

# Efficacy of Milk Fluoride Prevention of Dental Caries in Children Under 12 Years Old: A Review

Eficacia de la Leche Fluorada en la Prevención de Caries Dentales en Niños Menores de 12 Años: Una Revisión

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TORRES, E. M.; OLIVA, M. P. & LECANNELIER, B. C. Efficacy of milk fluoride prevention of dental caries in children under 12 years old: A review. *Int. J. Odontostomat.*, 10(2):197-206, 2016.

**ABSTRACT:** Dental caries is the most common infectious-contagious worldwide disease that can be prevented with fluoride. Since milk is an important part of children's diets, it is a good choice as vehicle to deliver fluoride. The objective of the study was to determine the efficacy of fluoridated milk as a systemic prevention to prevent dental caries in children under 12 years old. This is a systematic review with narrative analysis. It develops search strategies in all kinds of studies databases without language restrictions. An overview table was done describing: author, method, statistical type, comparison group, outcome type, sample / universe, patient type, intervention type and adverse effect. The results showed that fluoride milk is effective in preventing dental caries. Since milk already contains elements which prevent dental caries, adding the appropriate amount of fluoride would increase the protective effect against them.

**KEY WORDS:** fluoridated milk, dental caries, milk without fluoride.

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## INTRODUCTION

Dental caries is a multi-factorial, highly transmissible disease of dental tissues (Itthagarum *et al.*, 2011) that results from the production of acids in bacterial biofilms (dental plaques) on the tooth surface which causes localized destruction of the teeth (Pratten *et al.*, 2000). The etiology includes elevated colonization levels of mutants streptococci, high frequency sugar consumption, and developmental defects on primary teeth (Tinanoff *et al.*, 2002).

The progression or reversal of the caries process depends on the balance between pathological and protective factors (Itthagarum *et al.*). In some communities dental caries is on the increase, and this may be in part due to increasing use of refined sugars and inadequate exposure to fluoride (Itthagarum *et al.*). World Health Organization reports 60–90 % of schoolchildren worldwide have experienced caries, with the disease being most prevalent in Asian and Latin American countries (Prasai *et al.*, 2013).

The prevalence of early childhood caries increased with age, and the number of sugary snacks

between meals and a cariogenic diet were strongly related to early childhood caries (Rosenblatt & Zarzar, 2004). Modern Dentistry has been developing new concepts on early care and on health maintenance, contributing to the decrease in the prevalence of dental caries (da Silva *et al.*, 2013).

Caries can be prevented by perfect oral hygiene and sugar abstinence (Zimmer *et al.*, 2003). However, practice has shown that this approach is successful in individual cases only. For the whole population, effective caries prevention is still not realistic without the use of fluoride in various forms (Zimmer *et al.*).

Fluoride has been identified as one of the protective factors, which tilts the caries balance towards the positive side (Itthagarum *et al.*), and the use of fluoride by various means has been shown to be effective in preventing dental caries (Bian *et al.*, 2003) because the constant presence of low levels of fluoride in the mouth inhibits de-mineralization and enhances re-mineralization (Itthagarum *et al.*) also inhibiting bacterial growth (Jacobsen & Young, 2003).

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Remineralization involves the deposition of calcium phosphates from saliva to rebuild partly dissolved enamel crystallites (ten Cate, 2013). When fluoride is incorporated the dissolution of these reinforced crystallites will be reduced during a subsequent sugar-induced and bacteria-mediated acid attack (ten Cate).

The major cause of this reduction has been shown to be the introduction of systemic and topical fluorides, systemic being through use of water, milk or salt as vehicles, and topical mainly through the use of fluoridated toothpaste (Mulyani & McIntyret, 2002).

Oral health programs tend to concentrate on individual behavior change and largely ignore the influence of socio-political factors as the key determinants of health (Sheihamand & Watt, 2000). There is a close relationship between health level and cultural and socioeconomic disadvantage (da Silva *et al.*). Food policy development and the Health Promoting Schools initiative are used as examples of effective ways of promoting oral health (Sheiham & Watt). Oral health promotion which brings about the use of fluoride is effective for reducing caries (Kay & Locker, 1998).

Fluoride continues to be the cornerstone of any caries prevention program and is administered, in many regions of the world, by fluoridation of the water supply (Pratten *et al.*). Although water and toothpastes have been excellent vehicles for fluoride, there are parts of the world where drinking water cannot be fluoridated due to reasons such as the lack of resources, socio-economic and technical con-strains, absence of political will and national policy on oral health (Itthagaram *et al.*).

