TERESA BACHANEK, MAŁGORZATA KLICHOWSKA-PALONKA, EWA WOLAŃSKA, MIROSŁAW ORŁOWSKI

Badania porównawcze uzębienia stałego dzieci w wieku 12 lat z województwa lubelskiego

Comparative study of the permanent dentition among 12-year-old children in the Lublin Region

Streszczenie

Cel. Celem pracy była ocena trendu choroby próchnicowej w okresie 20 lat u dzieci 12-letnich mieszkających na terenie wsi i małych miast województwa lubelskiego w roku 1987, 1997 i 2007.

Materiał i metody. Badanie stomatologiczne przeprowadzono zgodnie z wytycznymi WHO dla badań epidemiologicznych. Ogółem zbadano 421 dzieci tym 238 mieszkających na wsiach i 183 mieszkających w małych miastach. Stan zmineralizowanych tkanek zębów oceniano na podstawie intensywności i frekwencji próchnicy zębów.

Wyniki i wnioski. Na przestrzeni 20 lat sytuacja epidemiologiczna choroby próchnicowej w badanej populacji, opisana wartościami wybranych wskaźników wykazała poprawę tylko w grupie chłopców mieszkających na wsi. Celowe wydaje się ponowne przeprowadzenie analizy wybranych wskaźników w województwie lubelskim celem wdrożenia bardziej efektywnych metod profilaktyczno–leczniczych przeciwdziałających rozwojowi choroby próchnicowej.

Słowa kluczowe: dzieci 12-letnie, zęby stałe, DMFT, badania porównawcze

Summary

Aim. The objective of the study was the analysis of dental caries tendency over a 20-year-period among 12-year-old children living in rural areas and small towns in the Lublin Region in the years 1987, 1997 and 2007.

Material and methods. Dental examination was performed according to the WHO guidelines for epidemiological studies. A total number of 421 children were examined, including 238 rural inhabitants and 183 living in small towns. The state of mineralized tissues of the teeth was evaluated based on the intensity and frequency of dental carries.

Results and conclusion. During the period of 20 years the epidemiological situation concerning carious disease in the population examined, described by means of the values of selected indices, showed improvement only in the group of rural boys. It seems justifiable to analyze the selected indices in the Lublin Region once again in order to implement more effective prophylactic-treatment methods counteracting the development of carious disease.

Key words: 12-year-old children, permanent teeth, DMFT, comparative study

Chair and Department of Conservative Dentistry, Medical University of Lublin

INTRODUCTION

Over the last 20 years, in many developed countries, a considerable decrease in the occurrence of carious disease has been observed, both with respect to frequency and intensity of the disease. The results of epidemiological studies based on guidelines defined by the World Health Organization are a basic source of information concerning morbidity due to dental caries. These guidelines cover the performance of examinations in specified age intervals with the unification of the technique of clinical studies and application of unified quantitative indices. Age standards adopted by the WHO concerning children and adolescents, covering three age intervals: 6, 12 and 18, result from physiological changes which subsequently occur during the development and maturation of an individual and enable the comparison of results from many parts of the world. Epidemiologists dealing with the problems concerning dental caries are most interested in children aged 12 years. The WHO specified health targets for the European countries which were meant to be achieved by the year 2000. The target for the 12-year-olds was the value of the DMFT index lower than 3.

The detailed health goal currently proposed in Poland for children aged 12, at a control point which is the year 2015, is the mean value of the DMFT index equal to 2 [1, 2]. Since 1979, in Poland, epidemiological studies of large population groups have been carried out under the patronage of the WHO within the system of unified techniques. These studies allow for the observation of changes in the tendency of carious changes in various regions of the country, and indicate that in Poland the problem of morbidity due to dental caries is still extant and requires the undertaking of complex actions [2-6].

OBJECTIVE

The objective of the study was evaluation of dental caries tendency over 20 years among 12-year-old children living in rural areas and small towns in the Lublin Region in the years 1987, 1997 and 2007.

MATERIAL AND METHODS

Dental examination was performed according the WHO guidelines for epidemiological studies. In the years 1997 and 2007 this examination was a part of an national monitoring of the oral cavity condition. The study group covered 12-year-old children from small towns and rural areas of the Lublin Region. A total number of 421 children were examined, including 238 rural inhabitants and 183 subjects living in small towns (with a population below 20,000 inhabitants).

In 1987, 72 children were examined – 41 boys and 31 girls; in 1997 – 175 children: 85 boys and 90 girls, and in 2007 – 174 children: 78 boys and 96 girls. In all of the studied children the number of teeth was determined considering carious defects, fillings and the number of teeth extracted due to caries. The state of mineralised tooth tissues was evaluated based on the frequency and intensity of dental caries in individual years, with consideration of gender and place of residence. The results were subject to statistical analysis and presented in the form of tables and graphs.

