

## CARIES EXPERIENCE IN CHILDREN WITH SEVERE EARLY CHILDHOOD CARIES

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### ABSTRACT

**Introduction** Caries experience indexes in children with severe early childhood caries (S-ECC) reported in literature are lower in the general population than in children referred to paediatric dental clinics. The aim of the study was to compare different samples of children (two samples from dental clinics and one from general population) from this point of view. **Methods** Retrospective analysis upon 3 samples of children 5 years old or under: sample A – 685 children (392 boys, 293 girls) referred to Pedodontics Department, Faculty of Dentistry, Carol Davila University, Bucharest, sample B – 233 children (124 boys, 109 girls) examined in a private dental clinic and sample C – 552 children (284 boys, 268 girls) from 12 kindergartens from Bucharest. Prevalence index (IpS-ECC) and caries experience indexes (*dmft*, *dmfs* and *SiC*) from S-ECC children were evaluated. Caries topography was also noted. Data were analyzed using a chi-square test ( $p < 0.05$ ). **Results** a) IpS-ECC – sample A = 40.29% (IpS-ECC<sub>boys</sub> = 39.79%, IpS-ECC<sub>girls</sub> = 40.95%, NS), sample B = 38.18% (IpS-ECC<sub>boys</sub> = 40.32%, IpS-ECC<sub>girls</sub> = 35.77%, NS), sample C = 15.04 (IpS-ECC<sub>boys</sub> = 17.25%, IpS-ECC<sub>girls</sub> = 12.68%, NS); b) *dmft* index: sample A = 9.14±4.51, sample B = 8.54±3.82, sample C = 9.11±3.35 (NS); c) *dmfs* index: sample A = 21.92±14.54, sample B = 18.43±11.96, sample C = 17.65±9.37 (NS); d) *SiC*: sample A = 14.38, sample B = 13.00, sample C = 12.60 (NS); e) Children with caries in upper and lower molars and front teeth (rampant caries) : - sample A = 23.91%, sample B = 19.10%, sample C = 19.28%. **Conclusions** 1) Although S-ECC is more prevalent in children referred to state or private clinic, the severity of caries experience is the same across all samples; 2) There are no differences between the sexes with regard to the prevalence index and caries experience indexes.

### INTRODUCTION

Caries experience indexes in children with severe early childhood caries (S-ECC) reported in literature are lower in the general population than in children referred to paediatric dental clinics. The aim of the study was to compare different samples of children (two samples from dental clinics and one sample from the general population) from this point of view.

### MATERIALS AND METHODS.

Sample A consisted of 685 children (392 boys, 293 girls) aged 1 to 71 months (mean age=3.9±1.4 years) referred to the Pedodontics Department, Carol Davila University, Bucharest during 2002-2006. Sample B consisted of 233 children (124

boys, 109 girls) aged 3 to 71 months (mean age=4.1±1.4 years) examined and treated in a private dental clinic in Bucharest during 2003-2007. Sample C included 552 children (284 boys, 268 girls), aged 25 to 71 months (mean age=4.4±0.7 years) from 12 public kindergartens in Bucharest.

A retrospective study using patients' files was done in samples A and B. Patients' examination at the first visit was conducted by one investigator (A.M.) in a dental office.

The examination of children from kindergartens was performed by 4 doctors, who were calibrated before this. Children's examination was done in kindergartens, under natural light, using dental probes and mirrors. Dental caries were detected by visual examination and the dental explorer was used

only when needed. No X-rays were taken.

A child was diagnosed with S-ECC when the following criteria were fulfilled: children younger than 3 years – the presence of any sign of decay on smooth tooth surface; in children aged 3 to 5 years – one or more decayed, filled or missing smooth surfaces on the upper front teeth.

Prevalence index for S-ECC and caries experience indexes (*dmft*, *dmfs* and *SiC*) in S-ECC children were calculated. The topography of the lesions was also recorded.

Statistical analysis was performed using a chi-square test. The level of statistical significance was set at  $p < 0.05$ .

