

# Changes in oral health-related quality of life among children following dental treatment under general anaesthesia.

## A systematic review *Birute Jankauskiene, Julija Narbutaite*

### SUMMARY

*Aim.* To review the results of studies reporting data on changes in aspects of children's oral health-related quality of life (OHRQoL) following dental treatment under general anaesthesia (GA). To describe instruments measuring children's OHRQoL used in the studies.

*Methods.* A literature review was carried out to identify relevant studies reporting data on changes in aspects of children's OHRQoL following dental treatment under GA. The data was extracted from the selected papers.

*Results.* The review included 11 journal articles, which presented the results of clinical trials. The studies were based on different questionnaires measuring children's OHRQoL and parental satisfaction.

*Conclusions.* Oral rehabilitation under GA results in the immediate improvement of children's oral health and physical, emotional and social quality of life. It also has a positive impact on the family. However, a more accurate comparison of results is not possible due to differences in instruments used. And no single decision exists on the choice of the instrument measuring children's OHRQoL following dental treatment under GA. It may be concluded that further studies on measuring long term OHRQoL changes and studies surveying children are needed.

**Key words:** children, dental treatment, general anaesthesia, quality of life.

### INTRODUCTION

The negative impact of oral diseases, especially early childhood caries (ECC), on quality of life has been known for years [1-5]. Treating a young child with severe dental caries usually is a challenge for dentists, especially when extensive and complex treatment is necessary. Despite the existing behaviour management and pharmacological techniques, there are cases when dental rehabilitation under GA is required to provide safe and effective dental treatment. Full mouth rehabilitation under GA includes: restorative treatment, preventive procedures, extractions. The main reasons for dental treatment under GA are the following: uncooperative behaviour, multiple extractions, extensive dental caries in a young child and dental treatment for all age groups

of children with special needs [6]. The need for such a kind of treatment has been poorly explored. Malden et al reports that 3% of children have had such treatment by the time they are 5 years old [7].

Many studies have investigated the quality of the restorative treatment provided under GA [8-12]. There have been relatively few studies exploring the impact on OHRQoL following dental treatment under GA.

OHRQoL is a concept that describes the impact of the oral health status on general health and everyday life. Measuring children's OHRQoL enables to evaluate the child's oral health status and treatment efficiency [13-15]. Exploring OHRQoL for adults is not a new research field [16-19], but studies assessing it among children following dental treatment under GA have been scarce due to the lack of validated measure. So far, there has been no systematic review published on the topic.

Therefore, the purpose of this article was to review the results of studies reporting data on changes of children's OHRQoL following dental treatment under GA.

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## MATERIALS AND METHODS

### Collection of data, article selection strategy

A systematic literature review was carried out to identify relevant studies reporting data on changes of children's OHRQoL following dental treatment under GA. The literature search covered three Anglophone online databases: PubMed, Cochrane Library, Wiley Interscience. The search was conducted using the Mesh-term and/or text word search or combinations of the following: dental care for children; general anaesthesia; mouth rehabilitation; dental treatment, oral health, quality of life. The survey covered the period from 1978 to October 2009. Two reviewers carried out the selection and evaluation of articles independently. Disagreements were resolved through discussion and consensus.

Irrelevant articles were discarded according to the title or the abstract of the article. Where only a relevant title without a listed abstract was available, a full copy of the publication was assessed for inclusion. Articles were included in the review if they complied with the inclusion criteria. The references of the selected articles were hand searched in order to identify all relevant articles.

### Inclusion criteria

Journal articles presenting data on changes of children's OHRQoL following dental treatment under GA were included in the review. Clinical trials and systematic reviews, with the children of any age being the target population, were considered for inclusion. The search was limited to original articles published in English. The publishing date was not considered as an inclusion criterion.

### Data extraction

Full texts of the selected articles were analyzed. The following data was extracted: publication date, author, setting of the study, type of the study, instrument (questionnaire) used, target population, number of participants, follow up rates, measured outcomes (quality of life, clinical status, parental satisfaction).

## RESULTS

From the initial search results, 69 articles were identified, 11 of which were included in the review. All of them were reports of clinical trials. No systematic review on the topic was identified. Main characteristics of the studies are presented in Table.

