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Prophylactic and therapeutic needs concerning the first molar teeth in 7-year-old children hospitalized in the Chair and Department of Paedodontics of Medical University of Lublin

In the group of 7-year-old children caries of permanent teeth concerns almost exclusively first molar teeth (2, 13, 14). It is assumed, that caries of masticatory surface of the first molar teeth has a great influence on the value of the whole dentition CDF (5). The first molar teeth are very supple to caries because of their anatomy. Immediately after eruption they have little mineralized tissues and deep grooves. Such anatomy favours accumulation of bacteria and start of caries, which can lead to loss of teeth and to anomalies in height of occlusion. The lower first molar teeth keep the mandible in the right place regarding the maxilla, in anterio-posterior and vertical aspect. The loss of the first molar upper teeth leads to the shortening and narrowing of the upper alveolar arch, which causes asymmetry of alveolar arches and occlusion anomalies (3, 5, 12, 14).

The aim of the paper was evaluation of the state, prophylactic and therapeutic needs concerning the first molar teeth in 7-year-old children.

MATERIAL AND METHODS

Dentition state in 176 seven-year-old children living in Lublin province, who were admitted to the Department of Paedodontics of the Medical University of Lublin was evaluated. Studies were conducted from January to September 2005. The children were divided into three groups. Among them were 122 children living in the big town, 16 in the small town and 38 in the city. Children living in the big town make 69.3% of all the examined people in this age group. In every region children were divided according to sex. There were 100 girls and 76 boys.

The studies were conducted in the Department of Paedodontics by dentists according to WHO rules – with the use of a mirror and a probe in artificial light. Studies results were written on examination charts. The number of erupted first molar teeth, caries frequency, caries intensity (CDF), mean values of caries, defect, filling, therapeutic index F/ (C + F), number of varnished teeth, number of teeth which needed to be varnished and which needed extensive varnishing, number of teeth for conservative treatment, for canal treatment and for extraction were studied. Results were presented in tables and figures. Statistic analysis was conducted with use of X^2, Pearson's and U Mann-Whitney's tests at $P<0.05$.

RESULTS

Table 1a presents percentage contribution of erupted first molar teeth according to sex of the children. In the examined population there were four erupted teeth in 145 children, which makes 82.4% of all the patients. In 14 children (8.1%) there was no erupted molar tooth. In the examined group of 7-year-old children there were on average 3.52 erupted first molar teeth. A little pigher was the number of erupted teeth in girls (3.53) than in boys (3.50), which confirms the regularity

of early dentition in girls. Most of all molar teeth erupted in children from the small town (3.81), the least from the big town (3.43). Statistically there was no difference in sex and place of living.

Table 1a. Percentage of erupted first molar teeth in 7-year-old children regarding sex

Number of erupted first molar teeth	Girls		Boys		Number of children in the group	% of children in the group
	number	%	number	%		
0	7	7.00%	7	9.21%	14	8.10%
1	0	0.00%	1	1.32%	1	0.66%
2	8	8.00%	2	2.63%	10	5.31%
3	3	3.00%	3	3.95%	6	3.48%
4	82	82.00%	63	82.89%	145	82.45%
Total	100		76		176	

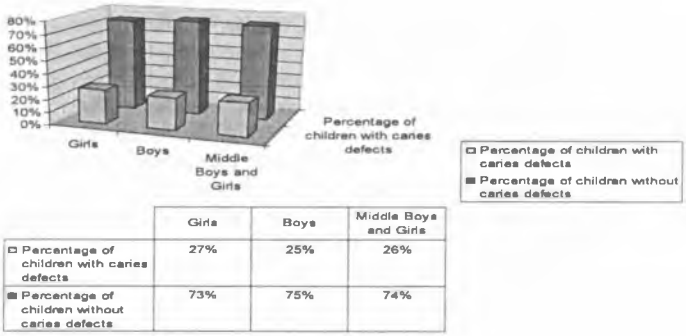
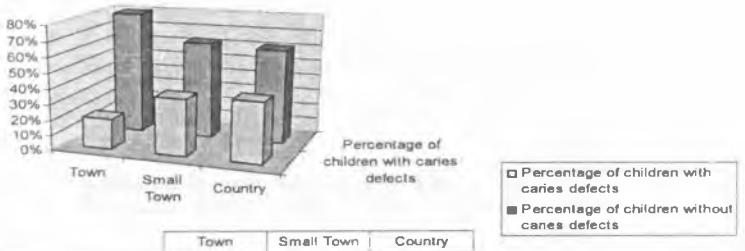


Fig. 1a. Percentage of children with caries of first molar teeth regarding sex

Figure 1a evaluates the frequency of caries in the first molar teeth in population of 7-year-old children. Children with carietic defects make on average 26% of the population. Higher frequency of caries (27%) concerns girls, lower (25%) – boys. Comparing the number of children with carietic defects in every environment we concluded that the smallest number concerns children from the town (20%) (Fig. 1b). In small towns 37% of 7-year-old children' population have carietic defects, in the country – 39%.