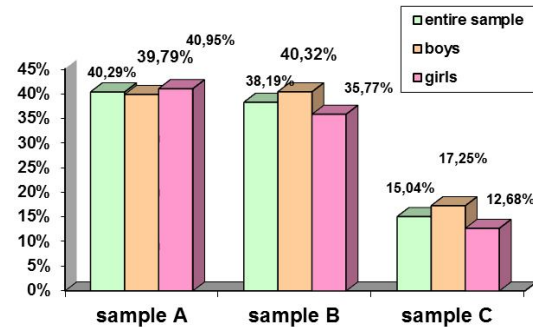
**RESULTS**

**1. S-ECC prevalence (IpS-ECC)**

IpS-ECC for children referred to the Pedodontics Department was 40.29%. The 276 children with S-ECC were aged 12 to 71 months, mean age  $3.4 \pm 1.3$  years. 38.19% of the 233 children in the private dental clinic had S-ECC. The 89 patients with S-ECC were aged between 16 and 70 months, mean age  $4.0 \pm 1.3$  years. In kindergarten children the value of IpS-ECC was the lowest – 15.04%. The 83 children with S-ECC were aged 40 to 71 months, mean age  $4.6 \pm 0.6$  years.

In children examined at the state clinic, the value of the prevalence index was sensibly equal in both sexes (boys – 39%, girls –

40%), whereas in the other 2 samples, the prevalence index was higher in boys as compared to girls, but the differences were not statistically significant in either sample ( $p > 0.05$ ) (Fig. 1).



**Fig. 1. Sex distribution of IpS-ECC**

**2. Caries experience indexes**

The values of the *dmft* index are similar across the 3 samples. Instead, the values of the *dmfs* index are different from one sample to the other: 21.55 in sample A, 18.43 in sample B and 17.65 in sample C, although the differences are not statistically significant ( $p > 0.05$ ). *SiC* (Significant Index Caries) – calculated for 1/3 of children with the highest values of *dmft* index – had close values, without differences statistically significant between samples (Table 1).

Although there are some differences between the values obtained for the girls and for the boys, these are not statistically significant (Table II).

	<i>dmft</i>			SiC	<i>dmfs</i>		
	mean value	p	range		mean value	p	range
Sample A	9.14±5.51	NS	2-20	14.38	21.92±14.54	NS	2-77
Sample B	8.54±3.82		2-18	13.00	18.43±11.96		2-64
Sample C	9.11±3.35		2-16	12.60	17.65±9.37		2-43

**Table 1. Caries experience indexes**

	<i>dmft</i>			<i>dmfs</i>		
	boys	girls	p	boys	girls	p
Sample A	9.25±4.49	9.50±4.55	NS	21.66±14.39	21.40±14.11	NS
Sample B	8.44±3.73	8.67±3.98	NS	19.06±13.35	17.62±10.01	NS
Sample C	9.57±3.10	8.44±3.63	NS	17.35±8.06	18.09±11.10	NS

**Table 2. Sex distribution of caries experience indexes**

### 3. Caries topography

Most children in all study samples had caries both in the upper front teeth, and in the molars. In all samples, the percentage of children with rampant caries (also involving the lower front teeth) was around 20% (Fig. 2).

Although rampant caries were more prevalent in boys than in girls in all samples, differences are not statistically significant (Table 3).

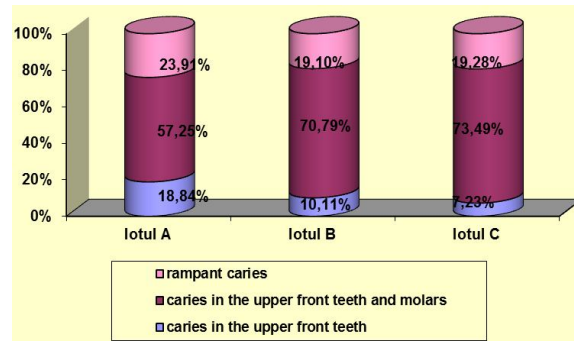


Fig. 2. Caries topography

		Sample A		Sample B		Sample C	
		boys	girls	boys	girls	boys	girls
S-ECC		156	120	50	39	49	34
Rampant caries	Nr.	40	26	10	7	11	5
	%	25.64	21.67	20	17.95	22.45	14.71
p		NS		NS		NS	

Table 3. Sex distribution of rampant caries

### DISCUSSION

There are no comparative studies in the literature concerning the severity of S-ECC in children referred to specialised clinics (state or private) and in children from the general population. This is why the purpose of this study was to compare various samples of children from this point of view.

The analysis of S-ECC at the 2 clinics shows that the prevalence indexes were approximately equal – 40.29% (the state clinic) and 38.19% (the private clinic). The peer-reviewed literature includes few studies on the prevalence of S-ECC in children examined at dental clinics, and the values of indexes ranges between 11 and 94% [1-3].

