LITHUANIAN UNIVERSITY OF HEALTH SCIENCES
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EARLY CHILDHOOD CARIES TREATMENT UNDER GENERAL ANAESTHESIA AND ITS IMPACT ON CHILDREN'S ORAL HEALTH-RELATED QUALITY OF LIFE

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ANKSTYVOS VAIKYSTĖS DANTŲ ĖDUONIES GYDYMO BENDROJOJE NEJAUTROJE YPATUMAI IR ĮTAKA PACIENTŲ GYVENIMO KOKYBEI

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ABBREVIATIONS

CI	–	Confidence interval
DGA	–	Dental general anaesthesia
dmfs	–	Decayed, missing and filled surfaces of primary teeth
dmft	–	Decayed, missing and filled primary teeth
ds	–	Decayed surfaces of primary teeth
dt	–	Decayed primary teeth
ECC	–	Early Childhood Caries
ECOHIS	–	The Early Childhood Oral Health Impact Scale
FIS	–	Family Impact Scale
fs	–	Filled surfaces of primary teeth
ft	–	Filled primary teeth
GA	–	General anaesthesia
ICDAS	–	The International caries detection and assessment system
LUHS	–	Lithuanian University of Health Sciences
mt	–	Missing primary teeth
ms	–	Missing surfaces of primary teeth
MV	–	Mean value
NCL	–	New caries lesions
OR	–	Odds ratio
OHRQoL	–	Oral health-related quality of life
p	–	Level of significance
P-CPQ	–	Parental-Caregivers Perceptions Questionnaire
SD	–	Standard deviation
Silness-Loe (PI)	–	The Oral Hygiene Index
WHO	–	World Health Organization

INTRODUCTION

Early childhood caries (ECC) is one of the most common health problems among toddlers and preschool-age children. Although the majority of children are able to receive dental treatment in a conventional setting, some patients fail to respond to the usual behaviour management techniques and must therefore be treated under dental general anaesthesia (DGA). DGA is an efficient treatment modality, since a full mouth rehabilitation can be performed in a single appointment and it requires little or no cooperation from the patient. DGA treatment is indicated when a child is unable to accept dental treatment under local anaesthesia due to young age, dental fear, uncooperative behaviour, complex medical/physical/mental conditions, a need for extensive treatment (e.g., surgical procedures), and other reasons. The majority of young children referred to DGA are otherwise healthy. DGA is considered only as the last option, because general anaesthesia may pose risks for the patient's overall health. It is also a costly and resource-intensive method and therefore requires clear evidence of its benefits for children and their families.

Assessing the outcome of full mouth rehabilitation under general anaesthesia (GA) requires an evaluation of children's oral health-related quality of life (OHRQoL). Because DGA treatment is commonly performed in one session, measuring the effect of the treatment on a patient's OHRQoL is possible. Several OHRQoL measures have been developed for use among children. The Early Childhood Oral Health Impact Scale (ECOHIS) is the one designed for children of preschool age and younger and recently short-form versions of the Parental-Caregiver Perceptions Questionnaire (P-CPQ) and the Family Impact Scale (FIS) have been introduced. The original English version of the ECOHIS has been translated into other languages and has been successfully used in different countries. Furthermore, it has also been found to be sensitive and responsive to DGA treatment effects. Recent studies of the impact of DGA treatment on children's OHRQoL have shown significant improvement in oral health and psychological, social and overall wellbeing as well as a positive impact on the family. Therefore, DGA treatment is greatly appreciated by children's parents.

Despite the fact that GA provides optimal conditions for dental treatment, high failure rates for restorations placed under GA are reported

in the literature. Moreover, children, affected by ECC, are highly susceptible to developing new and recurrent caries lesions, and recent studies have demonstrated high relapse rates for young DGA patients. Interest has now shifted to factors, affecting the clinical outcome of ECC treatment under GA.

In Lithuania, childhood dental caries is common: the prevalence of ECC in Lithuania is very high in international terms. Dental care under GA is provided mostly at the university hospitals in the largest cities and at some private clinics. Although studies have explored risk factors for ECC and its prevalence as well as its behavioural, clinical and microbiological characteristics, little information is available regarding DGA treatment in children in Lithuania. The impact of dental caries and DGA treatment on the quality of life of children in Lithuania and their families has not yet been studied. No data on postoperative oral health status of DGA-treated children exist.

Comprehensive information about DGA treatment provided for young children at the Lithuanian University of Health Sciences Hospital would be helpful for quality assessment and betterment of these dental health services for children in Lithuania.

Aim of the study

The general aim of the study was to assess dental general anaesthesia treatment, provided for young children with early childhood cariesat the Lithuanian University of Health Sciences Hospital, and to evaluate the impact of the treatment on children's oral health-related quality of life.

Objectives of the study

1. To describe the reasons for dental general anaesthesia treatment among children under the age of six years.
2. To evaluate oral health status among children under the age of six years receiving dental general anaesthesia treatment.
3. To describe dental treatments provided for children under general anaesthesia and explore parental satisfaction with the treatment performed.
4. To examine the oral health-related quality of life among young Lithuanian children in need of dental general anaesthesia treatment and

analyse the impact of this treatment on children's oral health-related quality of life.

5. To assess children's oral health status six months after their dental general anaesthesia treatment.

Scientific novelty

Little information is available on DGA treatment in children in Lithuania. The impact of dental caries and DGA treatment on the quality of life of Lithuanian children and their families has not yet been studied in relation to the absence of a valid instrument measuring children's OHRQoL available in Lithuanian. No data on children's oral health status after DGA treatment seem to exist either.

This study offers systematic information about DGA treatment provided for young children at the Lithuanian University of Health Sciences Hospital. A lithuanian version of quality of life questionnaire, prepared for this study, has enabled evaluation of OHRQoL among children, suffering from severe dental caries, and assessment of the associated changes following DGA treatment. Children's OHRQoL was measured one month and six months after DGA treatment, enabling to assess whether the effect of the treatment was stable. The study also provides new data about oral health status among young children prior to and six months after DGA treatment, using a prospective design which is rare among studies, exploring the outcomes of DGA.

1. MATERIAL AND METHODS

1.1. Study design

A prospective clinical follow-up study of oral health status and OHRQoL among children receiving DGA treatment.

1.2. Participants

The study includedchild patients under the age of six years receiving DGA treatment during a three-year period from 2010 to 2012 at the Lithuanian University of Health Sciences Hospital in Kaunas, Lithuania. All the patients were referred to DGA treatment from the Department of

Preventive and Paediatric Dentistry (LUHS) after a consultation appointment with a specialist of pediatric dentistry. A total of 144 patients participated in the study (patients with developmental disorders and general diseases (n = 26) were excluded).

1.3. Data collection

The study consisted of children's clinical dental examinations, a questionnaire based survey among the parents, and data collection from the patients' files (Fig. 1.3.1). The data included patients' personal background, reasons for DGA treatment, children's oral health status, children's oral health-related quality of life and dental treatment provided. The study was voluntary, and the parents gave their written consent.