It was found that, for the Chilean situation, milk fluoridation is, at least, 1,000 times more economic than water fluoridation (Villa *et al.*, 1990).

The Swiss pediatrician Ziegler (1953) recommended that milk could be used as an alternative vehicle to deliver fluoride (Malinowski *et al.*, 2012). Milk is a good vehicle for providing fluoride to children, and fluoridated milk is technically easy to make (Bian *et al.*) and forms an important part of children's diets, having natural caries-protective and health-promoting components (Yeung *et al.*, 2005). Milk was one of the most important foodstuffs in the total energy consumption (Hinnig & Bergamaschi, 2012). The findings confirm that milk seem to be a suitable vehicle for fluoride administration (Engström *et al.*, 2006).

The slow fermentable lactose in milk is less cariogenic than sucrose, and the proteins and fats in milk may have a cariostatic effect too (Bian *et al.*). Fluoride added to milk does not change its taste and other characteristics (Bian *et al.*); and is well tolerated and safe from a toxic point of view (Engström *et al.*).

Milk as a common nutrient seems to play a complex role in in-vitro biofilm--enamel interactions stimulating bacterial demineralization on one hand, and, as effective fluoride carrier, inhibits caries-like demineralization (Arnold *et al.*, 2006). It was possible to verify an inhibition of enamel lesion formation by fluoridated milk already after 40 h of acid exposure and before any clearly visible clinical signs of demineralization were seen (Engström *et al.*).

Fluoridation of milk is recommended where fluoride concentration in the drinking water is suboptimal, caries experience is significant and programs to provide milk to children are in place (Itthagaram *et al.*) it was confirm that the earlier in the child's life the consumption of fluoridated milk starts, the better the effect (Ivanova *et al.*, 1995).

Dental caries and forms of prevention have been the subjects of many studies. Fluorinations of foods that are high-consumption as milk have been analyzed as prevention. The following paper consists of a systematic review about efficacy of milk fluoride prevention of dental caries in the children under 12 years old.

## MATERIAL AND METHOD

This is a systematic review with narrative analysis. It develops search strategies in all kinds of studies databases without language restrictions.

Types of participants. Children under 12 years old who had access to fluoridated milk and those who did not.

Types of interventions. Interventions that involved fluoridated milk compared to non-fluoridated administered to children under 12 years old to measure the tooth decay prevention incidence. The systemic fluoride (milk) works as a caries development controller (prevention), the effect of adding fluoride to milk distributed on supplement or public health programs and the effect of fluoridated milk in a bacterial biofilm

formation were also measured. Studies that did not meet this criterion are excluded.

The interventions that studied a different systemic fluoride to milk, risk for fluorosis, studies of components of milk, and the effect of breast milk to the teeth and dental caries and the analysis of the fluoride that the food contains were excluded.

**Types of measures outcomes:** a) Primary measures outcomes, b) Data on caries experience, c) Caries incidence, d) Concentration of ppm fluoride ion (mg/L) in solution as NaF and e) Caries increment. Secondary measures outcomes: a) Measures of general health.

**Search strategy for the identification of studies.** We searched the Cochrane Central Register of controlled trials (CENTRAL), Clinicaltrial.gov. An additional search was realized using a search strategy in MEDLINE route Pubmed (from 1998 until 2013), Lilacs (from 1998 until 2013), Ebsco (from 1998 until 2013), EMBASE (via OVID; 1998-2013), Science Citation Index (1998-2013), and Google scholar.

**Selection of the studies.** All references identified by the search strategy will be reviewed by two authors who independently will review and judge if the studies meet the inclusion criteria.

**Disagreements will be resolved by discussion.** If there is no agreement a third author will be prompted to settle those differences. Publications were excluded: a) without editorial board, b) diffusion magazines (organizational, laboratories, companies, etc.) c) conference abstracts. Scientific publications and analyzable methodology is privileged, and consistent with the objective of the research.

**Question of search:** What is the effectiveness of fluoridated milk compared with non-fluoridated milk in children under 12 years old to dental caries prevention?

The variables are analyzed according to the type of patient, methodological intervention comparison group, and outcome (Table I)

**Review Methods.** The review methods will be evaluated by two authors independently, focusing on search results and selection criteria. Researchers' criteria differences will be resolved by consensus among them. The Objective is: To determine the efficacy of fluoridated milk as a systemic prevention to prevent dental caries. The Type of studies is all kinds of studies that investigated the efficacy of fluoridated milk for dental caries prevention will be used. The excluded studies are those that: they had no clear methodology, showed conflicting results and presented ambiguous data, clear designs confusing or inadequate statistical data.