Table 1b. Condition of first molar teeth in 7-year-old children. Mean values of C, D and F and CDF index regarding sex and place of living

Sex	Place of living	Caries		Extracted		Filled		CDF	
Girls	town	0.50	0.59	0.00	0.00	0.24	0.29	0.74	0.88
	small town	0.89		0.00		0.56		1.44	
	village	0.74		0.00		0.35		1.09	
Boys	town	0.28	0.49	0.00	0.00	0.19	0.16	0.46	0.64
	small town	1.00		0.00		0.14		1.14	
	village	1.00		0.00		0.07		1.07	
Middle		0.55		0.00		0.23		0.78	



	Town	Small Town	Country
Percentage of children with caries defects	20%	37%	39%
Percentage of children without caries defects	80%	63%	61%

Fig. 1b. Percentage of children with caries of first molar teeth regarding place of living: the town, small town, the country

Table 1b presents data of caries intensity – CDF index, with special regard of mean C, D and F values. Mean CDF index in the examined population was 0.78. CDF in girls was a little bigger in girls (0.88) than in boys (0.64). This is connected with earlier eruption of teeth in girls. The difference of CDF in town and the country was statistically important. CDF in children from big towns was 0.61 and was positively lower than in children from small towns – 1.31 and from the country – 1.07. Mean number of carietic defects in the examined population was 0.55. More defects were in girls – 0.59, less in boys – 0.49. The difference between the town and the country was statistically important (0.4 to 0.84).

There was no first molar tooth for extraction in the examined population. We found more teeth with filling in girls (0.29), than in boys (0.16).

The examined population has on average 1.18 first molar varnished tooth. Girls had more varnished teeth (1.31) than boys (1.00). The difference between the number of varnished teeth in the town and the country was statistically important (1.37 to 0.6). This dependence is presented in Figure 2a.

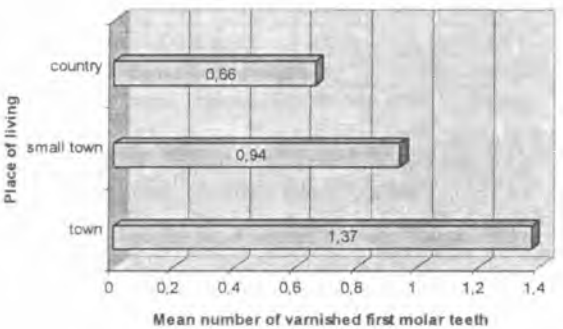


Fig. 2a. Mean number of varnished first molar teeth in 7-year-old children in the town, small town and in the country

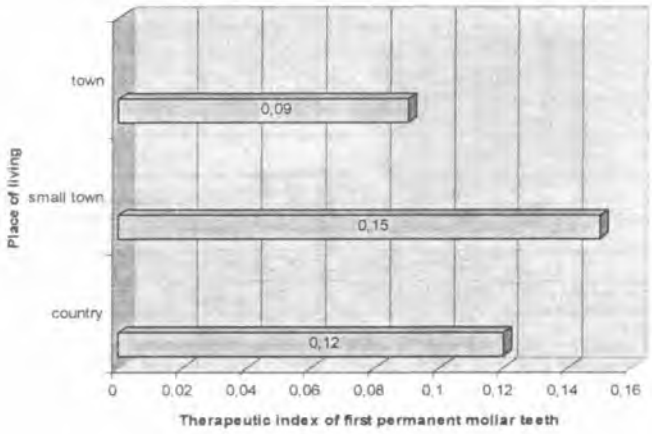


Fig. 2b. Therapeutic index of first permanent molar teeth – in the town, small town and the country

Figure 2b presents therapeutic index in all groups of 7-year-old children. It was 0.10 and was a little bigger in girls (0.11) than in boys (0.09). That difference was not statistically significant.

The difference of therapeutic index in towns and the country in the examined population is presented in Figure 2b.

