Effects of dental and oral examination in children aged 0-5 years

This is an excerpt from the full technical report, which is written in Norwegian.

The excerpt provides the report's main messages in English

No. 25–2015

Systematic review

kunnskapssenteret

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We would like to thank all contributers for their expertise in this project. Norwegian Knowledge Centre for the Health Services assumes final responsibility for the content of this report.

Norwegian Knowledge Centre for the Health Services
Oslo, Desember 2015

Key messages (English)

There is little systematic knowledge about interventions meant to prevent caries in small children. This report is about effects of a first dental and oral examination in children 0-2 years compared to a first dental and oral examination in children 3-5 years regarding prevention of dental caries. We did not find studies that directly answered our question. We found one study that partially answered our question.

The intervention was evaluated in a non-randomized Norwegian study with 312 children.
The results, of very low quality, show that:

- children who had a first dental examination at the age of 2 years, including preventive measures, had better dental status when they were examined again at the age of 3.5 years compared to children who were not examined at the age of 2 years:
    - lower prevalence of dentine caries
    - fewer teeth with dentine caries experience
    - fewer tooth surfaces with dentine caries
    - lower prevalence of enamel caries
- there were no differences between the groups regarding number of tooth surfaces with enamel caries or prevalence of plaque at clinical examination.

The study did not report follow-up of the children's teeth after the examination at 3.5 years of age.

We rated the quality of the documentation as very low for all outcomes and we have very little confidence in the effect estimates.

Our key message is that there is too little information available to draw clear conclusions about the effects of a first dental and oral examination at the age of 2 years compared to a first dental and oral examination in children 3-5 years.

Title:
Effects of dental and oral examination in children aged 0-5 years.

Type of publication:

Systematic review

A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies.

Doesn't answer everything:

- Excludes studies that fall outside of the inclusion criteria
- No health economic evaluation
- No recommendations

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Peer review:

Lars Inge Byrkjeflot, lecturer, Department of clinical dentistry, University of Tromsø.

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Executive summary (English)

Background

Untreated caries is common and a 2010 report shows that 9 % of children aged 0-14 years worldwide are affected, with a peak among 6 year-olds. In Norway data from 2014 show that, on average, 18 % of all 5 year-olds who were examined had caries that required dental filling.

Caries in primary teeth may have many adverse consequences for the child. Pain may led to reduced chewing ability and problems with tooth brushing. Untreated caries may lead to infections that increase the risk of damage to the developing permanent teeth. Extraction of primary teeth may entail change of position of adjacent teeth. Norwegian data from 2003 show that the prevalence of caries is skewed among young children, the highest risk of caries being in children with immigrant and/or low socioeconomic status.

The Norwegian Directorate of Health is preparing a National guideline for dental services to children and adolescents. A review of research literature found little summarized evidence regarding prevention of early childhood dental caries. This report will examine one specific question about the timing of the first dental examination in small children that will contribute to the evidence for the recommendations in the new guideline.

Objective

The aim of this report is to summarize systematically the effect of a first dental and oral examination in children 0-2 years compared to no examination regarding prevention of dental caries.

Method

We searched for randomized and non-randomized controlled studies with at least three measurements before and three measurements after the intervention. We

searched the following electronic databases on June 9, 2015: Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (Ovid) og Pubmed [sb], Embase (Ovid), CINAHL (EBSCO), Swemed+.

Two persons independently assessed publications for inclusion and assessed risk of bias in included studies, using checklists. One person extracted data and one person verified the data extraction. We summarized the results in text and tables. We assessed the quality of the documentation using the GRADE approach (Grading of Recommendations, Assesment, Development, and Evaluation).

Results

We did not find randomized controlled studies that directly satisfied our inclusion criteria. We found one controlled study, published in 2010, with an intervention group and a reference group. The timing of the first dental examination was evaluated in the study, which included 312 children and was carried out in Norway. In addition to examination of the children, information was given to guardians, as required, about tooth brushing: brushing technique, brushing in the evening, and brushing with fluoride-containing toothpaste; about harmful effects of bottle-feeding at night, and about diet. Children who had dental plaques or enamel caries were give fluoride tablets and children who had dentine caries were referred to a dentist.

The results, of very low quality, show that:

- children who had a first dental examination at the age of 2 years, including preventive measures, had better dental status when they were examined again at the age of 3.5 years compared to children who were not examined at the age of 2 years:
    - lower prevalence of dentine caries
    - fewer teeth with dentine caries experience
    - fewer tooth surfaces with dentine caries
    - lower prevalence of enamel caries
- there were no differences between the groups regarding number of tooth surfaces with enamel caries or prevalence of plaque at clinical examination.

The study did not report follow-up of the children's teeth after the examination at 3.5 years of age.

We did not find outcomes on secondary consequences of caries or oral function and possible diagnosis of conditions that may need further follow-up. We did not find outcomes on costs related to the intervention, or harm (e.g. anxiety in children or guardians connected to the examination).

The documentation is based on one small observational study and we rated the quality of as very low for all outcomes.

Discussion

Our systematic literature search, in June 2015, identified one study that partly satisfied the inclusion criteria regarding study design, population, intervention and outcomes. The most important outcome, prevalence of caries, was reported on. The study had one intervention group and one reference group, and the same person examined the children in both groups. Thus measurement of the outcome was not blinded which further weakens the confidence in the results. There was no report on follow-up of the children's teeth after the examination at 3.5 years of age. Further, there was no information about the nine children who did not complete the follow-up examination.

There were other interventions connected to the examination of the children at the age of 2 years: information to significant others as needed, oral fluoride supplementation for children with plaques, and referral to a dentist for children with dentine caries. These interventions reflect practice where interventions are given based on findings during examination. It is however the timing of the first dental examination that justified the inclusion of the study in this systematic review.

Two previous systematic reviews on prevention of caries in children aged 0-5 years concluded that there is insufficient documentation on effects of early dental examination. Only a retrospective registry study included in one of the reviews was relevant to our research question. The literature searches in these systematic reviews were carried out in March and October 2013, respectively. Our systematic review is in accordance with these two reviews.

Conclusion

We included one study, carried out in Norway on 312 children. There is insufficient documentation to draw conclusions about the timing of a first dental and oral examination in children, at age 0-2 years compared to at age 3-5 years.

Several high quality studies with enough participants are needed. It is desirable and possible to carry out randomized controlled trials. In addition to outcomes related to caries, outcomes such as costs associated with the intervention as well as harms (e.g. anxiety in children or guardians connected to the examination) should be investigated. Another area of interest is possible effects of how the intervention is organized, e.g. whether results differ if the intervention is given by dental health personnel or primary health care personnel.