## RESULTS

The method of each study is analyzed in order to know the type of design used, then the type of statistician to establish the mathematical depth with which the research was conducted, whether there is a comparison group or not, the type of outcome related to the sample/universe, the type of patients and intervention made in each study, and also an additional result the adverse effects were evaluated (Table I)

The results of evidence are summarized in the following points:

- a) The milk fluoridation as an anti-caries measure, as they demonstrate that the addition of fluoride to milk increases the pH of the biofilms (Bian *et al.*).
- b) The milk fluoridation is a caries inhibitory effect (Kay & Locker).

Table I. Study variables.

Patients	Intervention	Comparison	Outcome
Pediatric patients under 12 years old.	The fluoride milk efficacy in the incidence of dental caries.	Incidence of dental caries between children who drink fluoridated milk from those who drink non fluoridated milk.	Incidence of dental caries (apparition of dental cavity).
Associated to the Search	Associated to the Search		Secondary outcome
---	Milk fluoridation	Milk	Dental caries
---	Milk fluoride	---	Childhood caries
---	Milk fluoro	---	---

c) No adverse effects reported in selected studies. The correct dose is important to prevent diseases like or fluorosis.

d) The effectiveness of fluoride in milk depends on: the promotion of oral health in caries, oral hygiene, oral health knowledge, attitudes and behaviors.

e) The mothers influence positively in the maintenance treatment of fluoridated milk (da Silva *et al.*)

The studies used observational designs. Studies focus on population-based epidemiological assessments that consider particular groups of subjects (mother - child), analyzing clinical treatments, education and adherence to treatment. Statistically, Research inferential statistics used to compare the results of fluoridated milk between groups or over time in one or more groups. This is used for testing in research such as ANOVA or T Student.

The structure of the research results show some development on the issue of fluoridated milk, lacking appropriate clinical trials for evaluation of efficacy. Evidence focuses on specific investigations of different quality and without adequate continuity to conduct a meta-analysis or some type of statistical analysis synthetic. The topic of fluoridated milk has contextualized information or methodology, in which the synthesis and critical analysis is fundamental to development is an overview of this topic.

## DISCUSSION

Knowledge acquisition is essential to improve oral health conditions (Prasai Dixit *et al.*). Caries, one of the most prevalent diseases of humans, results from the production of acids in bacterial biofilms (dental plaques) on the tooth surface which causes localized destruction of the teeth. The caries lesion results from the demineralization of tooth enamel by acid (Pratten *et al.*).

Caries preventive strategies in preschool children include diet modifications to reduce high frequency sugar consumption, supervised tooth brushing with fluoridated dentifrice, systemic fluoride supplements (Tinanoff *et al.*, 2002) like the application of fluoride varnish that is an excellent topical form for those patients who have access to dental care (Jacobsen & Young). However, considerable amount of school children had never been to a dentist nor had access to preventive hygiene practices (Prasai Dixit *et al.*).

Milk is an attractive vehicle for fluoride because it forms an important part of children's diets, having natural caries-protective (Yeung *et al.*), the consumption of milk will no doubt benefit the growth and development of young children. Therefore, by adding an appropriate amount of fluoride into the milk, simultaneous effects on dental caries prevention would be achieved (Bian *et al.*).

Trials in several countries have shown that children who participated in the fluoridated milk program experienced significantly less dental caries compared to children not on the program (Itthagarum *et al.*).

Fluoridated milk appears to have a protective effect on early enamel carious lesions (Itthagarum *et al.*). Studies have shown that fluoridated milk reduces the caries progression (Arnold *et al.*) and a clear dose-response benefit of fluoride in milk has been demonstrated for the prevention of demineralization of enamel under a cariogenic challenge in vitro (Malinowski *et al.*).

It was possible to verify an inhibition of enamel lesion formation by fluoridated milk already after 40 h of acid exposure and before any clearly visible clinical signs of demineralization were seen (Engström *et al.*) and it was demonstrated that the addition of fluoride to milk increases the pH of the biofilms (Pratten *et al.*).

Studies also confirm that the earlier in the child's life the consumption of fluoridated milk starts, the better the effect (Ivanova *et al.*) and showed that increasing the volume of fluoridated milk has little effect on its remineralizing efficacy (Itthagarum *et al.*).