Table 1c. Prophylactic and therapeutic needs of 7-year-old children concerning first molar teeth regarding sex and place of living

Sex	Place of living	Varnishing		Extended varnishing		Filling		Canal treat-ment		Extraction	
Girls	town	1.15	1.34	0.09	0.08	0.40	0.47	0.01	0.04	0.00	0.00
	small town	1.22		0.00		0.78		0.11		0.00	
	village	1.96		0.09		0.57		0.09		0.00	
Boys	town	1.81	1.86	0.02	0.01	0.26	0.47	0.00	0.00	0.00	0.00
	small town	2.00		0.00		1.00		0.00		0.00	
	village	1.93		0.00		1.00		0.00		0.00	
Middle		1.56		0.05		0.47		0.02		0.00	

Table 1c presents prophylactic and therapeutic needs of first molar teeth in 7-year-old children. On the average 1.56 first molar teeth in the examined population needed varnishing, 0.05 extensive varnishing, 0.47 filling and 0.02 canal treatment. None of the examined children needed extraction of first molar teeth. Boys had bigger needs of varnishing (1.86) than girls (1.34). That difference was statistically significant. The same number of first molar teeth in boys and girls needed filling (0.47), canal treatment was necessary only in the group of girls (0.47).

DISCUSSION

Starting evaluation of condition and prophylactic-therapeutic needs of first molar teeth in 7-year-old children we must turn attention to their great importance in the normal development of

stomatognathic system. Carietic process concerning first molar teeth at the age of 7, so early after their eruption, testifies to big susceptibility of these teeth to caries (3, 5).

In the beginning we evaluated the percentage of erupted first molar teeth in 7-year-olds. In the examined group children had 91.90% of erupted first molar teeth. In 8.1% of children there was no first molar tooth in the oral cavity. Comparing the literature data we found that our examined children had a little smaller number of erupted first molar teeth than 7-year-old children in 2002 (97.39%), and bigger than in 1995 (81.65%) (2, 15). In our own studies the girls had 93% of erupted first molar teeth and boys had 90.79%. Higher percentages were in 2002: girls – 95.84%, boys – 98.56%, lower in 1995: girls – 88.9%, boys – 74.45%. Other authors confirm this rule (1, 4, 5, 8, 9, 13).

The studies of eruption process of permanent teeth were conducted over many years in a few Polish towns. Comparing study results from each year in Poland with our results we observe a trend for earlier eruption of permanent teeth, which is connected with earlier puberty, better nutrition and betterment of health of the community (1, 2, 4, 5, 6, 8, 9, 15). Mean number of erupted sixth teeth in 7-year-old children depending on sex and place of living was evaluated. In our studies that number was 3.52 for both groups, in girls 3.53 in boys 3.50. For comparison the mean number of erupted teeth in Lublin district was 3.9 in 2002.

The percentage of children with active carietic process was 26% for the whole population of 7-year-old children. We compared data from Lublin province when percentage of children with carietic defects in 1995 was 39.1% and in 1996 – 40.15%. In our material girls had more carietic defects than boys, which is consistent with other studies. In Lublin district in 1994 the frequency of caries in girls was 53.3%, in boys – 27%. It was higher than now, especially if we take girls into account (2005 – 27%). It testifies to betterment of dentition state in 7-year-old children in Lublin province. Caries frequency was the highest in the country in Lublin province in 2005 – 39%, in Lublin province in 1995 – 45%, in Wrocław province in 1995 – 32%, in Warszawa province in 1995 – 46%. It is high and dentists speak about the necessity of promotion of prophylactic-therapeutic activities in these provinces (2, 3, 4, 5, 10).

In Lublin province in 1995 children had less teeth varnished (0.98) than in 2005 – 1.18. In the compared years more girls (1.09 and 1.31) had first molar teeth varnished than boys (0.84 and 1.00). The geatest number of varnished teeth in our group we stated in the town 1.37. These data tell about better prophylaxis in our province.

In the studied group of 7-year-old children the index of caries intensity (CDF) was 0.78. It was lower than in studies on Lublin province in 1994 (1.06) and similar to CDF value from 2003 (0.85). CDF in girls has lowered from 1.50 to 0.88, but in boys it is steady – about 0.63–0.64. In all provinces CDF is higher in girls than in boys because of earlier eruption of first molar teeth in girls. CDF in children from big towns was lower in the study group (0.61) than in the country and small towns (2, 3, 5). Lower intensity of caries results from evident betterment of dentition state.

Comparing our mean number of first molar teeth with caries in Lublin province in 1994 with the examined population we found out it has lowered from 1.00 to 0.55 (3). In the studies from 2003 it was 0.71 (11). Analysing value of D factor we did not state extracted first molar tooth, in all the examined and being compared regions, beside one case in studies from 2003 in Lublin province (D = 0.01) (11).