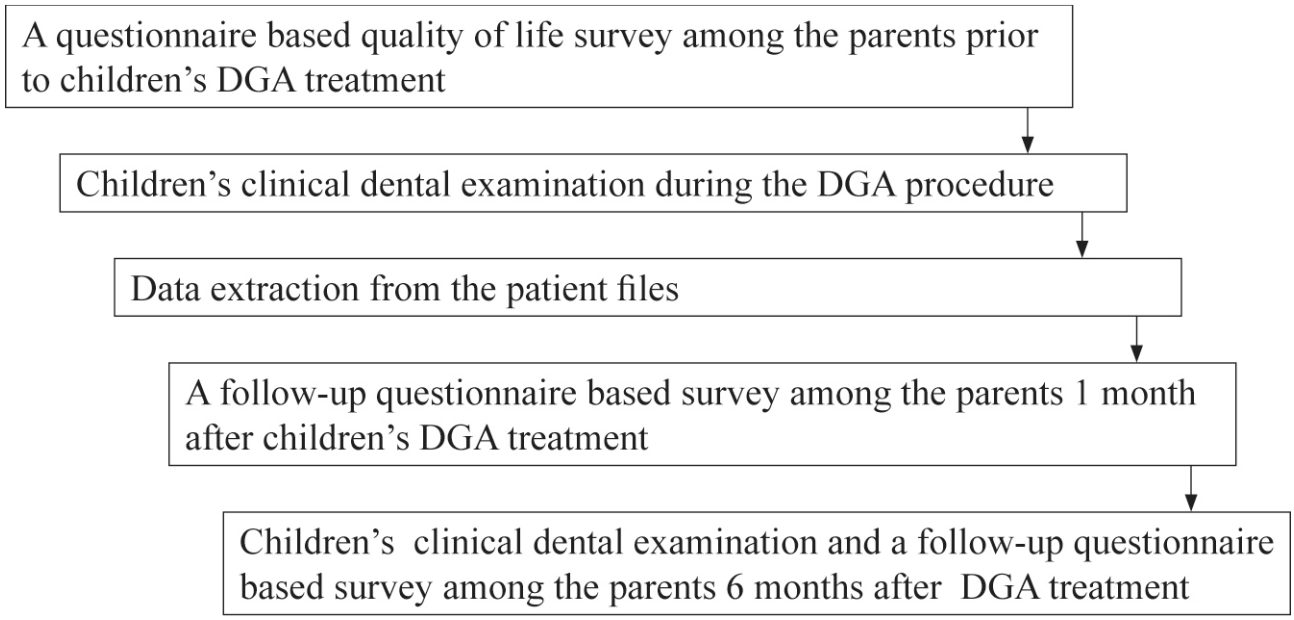


Fig. 1.3.1. *Flowchart of the study*

The personal background data included gender, age (in months), parents' education (university, college, secondary, primary), area of residence (city, town, small town, village) and whether the child had previously undergone DGA treatment. The patient records stated the reasons for referring the child to DGA treatment. The children were treated under GA due to their inability to accept treatment under local anaesthesia. Reasons for referring a healthy child to DGA in the LUHS Hospital were as follows: immaturity of the child, dental fear and uncooperativeness, excessive need for treatment (multiple reasons were allowed).

1.4. Baseline clinical examination

Clinical dental examination was performed during the GA procedure. This was done in a standardized manner according to written instructions. The teeth were first assessed while wet and then after drying with compressed air. A dental mirror and a WHO periodontal probe served as visual-tactile aids in assessing the surfaces. The clinical examinations were conducted by two examiners with high reproducibility (inter- and intra-examiner kappas > 0.8).

The International Caries Detection and Assessment System (ICDAS) was used for caries assessment. ICDAS includes early enamel caries lesions according to the stage of their progression and categorizes the 'obvious' dentine caries lesions according to their progression. The two digit ICDAS codes were determined for each tooth surface of the primary dentition (Table 1.4.1). The first digit of the ICDAS code describes the restoration or sealant (if present), and the second digit is the actual caries code. Unerupted teeth and teeth missing due to caries or other reasons were also recorded.

Table 1.4.1. *Codes and description of ICDAS II*

1st digit codes	**Description**	**2nd digit codes**	**Description**
0	Sound	0	Sound
1	Sealant, partial	1	First visual change in enamel
2	Sealant, full	2	Distinct visual change in enamel
3	Tooth coloured restorations	3	Localized enamel breakdown
4	Amalgam restoration	4	Underlying dark shadow from dentin
5	Stainless steel crown	5	Distinct cavity with visible dentin
6	Porcelain or gold or PFM crown or veneer	6	Extensive distinct cavity with visible dentin
7	Lost or broken restoration		
8	Temporary restoration		
Special codes	Description		
96	Tooth surface cannot be examined		
97	Tooth missing because of caries		
98	Tooth missing for other reasons		
99	Unerupted		

Oral hygiene status was assessed by Silness-Loe plaque index (PI). The probe was slid along the surface of each tooth, and the findings were recorded in points:0 = no plaque, 1 = plaque is located on gums and tooth neck area, 2 = plaque is visible on tooth neck area and interdentally, 3 = plaque covers the entire surface of a tooth. The PI was calculated by adding the scores and dividing them by the number of teeth assessed. The index was scored as follows: 0 = excellent oral hygiene, from 0.1 to 0.9 = good, from 1.0 to 1.9 = satisfactory, and from 2.0 to 3.0 = poor.

Intraoral radiographs prior to GA were unavailable because of the poor cooperation of patients. No intraoral radiographs were possible during GA due to the limited facilities in the operating room.

1.5. Dental treatment

A full dental rehabilitation was performed in a single GA session. The data on dental treatment (number of restorations, pulp treatments, extractions and preventive procedures) and duration of GA were recorded. Glass-ionomer cements and composite resins served as restoration materials. Vital teeth with pulpal involvement underwent pulpotomy and were restored; if bleeding during the pulpotomy procedure persisted for more than five minutes, the tooth was extracted. No pulpectomies or pulp cappings were performed for primary teeth. Teeth with non-vital pulp were extracted. Preventive procedures included professional tooth cleaning, topical fluoride applications, and fissure sealants if permanent molars were present.

1.6. Evaluation of oral health status at a six months recall

Six months after the DGA treatment the patients together with their parents were invited to the clinic for the child's dental check-up. If the patients' parents failed to attend the appointment, they were telephoned and invited again (the reminders were done twice). Dental examinations were performed by the same examiners as in the baseline. The difference from the baseline examination was, that only obvious caries lesions (ICDAS caries code 3 or >) were recorded at the follow-up, since measuring noncavitated enamel lesions would have required more time and more cooperation from a child. Information on caries relapse was recorded, including relapse rate and number of teeth affected. Relapse was defined as the presence of new obvious caries lesion (NCL) (ICDAS caries code 3 or >) on a previously untreated primary tooth or tooth surface. Secondary caries at the margins of a restoration was excluded as a criterion for stating relapse.

Children who failed to cooperate during the check-up were excluded from the follow-up study.

1.7. Quality of life survey

On the day of DGA at the hospital, each patient's parent/caregiver received a self-administered questionnaire measuring OHRQoL. The questionnaire enquired about the child's oral state and wellbeing over the past three months. The follow-up survey used the same questionnaire one month and six months after the undergone DGA treatment: the patients' parents were invited to the clinic to participate in the follow-up survey related to the child's oral condition after the treatment.

The survey tool for assessing children's OHRQoL was the previously developed and pretested Lithuanian version of the ECOHIS. The ECOHIS consists of 13 questions relevant to preschool-age children. The survey questionnaire relies on parental ratings of the 13 items grouped in two main parts: the child impact section and the family impact section. The child impact section covers four domains: child symptoms (1 item), child functions (4 items), child psychology (2 items), and child self-image and social interaction (2 items). The family impact section covers two domains: parental distress (2 items) and family function (2 items). Each question asks about the frequency of an oral health-related problem and is scored on a scale from 0–5, as follows: never (score 0), hardly ever (score 1), occasionally (score 2), often (score 3), very often (score 4), don't know (score 5).