As an adverse effect, Enamel fluorosis can occur following either an acute or chronic exposure to fluoride during tooth formation (Mulyani & McIntyret).

Recommendation: Caries is a disease that can be prevented with hygiene, regular visits to the dentist, avoiding a cariogenic diet, all this can be supplemented through systemic methods, especially in view of the fact that not all people have access to the dentist or an education of proper hygiene.

A systemic prevention method is fluoridated milk, which is an important part of the diet of children making it suitable, as it also has its own beneficial properties. Because it was found to be effective in the prevention of tooth decay, it would be worthwhile considering especially when there is a milk delivery system to families, as there is in Chile.

Table II. The systematic search is structured according to the following table.

Author	Method	Statistical type	Comparison group	Outcome type	Sample / Universe	Patient type	Intervention type
Ithaganun <i>et al.</i> (2011)	Third molars were painted leaving a 1 mm window on the buccal and/or lingual surfaces. Artificial carious lesions were induced using a demineralizing solution.	Descriptive statistics Randomly Paired t-test Analysis of variance (ANOVA) Tukey's test	15 groups according to different concentrations and volume of fluoride. De-ionized water and plain milk were used as controls.	Mean lesion depths decreased	15 groups According to different concentrations and volume; <i>i.e.</i> 2.5 ppm, 5 ppm, 7.5 ppm, 10 ppm, 15 ppm, 20 ppm, and 250 ppm of fluoride with 25 mL/section and 50 mL/section. De-ionized water and plain milk were used as controls.	Third molars with Artificial carious lesions	In vitro studies.
Pratten <i>et al.</i> (2000)	----	----	Biofilms of <i>Actinomyces spp.</i> , <i>Veillonella spp.</i> , <i>Streptococci</i> , <i>Lactobacillus spp.</i> and <i>Streptococcus mutans</i>	Support to the concept of milk fluoridation as an anticaries measure, as they demonstrate that the addition of fluoride to milk (i) increases the pH of the biofilms	<i>Actinomyces spp.</i> , <i>Veillonella spp.</i> , <i>Streptococci</i> , <i>Lactobacillus spp.</i> and <i>S mutans</i>	----	To use a biofilm-based model to determine the effects of fluoridation of milk on the cariogenic potential of dental plaque microcosms grown under conditions similar to those which would exist <i>in vivo</i> .
Bian <i>et al.</i> (2003)	All children in three selected kindergartens consumed 200 mL of fluoridated milk (concentration 2.5 mg per litre) per day	Software SPSS 8.0 for Windows	Children with and without access to fluoridated milk	Effect of fluoridated milk on caries in primary	417 children (227 girls, 190 Boys) and 247 children (116 girls, 131 boys) in the test and control groups, respectively.	Children in three selected kindergartens	200 mL of fluoridated milk (concentration 2.5 mg per litre) per day and a control group without access to fluoridated milk.
Mulyani & McIntyre (2002)	Trial used a double-blind Format.	ANOVA	Children using fluoridated sugar and those who used normal sugar. Urinary fluoride levels are recorded: there was no evidence of any unscheduled rise in background fluoride intake levels during the course of the trial	Caries inhibitory effect of fluoridated sugar	176 children who had at least 10 permanent teeth present, aged between seven and 19 living in two orphanages and a boarding facility for rural children from poor families.	Children who had at least 10 permanent teeth present, aged between seven and 19	5 to 40 ppm fluoride ion (or mg of fluoride per kilogram of sugar) resulted in acceptable levels of caries inhibition. Considering that the daily sugar intake per child was 60g, it was realized that consumption of 10ppm fluoride added to the sugar would result in the ingestion of 0.6 mg fluoride ion per day from that source.