The number of filled defects in the examined group 0.02 was higher than in studies on Lublin province from 1994 – 0.06 and from 2003 – 0.13 and equal to the number of defects on studies in Lublin province from 1995 – 0.02 (2, 3, 11).

Therapeutic index also grew up. In the examined children it was 0.10 and was higher in Lublin province in 1994 (0.05). Similar values were in Lublin studies from 2003 (0.12). The twofold growth of therapeutic index and number of filled defects in our region is beneficial and tells about betterment of dental care, similarly as all over Poland (3, 11).

Prophylactic and therapeutic needs of first permanent teeth were also evaluated. Among the examined children 1.56 of tooth needed varnishing, less than in 2003 (2.46). In our studies boys had greatest needs of varnishing (1.86) and children from the country – 1.94 (11).

In the examined group 0.5 molar teeth needed conservative treatment, more than in other regions. Most of teeth for conservative treatment were in children living in the country (0.8). In that group were 4 girls with one tooth for canal treatment.

Dentition state in 7-year-old children in Lublin province is unsatisfactory, especially in the country. There should be initiated intensive prophylactic-therapeutic activities to diminish frequency of caries in the group of 7-year-olds in our province. Betterment of dental care should refer especially to the country and small towns.

CONCLUSIONS

1. There is a trend to earlier eruption of first molar teeth.
2. Higher percentage of caries defects concerns children living in small towns and in the country than in big cities.
3. CDF index is higher in girls than in boys in all regions.
4. Boys have higher need of teeth varnishing than girls.
5. Lower therapeutic index was stated in boys than in girls. The highest therapeutic index is in small towns, the lowest in big cities.

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SUMMARY

The aim of the paper was evaluation of the state, prophylactic and therapeutic needs concerning the first molar teeth in 176 7-year-old children living in Lublin province, who were patients of the Department of Paedodontics of Medical University of Lublin. The studies were conducted from January to September 2005. We evaluated: the frequency of caries in the examined population, the intensity of caries using number Caries-Defect-Filling (CDF), effectiveness of therapeutic services based on therapeutic index and prophylactic-therapeutic needs concerning the first molar teeth according to sex and place of living of the children. We stated a higher percent age of children with carietic dentition living in the small town and in the country, lower in the big town. Mean CDF of the first molar teeth was higher in girls than in boys in each analysed region. The highest value of CDF concerned girls from the small town, the smallest – boys from the big town. The lowest therapeutic index was stated in boys from village regions. Boys have greater need of dental varnish than girls. The smallest number of the first molar teeth for filling is in children from towns. Four teeth in girls needed root canal therapy. We did not find teeth destined for extraction.

Potrzeby profilaktyczne i lecznicze dotyczące pierwszych zębów trzonowych u dzieci 7-letnich będących pacjentami Zakładu Stomatologii Wieku Rozwojowego AM w Lublinie

Celem pracy jest ocena stanu, potrzeb profilaktycznych i leczniczych pierwszych zębów trzonowych u 176 dzieci 7-letnich z województwa lubelskiego, będących pacjentami Zakładu Stomatologii Wieku Rozwojowego AM w Lublinie. Badania przeprowadzone były w okresie od stycznia do września 2005 roku. Oceniano frekwencję próchnicy w badanej populacji, intensywność próchnicy przy użyciu wartości liczby PUW, skuteczność świadczeń leczniczych na podstawie wskaźnika leczenia oraz potrzeby profilaktyczne i lecznicze dotyczące pierwszych zębów trzonowych, biorąc pod uwagę płeć i miejsce zamieszkania dzieci. Stwierdzono wyższy odsetek dzieci z uzębieniem próchnicowym zamieszkujących w małym mieście i na wsi, niższy w dużym mieście. Średnie PUW pierwszych stałych trzonowców było wyższe u dziewcząt niż u chłopców we wszystkich analizowanych rejonach. Najwyższa liczba PUW dotyczyła dziewcząt z małego miasteczka, najniższa chłopców z dużego miasta. Najniższy wskaźnik leczenia stwierdzono u chłopców z rejonów wiejskich. Większą potrzebę lakowania mają chłopcy niż dziewczęta. Najmniejsza liczba pierwszych zębów trzonowych do wypełnienia występuje u dzieci miejskich. Tylko cztery zęby wymagały leczenia kanałowego. Dotyczyło ono tylko dziewcząt. Nie stwierdzono zębów przeznaczonych do ekstrakcji.