### Description of the studies

All selected articles reported results of clinical trials, 10 of which used a pre-experimental study

design and one study used a randomised controlled trial design [20]. The number of participants in the studies ranged from 11 [21] to 228 [22]. The follow-up rate in the studies was between 62.5% [23] and 85.5% [24]. Some studies were one group post-test only studies: the data was collected in a single session, after dental treatment [21,22,25]. In this case questions were asked about the treatment effect, for example: „do you think that oral health of your child improved after dental treatment?“. Other studies used one group pretest-posttest design. Participants were surveyed twice: preoperatively and postoperatively [7,23,24,26-29], i.e. the effect of treatment was evaluated by the researcher who compared the answers to the same questions pre- and postoperatively. The questionnaires in all the studies were filled out by parents. The majority of the authors chose their studies to be set in only one medical institution, usually a public hospital, while one study was performed in a private medical centre, having the required equipment for GA [21]. Few studies [7,20,26,28] were carried out in two hospitals. The target population in most of the studies were otherwise healthy children (without medical conditions). Baens-Ferrer et al [27] studied children with special needs, while Acs et al [22] studied both: healthy children and patients with special needs.

The following information sources were used in the studies: questionnaires, medical records, clinical evaluation data and records of interviews. The data was collected using self administrative questionnaires at the clinic [7] or mailed and filled at home [22], interviewing the parents directly [21] or by telephone [24,28].

The questionnaires measuring children's OHRQoL were different in the studies (Table). A number of studies relied on batteries of questions rather than a validated measure to assess children's OHRQoL [22,24,25,29]. The number of questions in questionnaires ranged from 6 [29] to 49 [7]. Validated instruments were used in the following studies: Versloot et al [26], Malden et al [7], Klaassen et al [20,23].

### Results of the studies

All studies revealed the same results: dental treatment under GA led to improvement in the quality of life of the child in all the aspects considered. No or little change was detected only in few cases. The parents pointed out the child's better physical condition, better sleep, appetite, absence of toothache [24,28]. The quality of life also improved in psychological and social aspects: parents noted of more smiles, better results at school and increased interaction with others [25]. Acs et al [22] focused on 2 groups of patients:

healthy children and children with general diseases to compare the results between the two groups. The author found out that the second group presented a greater improvement in oral health and OHRQoL, especially in terms of the physical aspect, i.e. after dental treatment under GA medically compromised children would eat and sleep better [22].

All authors presented short term results, i.e. changes in the quality of life were assessed shortly (2-11 weeks) after the treatment. No data was found on long term effects of OHRQoL among children after dental treatment under GA.

## DISCUSSION

The assessment of the quality of life of children often includes surveying parents, although special

questionnaires for children in a certain age group have already been developed [30,31].

Who should be surveyed to determine the children's quality of life: children or parents? If the questionnaire is filled out by parents the results greatly depend on the parents' ability to offer an objective assessment of the child's physical and mental state and social wellbeing [32-34]. Barbosa et al [35] has carried out a study on children's and parents' assessment of the child's OHRQoL and their agreement on all the aspects. This study confirms the results of other studies, concluding that the knowledge of some parents about their child's quality of life, especially social and psychologic aspects, is inaccurate and limited. Using specially designed questionnaires a reliable information may be obtained from children themselves [36].

**Table.** Main characteristics of studies

Author, publication date	Study design	Study population	Number of participants		Title of questionnaire, number of questions
			Initial	Final (follow-up rate)	
Low et al, 1999	CT – one group pretest-posttest	Preschool age children	90	77 (85.5%)	Questionnaire for parents/guardians, 10
Acs et al, 2001	CT – one group posttest only	Children (age not defined)	228	- (one stage survey)	One page survey ( 7)
Thomas et al, 2002	CT – one group pretest-posttest	Healthy children 2-7 years of age	Not defined	50	Survey on quality of life, 6
White et al, 2003	CT – one group posttest only	2-5 year old children	45	- (one stage survey)	One page survey, 10
Anderson et al, 2004	CT – one group pretest-posttest	1 - 8 year old children	125	95 (76%)	Structurized questionnaire, based on project „Children's Oral Health Quality of Life“ and previous studies, 18
Baens-Ferrer et al, 2005	CT – one group pretest-posttest	Special needs children of all age groups	73	50 (68.5%)	Franciscan Hospital Children Oral health-related Quality of life questionnaire ( FHC-OHRQOL), 41
Versloot et al, 2006	CT – one group pretest-posttest	Preschool age children	115	70 (60.9%)	“Dental Discomfort Questionnaire” (DDQ), 9
Amin et al, 2006	CT – one group posttest only	Children up to 6 years old	11	- (one stage survey)	Semistructurized individual interviews ( number of questions not defined)
Malden et al, 2008	CT – one group pretest-posttest	Children of all age groups	202	130 (64.4%)	“Parental-Caregivers Perception Questionnaire” (P-CPQ), 35 and “Family Impact Scale” (FIS), 14
Klaassen et al, 2008	CT – one group pretest-posttest	Healthy children up to 8 years old	80	50 (62.5%)	“Parental Perceptions Questionnaire” (P-CPQ), 35 and “Family Impact Scale” (FIS), 14
Klaassen et al, 2009	RCT	Children up to 7 years old	144	104	“Early Childhood Oral Health Impact Scale” (ECOHIS), 13