RESULTS

The frequency of caries among 12-year-old children from the Lublin Region over the period of 20 years is high and the mean values are as follows: for children examined in 1987 – 90.27%; in 1997 – 89.14% and in 2007 – 92.02%. The frequency of caries among rural boys improved in 1997 (88.89%), compared to the year 1987 (90.32%); however, studies conducted in 2007 showed an increase in the occurrence of carious disease (93.93%) – Fig.1. The frequency of caries among rural girl decreased in 1997 down to 77.50%, compared to 1987, when it was 90.24%, whereas in 2007 an increase was noted up to 93.75%. However, in 2007 in small towns, a decrease was observed in the frequency of dental caries among girls (91.74%), compared to 1997 (96.0%) – Fig.2. These differences were not statistically significant.

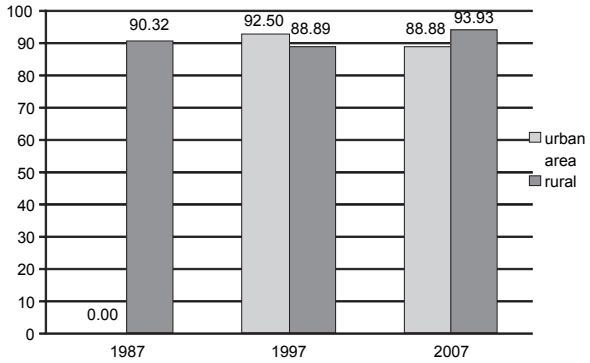

FIGURE 1. Frequency of dental caries among 12-year-old boys in rural and urban areas in 1987, 1997 and 2007..

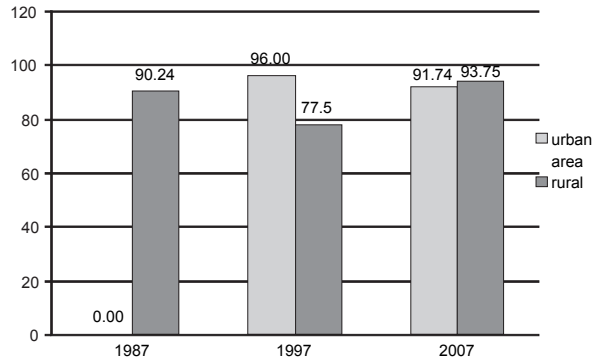

FIGURE 2. Frequency of dental caries among girls in urban and rural areas in 1987, 1997 and 2007.

In 1987, the value of the DMFT index among rural children was 4.37 on average (±2.85), while in 1997 this value was 3.48 (±2.78), and in 2007 – 4.39 (± 2.70). In 1997 a significant decrease was noted in the value of the index, compared to 1987, and in 2007 a significant increase occurred again. Among children from the urban environment the mean values of the DMFT index were as follows: in 1997- 4.49 (± 2.65), and in 2007 – 4.42(±2.94). In 1987, the intensity of caries among rural boys was 3.77 (± 2.25) and was lower than among girls – 4.83 (± 3.19) in the same year. A higher intensity of dental caries among girls was also observed in 2007 (Table 1). The mean value of the DMFT index for rural boys was 3.79 and was lower than among girls – 4.40. The differences in the intensity of caries in the years 1987, 1997 and 2007 among boys and girls living in rural areas were not statistically significant.

TABLE 1. The DMFT index for urban and rural population in the years 1987, 1997 and 2007.

	URBAN AREAS						RURAL AREAS					
	Males			Females			Males			Females		
year of study	n	MFT	SD	n	MFT	SD	n	MFT	SD	n	MFT	SD
1987	-	-	-	-	-	-	31	3.77	2.25	41	4.83	3.19
1997	40	4.17	2.32	50	4.74	2.89	45	3.49	2.68	40	3.47	2.93
2007	45	4.87	3.35	48	4.00	2.46	33	3.79	2.31	48	4.81	2.89
Total	85	4.54	2.92	98	4.38	2.70	109	3.66	2.43	129	4.40	3.04
p-value	0.437			0.169			0.636			0.059		

Kruskal-Wallis test – all differences between groups are not statistically significant

In 1997 the intensity of caries among children from small towns in the Lublin Region was 4.17 (± 2.32) among boys and 4.74 (± 2.89) in the group of girls. In 2007 the intensity of caries among boys and girls was 4.87 (± 3.35) and 4.00 (± 2.46), respectively.