Our questionnaire included two additional general questions about the oral health and general wellbeing of the child, as in the original ECOHIS, using a Likert scale. The first general question included in the baseline and follow-up surveys, "How would you rate the health of your child's teeth, lips, jaws and mouth?", had five answer options: 'excellent', 'very good', 'good', 'fair' or 'poor' (score 1–5). The second general question at baseline was a modification of the original ECOHIS: "How much does the condition of your child's teeth, lips, jaws or mouth affect his/her overall wellbeing?"; its four response options were: 'not at all', 'some', 'a lot' or 'very much' (score 0–3). At the follow-up, parents were asked about any change in child's overall wellbeing since the treatment; the three answer options were: 'stayed the same', 'changed a little' or 'changed a lot' (score 1–3). In addition, at the follow-up, three supplementary questions enquired the parents about their satisfaction with the treatment itself, information

provided prior to the treatment, and whether the parents would consider another DGA treatment if needed.

1.8. Data analysis

Children's age was categorized into two categories based on child maturity and distribution: < 4 years and 4–6 years. Parental education was also dichotomised based on the distribution: high education (university) and others (college, secondary) (there were no parents with primary education).

In the analyses of the caries indices, ICDAS II caries codes were used to record the d-component of the dmft/dmfs index as defined by WHO. ICDAS caries codes 1 and 2 were counted together as a measure of non-cavitated enamel caries d(1−2) and 3, 4, 5, and 6 as obvious caries lesions d(3-6). The caries experience (d(1-6)mft, d(3-6)mft) was calculated as the total number of teeth with caries lesions (dt) and treated caries (ft) and missing teeth (mt) due to caries. Obvious caries lesions were categorised into 2 categories: moderate decay (ICDAS caries codes 3 and 4) and severe (extensive) decay (ICDAS caries codes 5 and 6).

DGA treatments were categorized according to the severity of the disease and rated as follows: filling due to caries (caries treatment) (1 point), pulp treatment (pulpotomy) (2 points), extraction (3 points). The individual treatment index (TI) was calculated as the sum of the points for fillings, pulp treatments and extractions for each patient. The sum of the points divided by the number of treated children provided the mean TI.

To measure OHRQoL, we added up the item scores to create a total ECOHIS score; the higher the score, the greater the impact on quality of life. 'Don't know' responses were recoded as missing. For those with up to 30% missing responses, we imputed a score for the missing items as the average of the remaining items of the questionnaire. Questionnaires with more than 30% missing responses were excluded from the analysis. We calculated the total scores for the whole ECOHIS, the child and family sections and the following domains: child symptoms, child function, child psychology, child social wellbeing, parent distress, and family function. Because each domain and section contained different numbers of items, we also calculated standardized scores (scores/item) (total score divided by the number of questions in the domain/section).

We then determined the magnitude of change in OHRQoL after DGA treatment by subtracting the ECOHIS scores at follow-up from those at baseline. The same calculations were made for the child and family sections as well as all the domains of ECOHIS. The effect size was calculated by dividing the mean of change score by the standard deviation of the baseline score. An effect of < 0.2 indicated a small, but clinically meaningful magnitude of change, 0.2–0.7 a moderate change and > 0.7 a large change.

1.9. Statistical analysis

The data were analysed using the Statistical Package for Social Sciences program for Windows (SPSS, version 17). Descriptive results of variables were presented as median or mean ± standard deviation (SD). All the variables were tested for normal distribution. The Student's (t) test, Chi-square and Mann-Whitney tests as well as logistic regression modelling served for statistical analyses. The Wilcoxon signed-rank test served to compare baseline and follow-up scores of the ECOHIS and test the statistical significance of the changes. The McNemar test was used to compare prevalence of the most frequently reported impacts at baseline and follow-up.

A p value <0.05 was considered to be statistically significant.

1.10. Ethical consideration

The Kaunas Regional Research Ethics Committee approved the study (No. BE-2-19, Date: 04/11/2009). State Data Protection Inspectorate permission was given (No. 2R-732).

2. RESULTS

A total of 144 children (79 boys and 65 girls) under six years of age (range: 25–71 months) were treated under GA for dental reasons at the LUHS Hospital between 2010 and 2012. Table 2.1. shows the patients' characteristics by age: more than half (54.2%) of the children were under four years of age, and 40% of them resided in cities. Nearly half (47%) of

the parents had higher education, and none had lower than secondary education. 15% of the children had a history of previous DGA (Table 2.1).

Table 2.1. *Characteristics of the patients (n = 144) who received dental treatment under GA in 2010–2012 by age group.*

Characteristics of patients	**Total**	**<4 years**	**4–6 years**	**p value**
	(n=144) %	**(n=78) %**	**(n=66) %**	
Gender				
Male	54.9	53.8	56.1	0.79
Female	45.1	46.2	43.9	
Area of residence				
City	39.6	41.0	37.9	<0.001
Town	19.4	20.5	18.2	
Small town	20.1	30.8	7.6	
Village	20.8	7.7	36.4	
Parental education				
High	47.2	52.6	40.9	0.253
College	35.4	29.5	42.4	
Secondary	17.4	17.9	16.7	
Previous DGA	15.3	10.3	21.2	0.069

Statistical evaluation by chi-square tests for differences by age group.

2.1. Reasons for dental general anaesthesia

The majority ofthe children (81%) had multiple (2 or 3) reasons for DGA (Table 2.1.1). More than half (52.1%) of them were referred to DGA due to dental fear and uncooperative behaviour, as well as the need for complex treatment.

Table 2.1.1. *Reasons for dental treatment under GA among the patients (n = 144)*

Combinations of the reasons for DGA	Reasons for DGA		
	Immaturity of a child (1)	Dental fear and uncooperativeness (2)	A need for complex dental treatment (3)
	n (%)		
	2 (1.5)	8 (5.6)	17 (11.9)
1 & 3	30 (20.8)		30 (20.8)
2 & 3		75 (52.1)	75 (52.1)
1 & 2 & 3	12 (8.3)	12 (8.3)	12 (8.3)

2.2. Oral health at baseline

DGA patients mostly exhibited untreated caries (mean d(3-6)t = 12.1) and low numbers of previously filled (mean ft = 0.2) or extracted teeth (mean mt = 0.6) (Table 2.2.1). The majority of the patients (80%) had poor oral hygiene (Silness Loe PI ≥ 2).

Table 2.2.1. *Dental caries experience at baseline (N=144).*

dmft		dt		mt	ft
d(1-6)mft	d(3-6)mft	d(1-6)t	d(3-6)t		
MV(SD)					
14.4 (3.5)	12.9 (3.5)	13.7 (4.1)	12.1 (3.9)	0.6 (1.5)	0.2 (0.8)
dmfs		ds		ms	fs
d(1-6)mfs	d(3-6)mfs	d(1-6)s	d(3-6)s		
MV(SD)					
38.8 (17.9)	35.3 (15.9)	35.6 (15.9)	32.13 (15.6)	2.8 (6.8)	0.4 (1.0)

MV – mean, SD – standard deviation.