Malinowski <i>et al.</i> (2012)	Enamel slabs (n= 11) with caries-like lesions were exposed to milk containing 6 different fluoride concentrations (0, 0.25, 0.5, 1.0, 5.0 and 10.0 ppm F). On each of the 14 days of the cycling period the lesions were exposed to five 2-minute periods of cariogenic challenge (1.5 mM acetic acid, 0.9 mM KH <sub>2</sub> PO <sub>4</sub> and 50 mM acetic acid at pH 5.0) and two 5-minute periods in milk plus 10 min in a milk/saliva (1:3) slurry. The slabs were stored at 37 °C in artificial saliva throughout the cycling period and demineralization and remineralisation was assessed by TMR using dedicated image software.	Shapiro-Wilk test SPSS for Windows	Fluoride groups and Non-fluoride control	The dose response of fluoride in milk on enamel demineralization and remineralisation under pH cycling using transverse microradiography (TMR).	10 slabs per group were required. Eleven enamel slabs with artificial caries-like lesions were used per group in case a slab was damaged during the study concentrations of F in milk were used: 0 ppm F (control), 0.25, 0.5, 1.0, 5.0 and 10.0 ppm F. Slabs were cycled for 14 days.	Enamel slabs (n= 11) with caries-like lesions	<i>In vitro</i> single blind study	---
Yeung <i>et al.</i> (2005)	----	Meta-analysis, x <sup>2</sup>	Fluoridated and non-fluoridated milk.	Drinking fluoridated milk help prevent dental caries in children	353 children, who had baseline ages of 3–5.5 years, were involved in the studies.	Children, between 3–5.5 years	---	---
Engström <i>et al.</i> (2006)	The teeth were exposed to a low-pH period by a 4-h period in either fluoridated (5 ppm, test) or nonfluoridated milk (control). The specimens were stored in pooled Human-stimulated whole saliva in room temperature. All teeth were examined by visual inspection with a magnifying glass and by LF readings (diagnodent)	Statistical Package for the Social Sciences software (version 12.0, Chicago, IL, USA). Aid of nonparametric Wilcoxon paired test. Weighed Cohen's kappa statistics.	Each tooth was hemisectioned in mesial–distal direction, and the buccal and lingual halves were and randomly designated in pairs as test or control samples	Effect of fluoridated milk on enamel lesion formation as assessed by laser fluorescence (LF).	18 extracted premolar teeth that were cut in mesial–distal direction and pairwise assigned to either test or control samples in an experimental caries model. The teeth were exposed to a low-ph 5 % cellulose gel for 4 h, 5 days per week immediately followed by a 4-h period in either fluoridated (5 ppm, test) or nonfluoridated milk (control).	Premolar teeth	<i>In vitro</i> study	---

Kay & Locker (1998)	---	Systematic review Meta-Analysis	---	The evidence of effectiveness of oral health promotion on caries, oral hygiene, oral health related knowledge, attitudes and behaviours Current understanding of the epidemiology mechanisms, and prevention of dental caries in preschool children	Only studies which reported an evaluative component were included.	Children, the elderly, adults and people with handicaps and disabilities	---
Tinanoff <i>et al.</i> (2002)	---	Journal Article; Review	---		---	Preschool children	---
Hinnig & Bergamasc hi (2012)	A list with all food intake and quantities, and the diet composition in relation to energy and macronutrients was calculated. The list was based on information provided by a 3-day-Food Diary completed by 85 schoolchildren ranging from seven to ten years old	Journal Article	---	To describe the most representative food items regarding the total intake of energy, carbohydrates, proteins and lipids in children with ages between 7 and 10 years.	Food Diary completed by 85 schoolchildren ranging from seven to ten years old and enrolled in a public school in São Paulo, Brazil.	Schoolchildren ranging from seven to ten years old and enrolled in a public school in São Paulo, Brazil	---
Sheiham & Watt (2000)	---	Review	---	Which oral health promotion and preventive approaches Dental workers should adopt.	---	---	---
Silva <i>et al.</i> (2013)	Mothers and their babies initially, semi-structured interviews on the level of mothers' knowledge as to their babies' oral health were conducted. Then, educational lectures were ministered and, after a year of follow-up, new interviews and clinical examination were performed.	Cohort study, Chi-square and Fisher exact tests	Mothers and their babies without educational lectures	To evaluate mothers who participated in an educational and preventive program for infants in relation to their knowledge on oral health practices	112 mothers and their babies aged 0 to 8 months and registered in the project "Promotion of Oral Health in Early Childhood" from the Federal University of Maranhão (Northeast Brazil).	Mothers and their babies and registered in the project "Promotion of Oral Health in Early Childhood" from the Federal University of Maranhão (Northeast Brazil).	---
Prasal <i>et al.</i> (2013)	Data was collected using a pretested questionnaire on 131 schoolchildren aged 8-16-year-olds attending Grade 3-5. Clinical examination was conducted on 361 School children aged 5-16-year-olds attending grade 1-5. Criteria set by the WHO (1997) was used for caries diagnosis. The questionnaires, originally constructed in English and translated into Nepali were administered to the schoolchildren by the researchers	A cross sectional epidemiological study. SPSS 11 software.	---	To 1) record the prevalence of dental caries 2) report experience of dental pain 3) evaluate knowledge, attitude and preventive practices on oral health of primary schoolchildren.	131 schoolchildren aged 8-16-year-olds attending Grade 3-5; and 361 school children aged 5-16-year-olds attending grade 1-5.	Indigenous Chepang school children of Nepal.	---