CT – clinical trial;  
RCT – randomised controlled trial.

Wilson-Genderson et al [37] believe that it would be effective to survey both parents and children to assure the most accurate assessment of the child's quality of life. Despite the fact that parents' information may be incomplete or inaccurate, it is of value, especially when the studies focus on pre-school age children [35,38] and the children treated under GA are mostly of this age. What is interesting though is that none of the authors, reporting on changes of children's OHRQoL after dental treatment under GA, have surveyed children; the results are based only on the parents' opinion even in studies of school age children.

Though design of a randomized controlled trial provides the best clinical evidence, so far there has been only one study of this design in the field [20]. The majority of the studies have only intervention groups but no control groups which makes the results of them less reliable.

A number of the selected studies were based on questionnaires completed after the treatment; others focused on surveys of parents carried out before and after the treatment. Some authors believe that questionnaires before the treatment may lead to significant changes in the results of the second stage questionnaire and affect the overall assessment of the child's quality of life. Klassen et al [20,23] divided the participants into two groups: participants in one of them were surveyed only after the treatment, while others were questioned twice: before and after the treatment. On the basis of his results the author states that changes in the quality of life really occur and are not influenced by filling questionnaires before the treatment.

The studies focused on children in different age groups. Some authors chose pre-school age children as their target population, while others carried out studies on older children and a few did not divide the children by age. A few authors [7,23] to study pre-school age children employed "Parental Perceptions Questionnaire", although this instrument for assessment of OHRQoL was designed for 6 to 14 year olds. A special OHRQoL questionnaire for pre-school age children "Early Childhood Oral Health Impact Scale" (ECOHIS) [39] was developed in 2007. This questionnaire derived from The Child Oral Health Quality of Life (COHQoL) instrument,

developed by Jokovic and Locker [30,38, 40]. Klassen et al [20,23] is the only one who used it for the purpose of measuring children's OHRQoL after dental treatment under GA. The study was based on the two questionnaires and the results indicated similar changes in the quality of life. Moreover, the nature of ECOHIS allows more informative answers, which increases the questionnaire's reliability and promotes its usage in future research.

Although all researchers uniformly state the improvement of children's OHRQL after dental treatment under GA, a number of participants failed to complete the study, which leads to a lack of research or incomplete research of a great deal of population concerned. Could it have a significant effect on the results obtained? So far there has only been one study into whether the participants offer a complete representation of all the children that undergo dental treatment under GA [25]. The author included the characteristic of participants who failed to complete the research. According to the author, the group of those who failed to complete the study had some influence on the study results, but this impact was not significant.

## CONCLUSIONS

1. Children's quality of life after dental treatment under GA improves in physical, psychological and social aspects.
2. Dental treatment under GA has a positive effect on the whole family of the patient and is appreciated by parents.
3. Due to different methods employed by studies to assess the quality of life it is difficult to provide a more accurate comparison of results.
4. There is no general agreement on which questionnaires should be used to analyse changes in children's OHRQoL after dental treatment under GA. It is necessary to standardise the methods of analysis of children's OHRQoL.
5. It is necessary to assess the long term effects of dental treatment under GA on the patients' quality of life.
6. There is a need for studies surveying OHRQoL of school age children with the questionnaires being filled by children and not their parents.

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