Among all teeth with caries lesions (1975 caries affected teeth in total) 63% of teeth presented with severe (extensive) decay, moderate decay was observed in 14% of teeth, whereas early stage decay (enamel caries) was observed in 23% of teeth. First primary molars were the most frequently

affected teeth, while lower incisors and canines were the least affected (Fig. 2.2.1).

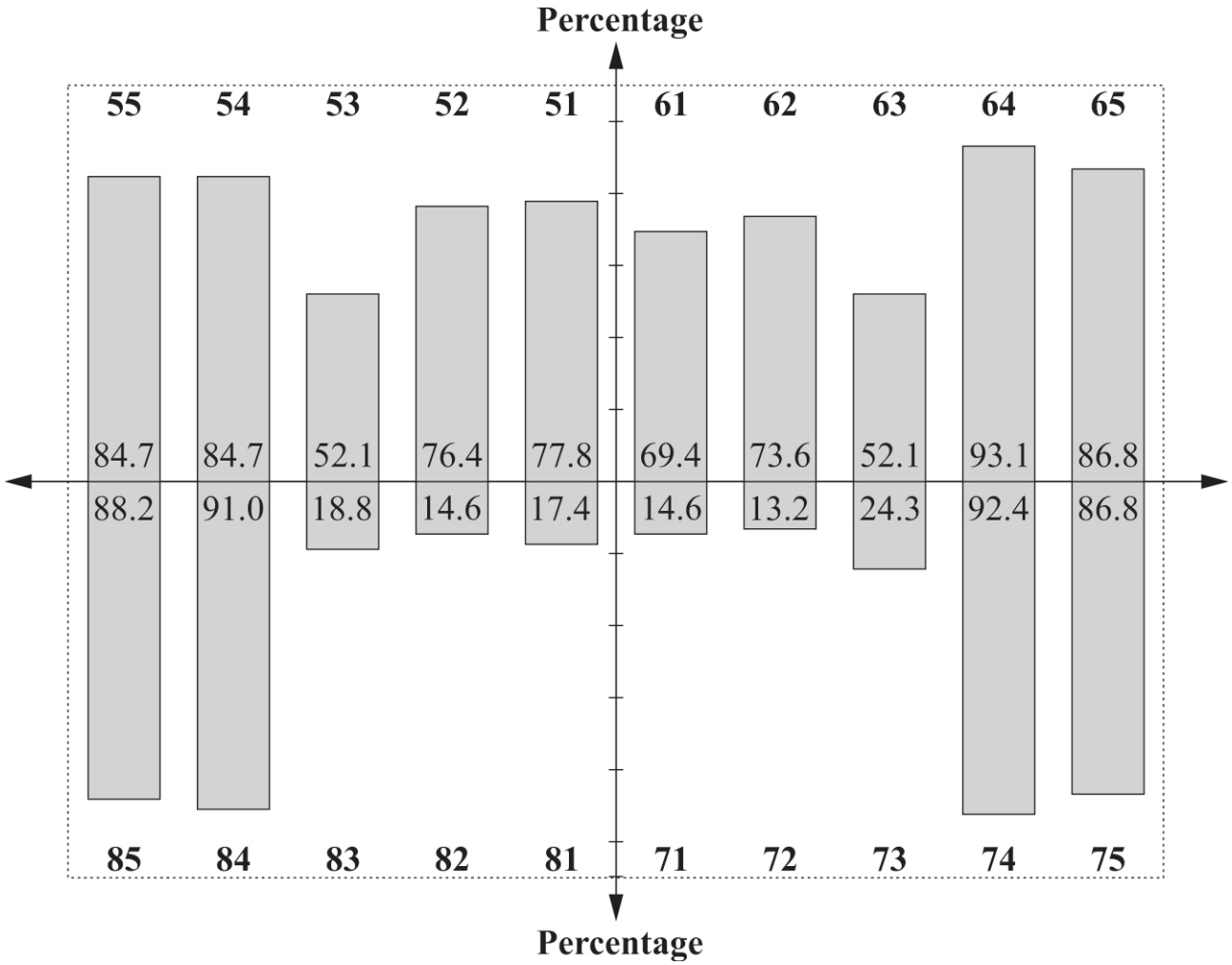


Fig. 2.2.1.*Percentage of caries-affected primary teeth*

2.3. DGA treatments

The duration of DGA treatment ranged from 35 to 180 (mean 94.3±30.6) minutes. Of the 1975 primary teeth treated under GA, 50% were restored, 32% extracted, and 18% targeted with preventive procedures. Of the restored teeth, 12% underwent endodontic treatment. Fig. 2.3.1 summarizes the percentages of children who received each type of treatment. Extractions were more frequent among the 4–6-year-old children than those under 4 years old (p=0.003).