Zimmer <i>et al.</i> (2003)	Review	---	---	---	Recommendations for the Use of Fluoride in Caries Prevention	---	---	---	---
Jacobsen & Young (2013)	Review	---	---	---	Topical fluoride to prevent or reverse dental caries	---	---	---	---
Ten Cate (2013)	Article	---	---	---	Fluoride products in caries prevention That can be used by patients	---	---	---	---
Arnold <i>et al.</i> (2006)	Extracted impacted human molars were cut in half and covered with a varnish leaving a 4_4 mm window. The samples were coated with biofilm of <i>S. sobrinus</i> and were further divided into three experimental groups of <i>S. Sobrinus</i> , <i>S. Sobrinus</i> and milk and <i>S. Sobrinus</i> and fluoridated milk. As negative controls served teeth incubated in saline	Non-parametric Kruskal-Wallis test and the ANOVA test for repeated measurements. All calculations were carried out with SPSS 10.0 for Windows computer program	Milk group and fluoridated milk group	Effect of fluoridated milk in a bacterial biofilm – Enamel model	Five control tooth. Five tooth samples incubated with bacterial suspension of <i>S. sobrinus</i> , seven tooth samples incubated with bacterial suspension and whole milk and seven tooth samples incubated with bacterial suspension and fluoridated milk.	---	---	---	---
Rosenblatt & Z arazar (2004)	Visual clinical examination of teeth that had been previously cleaned with gauze. This was carried out under natural light in a waiting room. Four calibrated examiners performed the examination and the kappa test value was 8-0.	Chi-square (X <sup>2</sup> ) Test	Children from poor backgrounds in Recife compared with the world population as a whole.	To evaluate early childhood caries among 12-36-month-old children from families living in poor socioeconomic conditions in the city of Recife, Brazil	Some 468 children were included in this study. Their ages ranged from 12 to 36 months. The sample was comprised of 222 (47.4%) males and 246 females (52.6%).	---	---	---	An assessment
Ivanova <i>et al.</i> (1995)	Kindergartens where Fluoridated milk had been delivered on a regular basis has been to investigate the caries-reducing effect	---	Children from 3 to 10 years who received Fluoridated milk and children with natural fluoride content of its drinking water	To investigate the caries-reducing effect of a community-based Milk fluoridation project.	In each of the study groups, approximately 100 children (Equal sex distribution) were randomly selected for examination.	---	---	---	Controlled longitudinal clinical trial



Villa et al. (1990)	The biological and technical possibilities of adding fluoride (F) as monofluorophosphate (MFP) to milk were studied, together with a preliminary cost estimation for this procedure	Comparative Study	Milk fluoridation and water fluoridation.	To evaluate the efficacy of fluoridated milk as a cariostatic nutritional product	F ingestion by preschool children pertaining to the low and medium-low levels of population was estimated through polls and chemical analyses.
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**TORRES, E. M.; OLIVA, M. P. & LECANNELIER, B. C.** Eficacia de la leche fluorada en la prevención de caries dentales en niños menores de 12 años: Una revisión. *Int. J. Odontostomat.*, 10(2):197-206, 2016.

**RESUMEN:** La caries dental es la enfermedad común que se puede prevenir con una correcta higiene y el uso de fluoruro. La leche es una parte importante de la dieta de los niños, por ende, una buena opción como vehículo para entregar fluoruro. El objetivo fue determinar la eficacia de la leche fluorada para la prevención de la caries dental en niños menores de 12 años. Se realizó una revisión sistemática con análisis narrativo. Se desarrolló estrategias de búsqueda en bases de datos sin restricciones de idioma ni de diseño. Se generó una tabla general describiendo: autor, método, tipo estadístico, grupo de comparación, el tipo de resultado, muestra / universo, tipo de paciente, el tipo de intervención y los efectos adversos. Se demostró que la leche fluoruro es eficaz para prevenir la caries dental. La leche poseen elementos que impiden la caries dental, la adición de la cantidad apropiada de flúor aumentaría el efecto protector contra ello.

**PALABRAS CLAVE:** leche fluorada, caries dentales, leche no fluorada.

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Received: 18-01-2015  
Accepted: 03-06-2016