DISCUSSION

In many countries the state of dentition of children and adolescents is clearly better and an improvement has been observed over the last 20 years. This has become possible as a result of adopting new standards of behaviour of the whole populations, i.e. changes in the attitudes towards hygiene, breastfeeding, cigarette smoking, addition of fluoride to toothpaste, implementation of changes in the quality of food products consumed, especially those designed for children. An improvement in the state of dentition is one of many benefits which is the effect of social factors such as: standards of health-promoting behaviour, provision of common access to various levels of prophylaxis, or technical results of care for the environment. Many comparative studies concerning caries indices in the European countries indicate a decrease in the morbidity due to carious disease [7], in Germany and Italy the differences occur between various regions of these countries [8,9].

The frequency of caries among 12-year-old children in other European countries was: in 1999 in Portugal – 52.9% [10], and in 2004 in Germany – 60.7%. In Bosnia and Herzegovina, after completion of military actions in 1995, the frequency of caries among 12-year-old children was 94% [11].

Comparative studies of dental health and treatment needs conducted among 12-year-old children living in eight various EU countries show differences in the DMFT. The highest DMFT values were noted in Germany, Greece and Italy, while the lowest – in Sweden [7, 8, 9, 12]. In 1983 in Belgium the DMFT for the 12-year-olds was 7.5, and a significant decrease was noted down to 2.5 [13] in 1998. In Slovenia the value of the DMFT index was: in 1987 – 5.1 and in 1998 – 1.8 [7].

In Poland such favourable changes in the state of dentition have not yet been observed; however, the problems occur that have attracted the attention of epidemiologists and organizers of health care worldwide, who have noticed an increase in the variation in the state of health of populations between individual regions and various social groups.

Epidemiological studies conducted in Poland show large differences in the occurrence of carious disease between individual regions. In 1987 in nationwide studies the frequency of caries among 12-year-old children was over 85%, and in the presented study concerning only rural children – 90.27% [4]. Studies of the frequency of caries in the subsequent years indicated that the value of this index still remains very high – approximately 90%. In the presented study an upward tendency may even be observed in the frequency of caries among rural children from 90.27 to 91.95%; similar observations were reported based on studies of rural children from the macro region of Warsaw [4]. In the epidemiological studies covering 2,275 twelve-year-old children in Poland the frequency of caries was 80.7 in general – 79.3 among boys and 82.0 – among girls. The frequency of caries in the urban region was 77.7, while in the rural areas – 84.1 [4].

The DMFT value among children aged 12 was from 2.8 in the Opole Region to 5.3 in the Białystok region. In these studies the value of DMFT index for the Lublin Region was 4 [4]. In Polish reports concerning the comparison of mean DMFT values in the years 1987, 1995 and 2003, these values were 4.4, 4.3, and 3.9, respectively. The summing up of these studies was the presumption that since the mid-90s a downward tendency has been noted in the occurrence of dental caries among schoolchildren [4]. In the presented studies performed in 1987, 1997 and 2007, the DMFT index for the first year of the studies was the same – 4.37, while in the subsequent years it decreased down to 3.48, and ultimately increased to 4.39.

The studies of the 12-year-old children conducted in other regions of Poland provided the following DMFT values: in 1995 the DMFT value for Polish 12-year-olds was 4.2; in 1997– 4.0; 1999 – 4.0; and in 2000 – 3.8 [4]. In the comparative study of the state of permanent dentition (DMFT) in the group of children aged 12 living in the rural areas and small towns of macro region of Warsaw, the values were as follows: in 1987 – 3.7 and 3.7; in 1993 – 7.8 and 6.7; and in 1998 – 7.91 and 5.56, respectively [4]. The mean DMFT value for the population of the Łódź Region was 3.19, and was higher in rural areas (3.14), compared to urban areas (2.92). In 2003, the mean DMFT value was slightly higher (3.19) than in 2000 – 2.97. To compare the intensity of caries among 12-year-olds in Łódź the values were as follows: in 1993 – 4.8; in 1995 – 4.26; and in 1998 – 4.0 [14, 15]. In the monitoring of Polish children of 2007, the mean total value of caries was 3.07; 2.9 for boys and 3.2 for girls in the urban areas and in the rural areas – 2.8 and 3.4, respectively [2].

The comparative studies of the occurrence of dental caries in the years 1987 and 2003 conducted among children from various environments by other researchers in other regions of Poland, indicated a decrease in the DMFT value in the group of children aged 12 [1-4]. The above-presented results show a non-uniform image of the intensity of dental caries according to the region of Poland, revealing differences in the life standard of the inhabitants associated with poorer development of a region.