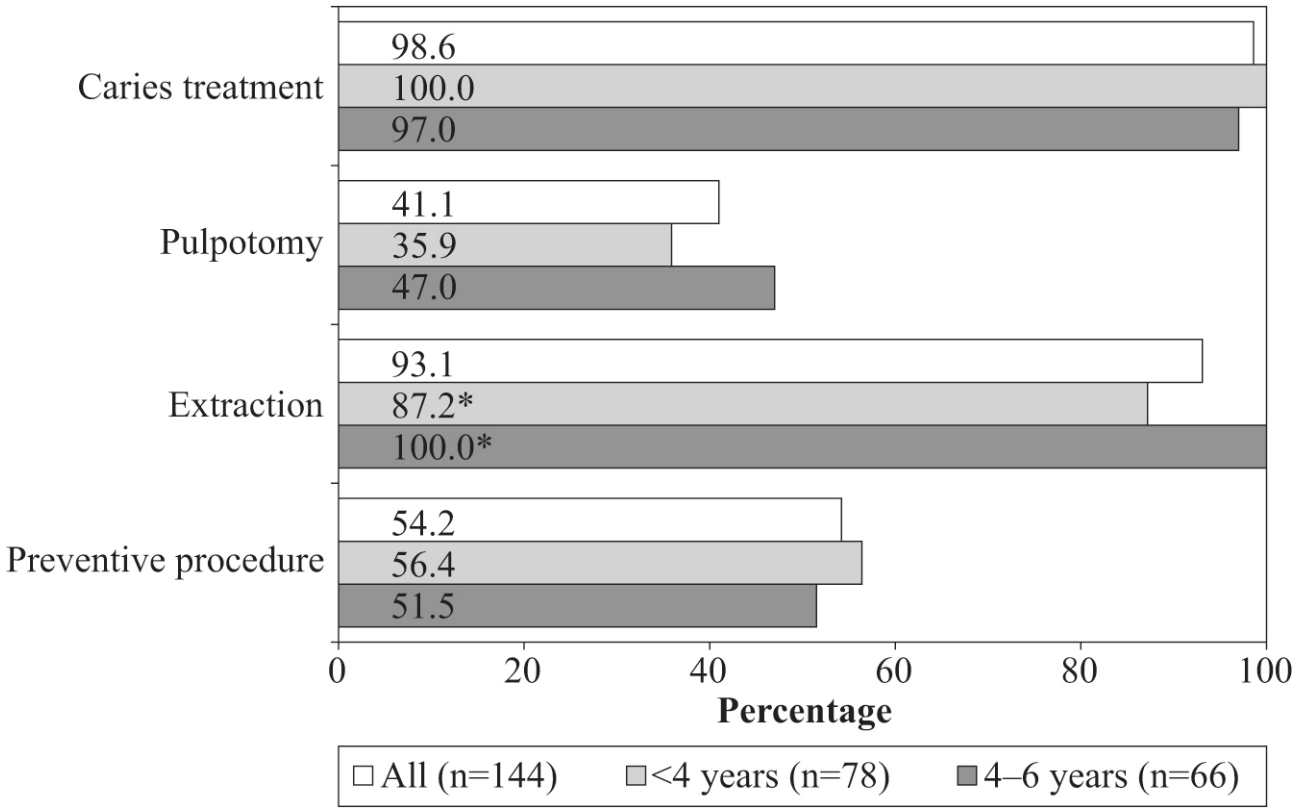
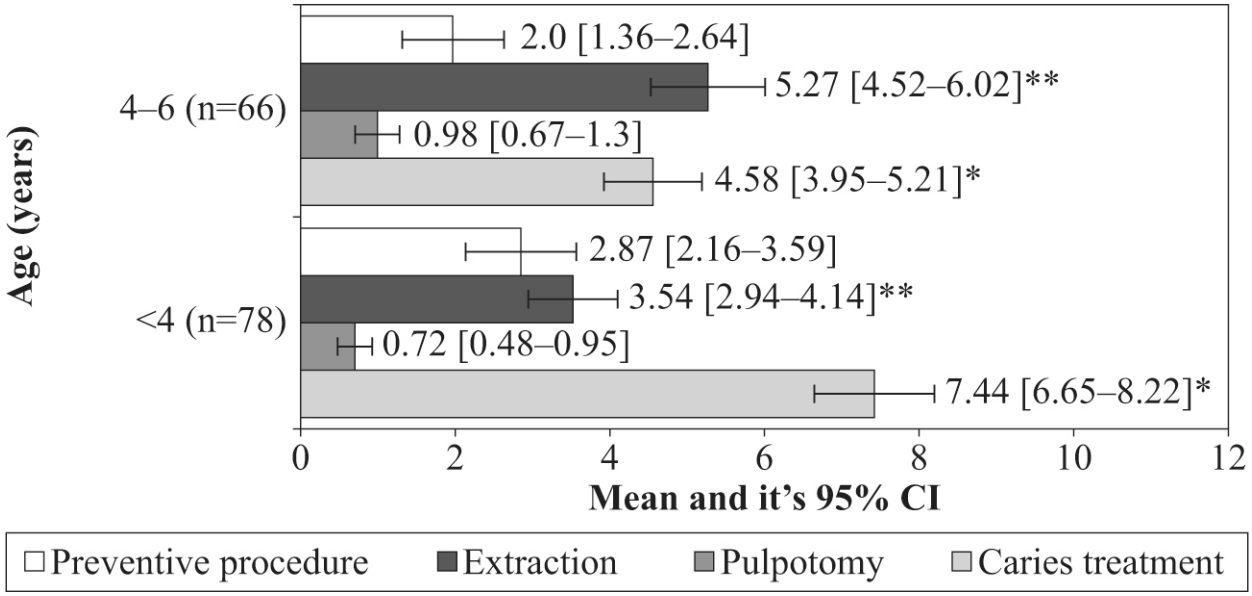


Fig. 2.3.1. *Percentages of DGA patients receiving various treatments by age group*

The average number of treatments provided per patient was as follows: 6.13 (3.41) fillings, 0.84 (1.16) pulpotomies, 4.33 (2.96) extractions and 2.47 (2.93) preventive procedures. Fig. 2.3.2 summarizes the average number of treatments provided per patient. 4–6-year-old children received more extractions ($p<0.001$), but less caries treatments ($p=0.001$) than those under 4 years old. We found no significant differences in the number of pulpotomies and preventive procedures between the two age groups.



*,** p≤0.001, Mann-Whitney test.

Fig. 2.3.2. *The average number of treatments by age group*

The treatment index ranged from 3 to 51 (mean TI = 20.3 ± 9.6). The logistic regression model showed that the older age of a child and a more rural place of residence had a significant link with a higher extent of DGA treatment (TI > 21) (Table 2.3.1).

Table 2.3.1. *Patient background factors (age, parental education, area of residence) predicting the extent of DGA treatment (TI > 21) shown by the logistic regression model*

Parameter		Estimate of strength		Odds ratio (OR) and its 95% confidence interval (CI)		p value
		Estimate	SE	OR	95%CI	
Age:	<4 years=no, >4years=yes	0.074	0.020	1.077	1.035–1.120	<0.001
Parent education:	high=no, other=yes	0.649	0.364	1.914	0.937–3.907	0.075
Area of residence:	city*=no, village**=yes	0.836	0.374	2.307	1.108–4.804	0.026
Constant		–4.097	0.989	0.017		

* > 10 000 inhabitants, ** < 10 000 inhabitants.

2.4. Oral health-related quality of life

All (N=144) patients participated in the baseline survey, but four patients were excluded from the OHRQoL analysis due to having more than 30% missing answers in the baseline questionnaire. Fig. 2.4.1 illustrates the pre-treatment scores of total ECOHIS and its domains. The parents reported more family impacts than child impacts. The domain of parental distress had the highest score, whereas the score for the social wellbeing domain was the lowest of the ECOHIS domains.