The studies investigating the frequency of S-ECC in children from the general population are much more numerous. They report values of the prevalence index ranging between 7 and 50% [4-12]. The present study provided a prevalence index of 15.04%, which is higher than the index reported in studies conducted in such countries as Italy, Australia or USA [4-6], yet lower than the indexes reported in studies conducted in

Sudan, Croatia, South Africa, Brazil, Korea or Iran [7-12].

Regarding the gender-related distribution of IpS-ECC, our study showed that in sample A the values were almost equal, and in children examined at the private clinic (sample B) and in kindergarten children (sample C), the prevalence index was higher in boys than in girls, although the differences were not statistically significant. The results of our study are concordant with the results reported by other authors. Thus, Iida *et al.* (2007) reported in a study conducted in a sample of 1,576 children aged 2 to 5 in the USA, the same value of IpS-ECC for both sexes (10%) [6]. Hallet and O'Rourke (2006) found that in children referred to a paediatric hospital for specialised dental therapy, the S-ECC percentage had the same value in girls and boys (96%) [3]. Viridi *et al.* (2010) showed, in a study conducted in a sample of 709 Indian children aged 1 to 5, a prevalence index of the S-ECC higher in girls than in boys (43.8% as compared to 40.6%), although the differences were not statistically significant [2]. Nevertheless, studies

conducted in Turkey reported a higher prevalence of the disease in boys, supported by the tendency in Asian cultures for overindulging boys [13, 14]. Likewise, a study conducted in Brazil showed that boys were more affected by S-ECC. Authors suggested that mothers play an important role in the establishment of sweetness preference in their children and boys may be favoured with more sweets [15].

With regard to caries experience indexes in children with S-ECC, the results show that the number of damaged teeth was similar throughout the 3 samples (9 teeth as an average), while the number of decayed, filled or missing smooth surfaces was higher in children examined at the university clinic (21.55) as compared to the private clinic (18.43) or the kindergarten children (17.65),

with no statistically significant differences.

In a study by Hallet and O'Rourke (2006), the mean value found for the *dmft* index was  $10.5 \pm 3.8$ , close to the value found in our study, but the value of the *dmfs* index was much higher ( $27.1 \pm 15.1$ ) [3].

In a study upon 117 children aged below 4 from Beijing (China), Qin *et al.* (2008) reported that the mean value of the *dmft* index was  $9.2 \pm 3.6$  (similar to our results), whereas the value of the *dmfs* index was lower ( $15.5 \pm 7.7$ ) [16].

The values of the caries experience indexes calculated for the children in the general population (sample C) are similar to the values reported in studies conducted in Sudan and Lithuania [7, 17], though much higher than in studies conducted in Belgium or Italy [4, 18] (Table IV).

Authors (year)	Country/city	No.	Age	<i>dmft</i>	<i>dmfs</i>
Present study (sample C) (2006)	Romania/Bucharest	83	40-71 months	$9.11 \pm 3.35$	$17.65 \pm 9.37$
De Grauwe et al. (2004) [18]	Belgium/Ghent	47	24-35 months	-	$5.98 \pm 5.467$
Petti et al. (2000) [4]	Italy/Rome	114	3-5 years	$6.9 \pm 4.2$	-
Slabsinskiene et al. (2010) [17]	Lithuania/Kaunas	62	3 years	$7.8 \pm 0.1$	$18.1 \pm 0.6$
FathEl Rahman & Ibrahim (2008) [7]	Sudan/Khartoum	140	3-5 years	8.12	19.15

**Table 4. Caries experience indexes in S-ECC children from general population**

In all 3 study samples, there are no statistically significant differences concerning the *dmft/dmfs* indexes between sexes. Hallet and O'Rourke (2006) also reached the same conclusion for the *dmfs* index (25.7 in boys and 26.8 in girls) [3].

The comparison between the three study samples showed high prevalence indexes, with almost equal values in children referred to the state clinic and the private clinic, as compared to the prevalence indexes found in the general population. On the other hand, the

severity of the clinical appearance in children with this pattern of caries, both referred to dental offices and from the general population, was equally high, posing real problems in oral rehabilitation, which supports the need for implementing community prevention programs.

## CONCLUSIONS

1. Although S-ECC is more prevalent in children referred to state or private dental clinic, the severity of caries experience is

- the same in all samples; regarding the prevalence index and the  
2. There are no differences between sexes caries experience indexes.

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