Based on the results of investigations carried out in rural areas and small towns in the Lublin Region it may be presumed that it is necessary to develop prophylactic programmes biased not only towards populations and the frequency of caries, but also adjusted to the type of region. It seems that considering the lack of changes in the values of caries indices over the period of 20 years the actions to-date are insufficient, and the authorities responsible for the organization of social life in the region should be made interested in a health-promoting policy.

CONCLUSIONS

1. An increase observed in the frequency of caries in the rural environment may indicate increasing of civilisation differences in our society.
2. No differences in the intensity of caries were observed according to gender.
3. It seems justifiable to implement more effective prophylactic and treatment methods to counteract the development of carious disease and to undertake preventive actions biased towards the environments, where the deterioration of the state of hard tooth tissues has been noted.

REFERENCES:

1. Adamowicz-Klepalska B, Wierzbicka M, Strużycka I. Założenia i cele zdrowia jamy ustnej w kraju na lata 2006-2020. Czas Stomatol.; 2005, 58(6): 457-460.
2. Wierzbicka M., Kaczmarek U.: Trend choroby próchnicowej u 12-letnich dzieci na podstawie badań monitoringowych stanu zdrowia jamy ustnej. Czy polskie dzieci mają szansę na osiągnięcie narodowego i europejskiego celu zdrowia jamy ustnej? Dent Med Prob, 2009, 46 (2): 149-56.
3. Wędrychowicz-Welman A., Stopa J.: Ocena wpływu trzyletniego programu profilaktyczno-leczniczego na stan jamy ustnej u dzieci szklonych. Czas Stomatol. 2009, 62(8): 637-48.
4. Ziętek M. Zdrowie jamy ustnej Polaków. Czas Stomatol. 2005, 58(6): 388-391.
5. Wierzbicka M, Peterson PE, Szatko F, Dybizbanska E, Kalo I. Changing oral health status and oral health behaviour of schoolchildren in Poland. Comm Dent Health. 2002, 19 (4):243.
6. Golińska A, Perendyk J. Stan zdrowotny uzębienia stałego u dzieci 12-letnich z makroregionu Warszawy – badania porównawcze. Nowa Stomatol. 1998, 3:26-28.
7. Bolin AK. Children's dental health in Europe. An epidemiological investigation and 12-year-old children from eight EU countries. Swed Dent J. 1997, Suppl. 122: 1-88.
8. Schulte AG, Momeni A, Pieper K. Caries frequency in 12-year-old children from Germany. Results of the 2004 national survey. Community Dent Health. 2006, 23(4)**:** 197-202.
9. Pieper K. Schulte AG. The decline in dental caries among 12-year-old children in Germany between 1994 and 2000. Community Dent Health. 2004, 21(3):199-206.
10. Almeida CM, Petersen PE, Andre SJ, Toscano A. Changing oral health status of 6- and 12-year-old schoolchildren in Portugal. Community Dent Health. 2003, 20(4):211-16.
11. Ivankoic A, Lukic IK, Ivanković Z, Radić A, Vukić I, Simic A. Dental caries postwar Bosnia and Herzegovina. Comm Dent Oral Epidemiol. 2003, 31(2):100-4.
12. Demertzi A, Topisoglou V, Muronidis S. Caries frequency of 11.5 year-olds between 1989 and 2001 in province of North-Eastern Greece. Comm Dent Health. 2006, 23(3):140-6.
13. Carvalho JC, Van Nieuwenhuysen JP, D´Hoore W. The decline in dental caries Belgian children between 1983 and 1998. Community Dent Oral Epidemiol. 2001, 29:55-61.
14. Rybarczyk – Townsend E, Lubowiedzka B, Wochna – Sobańska M. Wskaźnik SIC u 12 letnich dzieci województwa łódzkiego w 2003 roku. Dent Med Probl. 2005,42(1): 65-8.
15. Proc P, Pypeć JL. Dental caries and oral health practices in 12-year-old children in Łódź Nowa Stom. 2003, 24(2):55-8.

Informacje o Autorach:
Prof. zw. dr hab. n. med. Teresa Bachanek – kierownik, dr n. med. Małgorzata Klichowska-palonka - adiunkt, dr n. med. Ewa Wolańska – starszy wykładowca, dr n. med. Mirosław Orłowski – adiunkt, Katedra i Zakład Stomatologii Zachowawczej, Uniwersytet Medyczny w Lublinie.

Adres do korespondencji:
Katedra i Zakład Stomatologii Zachowawczej
Uniwersytet Medyczny w Lublinie
20-081 Lublin, Karmelicka 7; tel.: 815287920;
e-mail: zstzach@am.lublin.pl