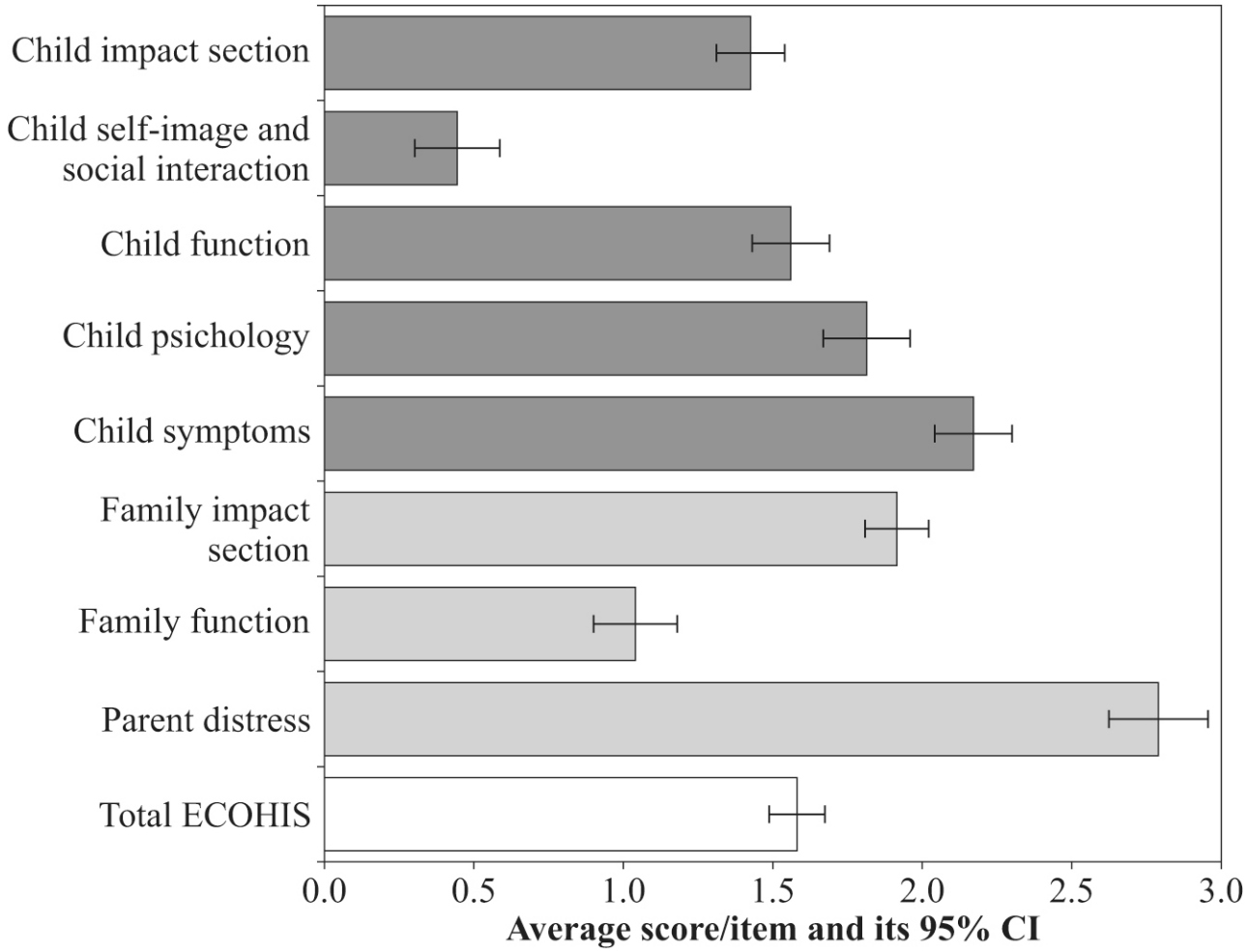


Fig. 2.4.1. *Mean overall and domain scores in the ECOHIS at baseline (N=140)*

The ECOHIS scores were associated with patient gender, age and parental education level (Table 2.4.1). The parents reported greater impacts on boys than on girls. Older children (4–6 years) experienced more pain than the younger ones, but the impact on the family was greater

if the child was under four years. Children with highly educated parents had lower scores in the child impact section.

Table 2.4.1. *Pre-treatment ECOHIS scores by patients' background (N=140).*

	Gender		**Age (years)**		**Parental education**	
	Male (n=75)	**Female (n=65)**	**<4 (n=74)**	**4–6 (n=66)**	**High (n=68)**	**Other[a] (n=72)**
Total ECOHIS	21.7 (8.5)	18.9 (6.6)*	20.5 (9.2)	20.4 (5.8)	18.6 (6.2)	22.2 (8.6)*
Child impact section	13.7 (6.8)	11.8 (5.2)	12.4 (7.2)	13.2 (4.9)	10.8 (4.5)	14.7 (6.9)**
Child symptoms	2.1 (1.1)	2.1 (1.1)	1.9 (1.2)	2.3 (1.0)*	1.8 (1.0)	2.4 (1.1)*
Child functions	6.7 (3.3)	5.6 (2.7)*	6.0 (3.5)	6.5 (2.6)	5.6 (2.6)	6.8 (3.4)*
Child psychology	3.8 (1.9)	3.5 (1.5)	3.5 (1.8)	3.8 (1.7)	3.0 (1.5)	4.2 (1.8)**
Child self-image and social interaction	1.1 (1.8)	0.6 (1.4)	0.9 (1.8)	0.7 (1.4)	0.4 (0.7)	1.3 (2.1)*
Family impact section	8.0 (2.7)	7.2 (2.6)*	8.1 (2.8)	7.0 (2.3)*	7.8 (2.4)	7.5 (2.9)
Parent distress	5.7 (1.9)	5.4 (2.1)	5.8 (2.2)	5.3 (1.8)	5.8 (2.1)	5.4 (1.9)
Family function	2.3 (1.9)	1.7 (1.3)*	2.3 (1.9)	1.7 (1.1)*	2.0 (1.6)	2.1 (1.7)

Values are mean scale score (brackets contain standard deviation).
[a]Other = College or secondary; *$p<0.05$; Independent samples t-test; **$p<0.001$; Independent samples t-test.

We obtained a complete data set for 122 (84.7%) patients in the 1 month's follow-up and 118 (81.9%) patients in the 6 month's follow-up.

Table 2.4.2 shows changes in ECOHIS scores from baseline to follow-up. The total ECOHIS and its subscale scores decreased significantly after the DGA treatment, demonstrating large effect sizes. Social wellbeing was the only domain, which demonstrated moderate effect size. The greatest decreases in scores were for the domains of child symptoms and child

psychology in the child section and for the domain of parental distress in the family impact section.

Table 2.4.2. *The mean ECOHIS domain scores at baseline and follow-up with effect sizes (N = 118)*

ECOHIS domains (number of items)	Baseline	After 1 month		After 6 months	
	V (SN)	V (SN)	Effect size	V (SN)	Effect size
Total ECOHIS(13)	1.6 (0.5)*,**	0.5 (0.4)*,***	2.1	0.7 (0.6)**,***	1.8
Child impact section (9)	1.5 (0.6)*,**	0.5 (0.4)*,***	1.6	0.6 (0.6)**,***	1.5
Child symptoms (1)	2.1 (1.1)*,**	0.5 (0.7)*	1.6	0.6 (0.9)**	1.4
Child functions (4)	1.6 (0.7)*,**	0.8 (0.7)*	1.3	0.9 (0.7)**	1.0
Child psychology (2)	1.9 (0.8)*,**	0.4 (0.5)*	1.8	0.4 (0.7)**	1.8
Child self-image and social interaction (2)	0.5 (0.8)*,**	0.1 (0.3)*,***	0.4	0.2 (0.6)***	0.4
Family impact section (4)	1.9 (0.6)*,**	0.5 (0.5)*,***	2.4	0.9 (0.8)***	1.7
Parent distress (2)	2.9 (0.9) *,**	1.0 (1.0)*,***	2.2	1.4 (1.2)***	1.7
Family function (2)	1.1 (0.9) *,**	0.1 (0.3)*,***	1.1	0.3 (0.5)***	0.9

Values are mean scale score (brackets contain standard deviation unless indicated otherwise).
*p<0,001, comparing results at baseline and 1 month follow-up; **p<0,001, comparing results at baseline and 6 months follow-up; ***p<0,05, comparing results at 1 month and 6 months follow-up; Wilcoxon signed-rank test.

Prevalence of the most frequently reported child and family impacts at baseline and follow-up are presented in Table 2.4.3. Pain, eating problems and feeling irritated were the most frequently reported impacts for children, whereas parents feeling upset and guilty were the most common impacts in the family section at baseline. The prevalence of frequently reported impacts decreased significantly at follow-up, the biggest decrease in prevalence was observed for the items of parents feeling upset and guilty. Eating, pronunciation problems and parents feeling guilty were the most frequently reported impacts at follow-up. A bigger decrease in prevalence was seen 1 month after the treatment, comparing to the one observed at the six months follow-up.

