B, Venturelli R, Mathur MR, Listl S, Celeste RK, Guarnizo-Herreño CC, Kearns C. Oral diseases: a global public health challenge. Lancet. 2019; 394(10194):249–60.
3. Motlagh ME, Ziaodini H, Qorbani M, Taheri M, Aminaei T, Goodarzi A, Ataie-Jafari A, Rezaei F, Ahadi Z, Shafiee G. Methodology and early findings of the fifth survey of childhood and adolescence surveillance and prevention of adult noncommunicable disease: the CASPIAN-V study. Int J Prev Med. 2017;8.
4. Alves LS, Susin C, Dame-Teixeira N, Maltz M. Impact of different detection criteria on caries estimates and risk assessment. Int Dent J. 2018;68(3):144–51.
5. Pitts NB, Chadwick B, Anderson T. Children's Dental Health Survey 2013. Report 2: Dental Disease and Damage in Children England, Wales and Northern Ireland. London: Health and Social Care Information Centre; 2015.
6. Vernazza CR, Rolland SL, Chadwick B, Pitts N. Caries experience, the caries burden and associated factors in children in England, Wales and Northern Ireland 2013. Br Dent J. 2016;221(6):315–20.
7. Martignon S, Pitts NB, Goffin G, Mazevet M, Douglas GVA, Newton JT, et al. Caries Care practice guide: consensus on evidence into practice. Br Dent J. 2019;227(5):353–62.
8. Dye BA, Mitnik GL, Iafolla TJ, Vargas CM. Trends in dental caries in children and adolecents according to poverty status in the United States from 1999 through 2004 and from 2011 through 2014. J Am Dent Assoc. 2017;148(8):550–65.
9. Cheng LL. Limited evidence suggesting silver diamine fluoride may arrest dental caries in children. J Am Dent Assoc. 2017;148(2):120–2.
10. Lam S, Baros H, O'Grady M, Kendall G, Messer L, Slack-Smith L. Patterns of attendance of children under 12 years at school dental service in Western Australia. Open Dent J. 2012; 6:69–73.
11. Teich ST. Risk assessment-based individualized treatment (RABIT): a comprehensive approach to dental patient recall. J Dent Educ. 2013;77:448–57.
12. Sudhir KM, Kanupuru KK, Fareed N, Mahesh P, Vandana K, Chaitra NT. CAMBRA as a tool for caries risk prediction among 12- to 13-year-old institutionalised children - a longitudinal follow-up study. Oral Health Prev Dent. 2016;14:355–62.
13. Marinho VC, Worthington HV, Walsh T, Chong LY. Fluoride gels for preventing dental caries in children and adolescents. Cochrane Database Syst Rev. 2015:CD002280.
14. Marinho VC, Chong LY, Worthington HV, Walsh T. Fluoride mouth rinses for preventing dental caries in children and adolescents. Cochrane Database Syst Rev. 2016:CD002284.
15. Walsh T, Worthington HV, Glenny AM, Marinho VC, Jeroncic A. Fluoride toothpastes of different concentrations for preventing dental caries. Cochrane Database Syst Rev. 2019:CD007868.
16. Chen L, Al-Bayatee S, Khurshid Z, Shavandi A, Brunton P, Ratnayake J. Hydroxyapatite in oral care products - a review. Materials (Basel). 2021;14:4865.