Table 2.4.3. *Prevalence of the most frequently reported impacts at baseline and follow-up (N = 118)*

Item	Prevalence of impacts reported 'often' or 'very often'		
	Baseline, %	**After 1 month, %**	**After 6 months, %**
Pain in the teeth mouth and jaws	44.3[*,**]	0[*]	3.4[**]
Difficulty drinking hot or cold beverages	33.6[*,**]	3.3[*]	5.1[**]
Difficulty eating some foods	59.0[*,**]	26.2[*]	27.4[**]
Difficulty pronouncing some words	16.4	18.0	15.4
Missing preschool, daycare or school	8.2[*,**]	0[*]	0[**]
Trouble sleeping	23.8[*,**]	0[*]	0[**]
Being irritable or frustrated	38.5[*,**]	0[*]	0[**]
Avoided smiling or laughing	3.3	3.3	3.4
Avoided talking	0	0	0
Parents being upset	81.1[*,**]	7.4[*,***]	18.8[**,***]
Parents feeling guilty	73.8[*,**]	12.3[*,***]	28.2[**,***]
Parents taking time off from work	13.1[*,**]	0[*]	3.4[**]
Financial impact on the family	9.0[*,**]	0[*]	0[**]

Values are the percentage of parents, reporting the impact "Often" or "Very often". [*]$p<0.05$, comparing results at baseline and 1 month follow-up; [**]$p<0.05$, comparing results at baseline and 6 months follow-up; [***]$p<0.05$, comparing results at 1 month and 6 months follow-up; McNemar test.

More than half of the respondents (57%) rated their child's oral health as good to excellent 1 month after DGA treatment, whereas 84% of them rated it as poor prior to the treatment. 6 months after the treatment 61% of the parents rated their child's oral health as fair. The majority of the parents (82% prior to the treatment and 69% 6 months after the treatment) reported that oral health status affected their child's overall wellbeing considerably. More than half of them (54%) reported a substantial change

in their child's overall wellbeing after the treatment. All parents reported their satisfaction with the DGA treatment. Two-thirds of them (66.4%) felt they had received sufficient information prior to the treatment. More than half of the parents (64.8%) stated they would consider another DGA treatment, if needed.

2.5. Oral health status at the six months follow-up

118 patients participated in the six months follow-up survey (follow-up rate 82%). 10 children were excluded from the clinical data analysis because of uncooperative behaviour at a recall appointment, therefore a final full data set was obtained for 108 (75%) patients.

Table 2.5.1 presents dmft index and its components at baseline and at the six months follow-up. All were significantly higher at follow-up, except for the d component, which was lower at follow-up.

Table 2.5.1.*Dental caries experience at baseline and six months follow-up (N=108).**

	d(3-6)mft	**d(3-6)t**	**mt**	**ft**
	MV(SD)			
Baseline	13.5 (3.1)	12.7 (3.7)	0.6 (1.4)	0.2 (0.5)
Follow-up	14.1 (3.0)	4.3 (3.2)	5.3 (2.9)	4.5 (2.2)

*p<0.001, Paired samples T-test.

Table 2.5.2 shows oral hygiene status at baseline and six months follow-up. The majority of patients had poor to satisfactory oral hygiene at follow-up.

Table 2.5.2. *Oral hygiene status at baseline and six months follow-up (N=108).*

	Oral hygiene		
	Good	**Satisfactory**	**Poor**
Baseline, %	0	15,7	84,3
Follow-up, %	25*	38.9**	36.1***

Z=6,708; *,**,***p<0.001, Wilcoxon test.

Oral hygiene index was significantly lower at the six months follow-up when compared to the one observed at baseline (Table 2.5.3). The mean value of Silness- Loe index was 1.2(0.9).

Table 2.5.3. *Oral hygiene index at baseline and six months follow-up (N=108)*

Silness-Loe index			**p***
Baseline	**Follow-up**	**Change**	
2.2 (0.7)	1.2 (0.9)	0.9 (0.9)	<0.001

*Wilcoxon test.

Out of the 108 patients who were followed-up, 10 children (9.3%) did not develop any new carious lesions (NCL), therefore the relapse rate was 90.7%. The number of NCL ranged from one caries lesion (37.0% of patients) to seven caries lesions (3.7% of patients). 50 patients (54.7%) developed 2 NCL or more. The mean value was 2.2 (1.7) NCL /patient.

Tables 2.5.4 and Table 2.5.5 present the relationship between patient characteristics and the relapse size. A history of previous DGA and being a boy was associated with lower relapse size at the 6 months recall. A higher d(1-6)mft value and poor oral hygiene was associated with higher relapse size. The means of age, d(3-6)mft, number of fillings and extractions were not significantly different between the relapse groups. Area of residence and whether the child had received pulpotomy at GA were not associated with relapse size as well.

Table 2.5.4. *Differences in patients' characteristics between the relapse groups (N=108).*

Parameters	**Relapse size**		**p value**
	≤ 1 NCL (n=50)	**> 1 NCL (n=58)**	
Gender, n(%)			
Male	30(60.0)	23 (39.7)	**0.035****
Female	20 (40.0)	35 (60.3)	
Age, years (MV(SD))	3.8 (0.7)	3.9 (0.9)	0.313*
Parent education, n(%)			
High	26 (52.0)	24 (41.4)	0.270**
Other	24 (48.0)	34 (58.6)	
Area of residence, n(%)			
City	32 (64.0)	27 (46.6)	0.069**
Village	18 (36.0)	31 (53.4)	
Previous DGA, n(%)			
Yes	12 (24.0)	4 (6.9)	**0.013****
No	38 (76.0)	54 (93.1)	

*Independent samples T-test; **Chi-square test.

Table 2.5.5. *Differences in patients' dental health aspects between the relapse groups (N=108)*

Parameters	**Relapse size**		**p value**
	≤ 1 NCL (n=50)	**> 1 NCL (n=58)**	
d(3-6)mft (mean, SD)[a]	13.4 (3.2)	13.6 (3.1)	0.333***
d(1-6)mft (mean, SD)[a]	13.6 (3.2)	15.4 (3.7)	**0.001*****
Extractions (mean,SD)	4.9 (2.3)	4.5 (3.6)	0.457*
Fillings (mean, SD)	7.3 (3.8)	7.3 (3.2)	0.618***
Pulpotomies, n(%)			
Yes	24 (48.0)	15 (25.9)	**0.017****
No	26 (52.0)	3 (74.1)	
TI (Mean, SD)	23.2 (6.7)	19.3 (12.1)	**0.043***
Oral hygiene at follow-up, n(%)			
Excellent/good	39 (78.0)	16 (27.6)	0.001**
Fair/poor	11(22.0)	42 (72.4)	

[a]dmft at baseline; *Independent samples T-test; **Chi-square test; ***Mann-Whitney test.

CONCLUSIONS

1. The need for complex treatment, together with dental fear and uncooperative behaviour were the major reasons for dental general anaesthesia.

2. Very high level of untreated tooth decay and poor oral hygiene was observed among young children receiving dental general anaesthesia treatment in the Lithuanian University of Health Sciences Hospital.

3. Multiple caries treatments and extractions were performed for these patients. Older children (4–6 years) and children from rural areas received a more extensive treatment. The children's parents greatly appreciate this treatment modality.

4. The OHRQoL of young Lithuanian children in need of DGA treatment is seriously impaired. Dental general anaesthesia treatment is associated with significant improvements in the children's OHRQoL and has a positive impact on the family's quality of life.

5. The relapse rate of ECC at the six months recall is very high, and children's oral hygiene is insufficient.

LIST OF AUTHOR'S PUBLICATIONS

1. Jankauskienė B, Narbutaitė J. Changes in Oral Health – Related Quality of Life among Children Following Dental Treatment under General Anaesthesia. A Systematic Review. Stomatologija 2010;12(2):60-4.
2. Jankauskienė B, Narbutaitė J, Kubilius R, Gleiznys A. Adaptation and Validation of the Early Childhood Oral Health Impact Scale(ECOHIS) in Lithuania. Stomatologija 2012;14(4):108-13.
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ABSTRACTS AT SCIENTIFIC CONFERENCES

1. Jankauskiene B, Virtanen JI, Kubilius R, Narbutaite J. „Oral health-related quality of life among children after dental general anaesthesia treatment“. Poster was presented at the EAPD congress, June 4-8, 2014 in Sopot, Poland.

SUMMARY IN LITHUANIAN

Nepaisant dantų ėduonies paplitimo mažėjimo daugelyje išsivysčiusių ir ekonomiškai stiprių šalių, ankstyvos vaikystės dantų ėduonis (AVDĖ) vis dar išlieka viena dažniausių ikimokyklinio amžiaus vaikų ligų. AVDĖ paplitimas svyruoja nuo 1 proc. ekonomiškai stipriose valstybėse iki 97 proc. besivystančiose šalyse. Lietuva priklauso tų šalių grupei, kurių epidemiologinė situacija nėra gera: pusė (50,6 proc.) trejų metų amžiaus vaikų jau turi bent vieną ėduonies pažeistą dantį, dauginio AVDĖ paplitimas 6,5 proc. Remiantis 2012 m. duomenimis, Lietuvos 4–6 metų vaikų pieninių dantų ėduonies paplitimas ir intensyvumas labai aukštas: 90 proc. vaikų turi ėduonies pažeistų dantų, kpi-d – 7,9, vyrauja aktyvaus dantų ėduonies formos.

Daugumai vaikų dantų gydymą pavyksta atlikti įprastinėmis sąlygomis, pasitelkus įvairias elgesio valdymo technikas arba taikant medikamentinę sedaciją. Kai kiti gydymo būdai neefektyvūs ar negali būti pritaikyti, dantų gydymas atliekamas bendrojoje nejautroje. Dantų gydymas bendrojoje nejautroje (DGBN) – efektyvus gydymo būdas, užtikrinantis visą reikalingą gydymą vieno vizito metu ir nereikalaujantis vaiko bendradarbiavimo. Tačiau dėl bendrosios nejautros keliamos rizikos bendrai vaiko sveikatai, DGBN taikomas tik kaip paskutinė išeitis, remiantis iš anksto numatytomis ir griežtai apibrėžtomis indikacijomis. DGBN dažniausiai atliekamas mažiems vaikams, turintiems išplitusį AVDĖ, bijantiems dantų gydymo vaikams ir fizinę ir/ar protinę negalią turintiems vaikams. Įvairiose šalyse DGBN organizavimas ir protokolai skiriasi. Autorių duomenimis, vakarų šalyse vaikų DGBN poreikis didėja.

Nepaisant to, kad bendroji nejautra užtikrina idealias sąlygas restauraciniam dantų gydymui atlikti, yra duomenų, kad restauracijos, atliktos bendrojoje nejautroje nėra tokios sėkmingos, kaip galima tikėtis. Taip pat nustatyta, kad daugumai vaikų, gydytų bendrojoje nejautroje, greitai atsi-

randa naujų ėduonies pažeidimų. Atsižvelgiant į tai, kad bendroji nejautra susijusi su rizika bendrai sveikatai ir yra brangus gydymo metodas, būtina užtikrinti efektyvų dantų gydymą. Kaip vieną iš gydymo baigčių, imta vertinti vaiko burnos sveikatos nulemtą gyvenimo kokybę (BSNGK) po DGBN. Nors dėl skirtingų BSNGK vertinimo instrumentų (klausimynų), šios srities tyrimų rezultatai skiriasi, autorių bendra išvada – DGBN reikšmingai pagerina vaikų BSNGK ir turi teigiamą poveikį vaiko šeimai. Su tuo susijęs teigiamas vaikų tėvų požiūris į šį gydymo metodą ir pasitenkinimas jo rezultatais.

Sistemingų žinių apie Lietuvoje atliekamą vaikų DGBN ir pacientų burnos sveikatos būklę trūksta. DGBN įtaka vaikų BSNGK Lietuvoje netyrinėta. Duomenų apie pacientų burnos sveikatos būklę po DGBN taip pat nėra.

Išsami informacija apie Lietuvos sveikatos mokslų universiteto (LSMU) ligoninėje atliekamą vaikų DGBN, jo efektyvumą ir su tuo susijusius veiksnius padėtų vertinti ir gerinti šių odontologinių paslaugų vaikams kokybę Lietuvoje. Tuo tikslu ir buvo numatytas šis mokslinis tyrimas.

Darbo tikslas ir uždaviniai

Darbo tikslas:

Ištirti Lietuvos sveikatos mokslų universiteto ligoninėje gydomų ikimokyklinio amžiaus vaikų, kuriems atliekamas dantų gydymas bendrojoje nejautroje, burnos sveikatos būklę, gydymo apimtį ir įtaką vaikų gyvenimo kokybei.

Darbo uždaviniai:

1. Įvertinti ikimokyklinio amžiaus vaikų dantų gydymo bendrojoje nejautroje priežastis.
2. Ištirti vaikų, sergančių ankstyvos vaikystės dantų ėduonimi ir gydomų bendrojoje nejautroje, burnos sveikatos būklę.
3. Ištirti dantų gydymo, atliekamo bendrojoje nejautroje, procedūras ir apimtį bei tėvų nuomonę apie atliktą gydymą.
4. Įvertinti vaikų burnos sveikatos nulemtą gyvenimo kokybę prieš dantų gydymą bendrojoje nejautroje ir jos pokyčius po gydymo.
5. Ištirti vaikų burnos sveikatos būklę po dantų gydymo bendrojoje nejautroje praėjus 6 mėnesiams.

Tyrime dalyvavo visi jaunesni nei šešerių metų amžiaus pacientai, atitinkantys atrankos kriterijus (N=144), kuriems 2010–2012 metais buvo atliktas dantų gydymas bendrojoje nejautroje. Duomenys tyrimui buvo renkami iš pacientų medicininių kortelių, atliekant klinikinį vaikų burnos būklės ištyrimą bei jų tėvų anketinę apklausą.

Išvados

1. Pagrindinės dantų gydymo bendrojoje nejautroje vaikams priežastys buvo dantų gydymo baimė bei sudėtingo ir daugelio dantų gydymo poreikis.

2. Bendrojoje nejautroje gydomų vaikų burnos sveikatos būklė bei burnos higiena prasta. Jų dantų ėduonies intensyvumas labai didelis, dominavo negydytas pieninių dantų ėduonis.

3. Dantų plombavimas ir pašalinimas buvo dažniausios bendrojoje nejautroje atliekamos procedūros. Gydymo apimtis ir sudėtingumas buvo didesni vyresnių (4–6 metų) bei gyvenančių kaimo vietovėse vaikų. Tėvai palankiai vertino vaiko dantų gydymą bendrojoje nejautroje ir buvo patenkinti atliktu gydymu.

4. Vaikų, kuriems reikalingas dantų gydymas bendrojoje nejautroje,burnos sveikatos nulemta gyvenimo kokybė labai pažeista. Vaikų burnos sveikatos nulemta gyvenimo kokybė po dantų gydymo bendrojoje nejautroje labai pagerėjo.

5. Praėjus šešiems mėnesiams po dantų gydymo bendrojoje nejautroje, dauguma vaikų turėjo naujų ėduonies pažeidimų ir nepakankamą burnos higieną.

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